

Biological Assessment of

Packaging Corporation of America, Valdosta Operation

(formerly Tenneco Packaging, Inc.)

Hamilton County

NPDES #FL0000281

Sampled April 10, 2006

October 2006

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger:	Packaging Corporation of America, Valdosta Operation
Physical Address:	5495 Lake Park
County:	Lowndes County, Georgia; Hamilton County, Florida
NPDES Number:	FL0000281
Permit Expiration:	April 4, 2007

Toxics Sampling Inspection **(XSI)**

Date Sampled: April 10, 2006

Results: Aluminum was detected in the effluent sample. Iron and lead were found in the effluent at levels that complied with Class III Water Quality Criteria (62-302.530, F.A.C.) and facility permit limits. The metals arsenic, copper, nickel, and zinc were found in the effluent at levels above the method detection limits (MDL) and below the practical quantitation limits (PQL). Organic priority pollutants were not detected in the effluent. Metal concentrations in the Control and Test Site samples were very similar, with detections of aluminum, iron, and lead above the PQLs at levels that complied with Class III Water Quality Criteria (62-302.530, F.A.C.), and detections of arsenic, copper, and nickel between the MDLs and PQLs. Test Site sample concentrations did not appear to be elevated by the effluent.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: April 10, 2006

Results: The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during the 48-hour acute bioassays, at 15% effluent concentration. The facility permit requires a chronic toxicity test with 15% effluent concentration; however, only an acute test was conducted due to sampling logistics.

Water Quality Inspection **(WQI)**

Date Sampled: April 10, 2006

Results: Fecal and total coliforms were not sampled during this inspection. Effluent conductivity (2,000 µmhos/cm) exceeded the Class III Water Quality Criterion of 1,275 µmhos/cm (62-302.530(23), F.A.C.), but complied with the mixing zone permit limit of 3,300 µmhos/cm. Conductivity at the downstream Test Site (251 µmhos/cm) was notably higher than at the upstream Control Site (136 µmhos/cm). Downstream nutrient concentrations were only slightly elevated by effluent concentrations. Nitrate+nitrite concentrations in Control (0.58 mg/L) and Test (0.69 mg/L) Site samples ranked in the 80^{th} and 90^{th} percentile, respectively, of levels typical of Florida streams; however, these data were estimated. Orthophosphate concentrations in Control

(0.098 mg/L) and Test (0.11 mg/L) Site samples ranked in the 50th and 60th percentile, respectively, of levels typical of Florida streams. Algal growth potential (AGP) was above the "problem" threshold (5.0 mg dry wt/L) for effluent (6.3 mg dry wt/L), Control Site (27.5 mg dry wt/L), and Test Site (27.9 mg dry wt/L) samples. Effluent chlorophyll *a* (24.0 µg/L) was high, but chlorophyll *a* was not detected in Control or Test Site samples.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: April 10, 2006

Results: The community composition of periphyton on natural substrates did not differ between the Control and Test Sites. Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed a 14% lower Shannon-Weaver diversity, increased dominance of dipterans, and nearly twice as many individuals colonizing the samplers at the Test Site than at the Control Site. The Test and Control Sites had similar numbers of total taxa and EPT taxa. The Control Site SCI score of 44 placed it in the "Poor" category, whereas the Test Site SCI score of 57 placed it in the "Fair" category. The qualitative sampling showed that the two sites were quite similar in community composition and functional feeding groups, but the Test Site had more total taxa, and more Ephemeroptera, Clinger, and Sensitive Taxa. The habitat assessment scores did not differ between sites, so differences in SCI scores cannot be attributed to habitat.

Biological assessments are prepared by FDEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions.

Introduction

The Packaging Corporation of America, Valdosta Operation is located in Lowndes County, Georgia; the effluent discharge location is in Hamilton County, Florida (Appendix A). This facility is an industrial facility that produces unbleached Kraft liner board. Initial wastewater treatment includes mechanical and manual bar screens, primary clarifier, and associated sludge ponds for solids removal. Secondary treatment is accomplished in a series of seven ponds covering approximately 344 hectares (850 acres), with nutrient addition to the first and fourth ponds, and coagulant/precipitant at the discharge from pond 6 for incremental emergency color reduction. There are four anaerobic facultative ponds, followed by an aerated stabilization basin, a 142-hectare (350-acre) facultative impoundment, and a final polishing pond (pond 7) prior to a final effluent pumping station. Wastewater then flows through a concrete control structure with a mechanical bar screen, Parshall Flume, and a flow meter, into a final aeration basin. The effluent is pumped approximately 3.2 km (two miles) through a 1.2-m (48-inch) transmission pipe, through a submerged diffuser, and into the Class III fresh waters of the Withlacoochee River at outfall D-001, at the confluence with Jumping Gully Creek. The point of discharge is located approximately at latitude 30°37'21" N, longitude 83° 16'11" W (see Facility Summary in Appendix B). The design flow of the wastewater system is 14 million gallons per day (MGD); however, flow levels allowed by the permit are based on receiving water flow. The average monthly flow from April 2005 through March 2006 was 14.6 MGD. Effluent flow for the 28-day period preceding sampling (duration of Hester Dendy deployment) was 16.1 MGD, and the Withlacoochee River flow for that time period was 601 MGD. The effluent flow on the sampling date was 12.41 MGD, and the Withlacoochee River flow was 308 MGD (Facility information provided by James Lucas and Tom Kallemeyn of FDEP Northeast District).

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's monthly discharge monitoring reports, the plant had no violations in the 13 months prior to this inspection. In April 2005, they were not able to monitor upstream dissolved oxygen due to high water levels (Appendix B). The following mixing zones have been established for this facility: cadmium, 29.9 m (98 ft); specific conductance, 60.4 m (198 ft); copper, 96.9 m (318 ft); turbidity, 109.7 m (360 ft); oil and grease, 110.3 m (362 ft); unionized ammonia, 112.5 m (369 ft); dissolved oxygen, transparency, chronic toxicity, zinc, pH, lead, 356.9 m (1,171 ft).

Methods

The purpose of this investigation was to determine the potential effects of the facility's effluent on the biota of the receiving waters. Chemical and biological comparisons were made between a Control Site (located in the Withlacoochee River approximately 50 meters upstream of the discharge) and a Test Site (located in the Withlacoochee River approximately 360 meters downstream of the discharge, just beyond the largest mixing zone). Detailed methods and their relationship to Florida Administrative Code are given in Appendix C.

All field and laboratory biological methods followed Biology Section Standard Operating Procedures (SOPs, see http://www.floridadep.org/labs/qa/2002sops.htm for details) and met FDEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm). The toxicity tests were conducted with 15% effluent concentration because the facility's permit includes a mixing zone for chronic toxicity. However, an acute toxicity test was conducted rather than a chronic test due to the difficulty for District staff to travel to collect three samples for a chronic test, and the consistently good results for chronic tests of this effluent (NOEC = 100% since 2001, per Kim Pearce of DEP NE District).

The following were involved in this investigation: Tom Kallemeyn, Jeremy Parrish, James Lucas, and Reza Shayan (FDEP Northeast District), and FDEP Central Laboratory in Tallahassee. See Appendix D for the chain of custody form (sample submittal form). The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Shannan Bogdanov, and Michael Tanski).

Results and Discussion

- Specific chemical results are reported in Table 1 and a complete list of chemical analytes can be reviewed in Appendix E. Organic priority pollutants were not detected in the effluent. The oil and grease concentration in the effluent sample (8.6 mg/L) exceeded the Class III Water Quality Criterion of 5.0 mg/L (62-302.530(50a), F.A.C.), but was likely not an accurate result due to the detection of 8.1 mg/L oil and grease in the method blank (see Appendix E).
- Aluminum was detected in the effluent sample. Effluent metals iron and lead were found at levels that complied with Class III Water Quality Criteria (62-302.530, F.A.C.) and facility permit limits. The metals arsenic, copper, nickel, and zinc were found in the effluent at levels above the method detection limit (MDL) and below the practical quantitation limit (PQL).
- Metal concentrations in the Control and Test Site samples were very similar, and although most of the same metals were found at both receiving water sites as in the effluent, Test Site sample concentrations did not appear to be elevated by the effluent (Table 1).

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

Packaging Corporation of America	Class III Criteria	Effluent Limits	Effluent Samples	Control Site	Test Site
Organic Constituents (µg/L)					
None detected	-	-	-	-	-
Metals (µg/L unless otherwise noted)					
Aluminum	-	-	538	167	164
Arsenic	≤ 50	-	0.54 I	0.72 I	0.57 I
Cadmium	≤ 1.98 b	≤ 1.4	0.050 U	0.050 U	0.050 U
Calcium (mg/L)	-	-	48.2	26.4	27.1
Chromium	≤ 153.98 b	-	2.0 U	2.0 U	2.0 U
Copper	≤ 17.09 b	≤ 29.0	1.2 I	0.54 I	0.57 I
Iron	≤ 1000	-	136	727	683
Lead	≤ 7.84 b	≤ 9.6	0.35	0.35	0.32
Magnesium (mg/L)	-	-	20.1	4	4.4
Nickel	≤ 95.00 b	-	1.7 I	1.2 I	1.2 I
Selenium	≤ 5	-	0.50 U	0.50 U	0.50 U
Silver	≤ 0.07	-	0.025 U	0.025 U	0.025 U
Zinc	≤ 218.42 b	≤ 571	5.2 I	3.0 U	3.0 U
Nutrients (mg/L)					
Ortho-phosphate	-	-	0.51	0.098	0.11
Total Phosphorus	-	-	0.63	0.13 Y	0.13
Total Ammonia	-	Report	0.046 Y	0.020 AY	0.023 Y
Un-ionized Ammonia	≤ 0.02 s	≤ 0.134	≤ 0.02	≤ 0.02	≤ 0.02
Nitrate and Nitrite	-	-	0.51	0.58 Y	0.69 Y
Total Kjeldahl Nitrogen	-	-	1.2	0.37 Y	0.47
Organic Nitrogen	-	-	1.15 c	0.35 c	0.447 c
Total Nitrogen	-	Report	1.71 c	0.95 c	1.16 c
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	109	108
Dissolved Oxygen (mg/L)	≥ 5.0 s	>1.5	9.6	5.9	6.1
pH (SU)	6.0-8.5 s	6.0-9.0 s	7.4	7.0	7.2
Conductivity (µmhos/cm)	≤ 1275 s	≤ 3,300	2,000	136	251
Temperature (°C)	-	Report	22.9	20.4	20.8
Color (Pt-Co)	-	1291 c	200 A	50 *	50 *
Total Suspended Solids (mg/L)	-	-	4.0 U	2 K*	2 K*
Total Suspended Solids (lbs/day)	-	< 16,140 s	< 414 c	-	-
Turbidity (NTU)	≤ 32 t	≤ 80.0	9.6 A	3.0 *	3.5 *
Alkalinity (mg/L)	> 20	-	479	-	-
Residual Chlorine (mg/L; lab)	≤ 0.01	-	< 0.03	-	-
BOD, 5 day (mg/L)	-	-	4.8 A	2 K*	2 K*
BOD, 5 day (lbs/day)	-	< 12,869 s	497 c	-	-
Chlorophyll *a* (µg/L)	-	-	24 A	0.85 U	0.85 U
Phaeophytin (µg/L)	-	-	2.1 U	1.5 U	1.5 U
Oil and Grease (mg/L)	≤ 5.0	≤ 12.0	8.6 JV	-	-
Flow (MGD)	-	< 46.2 cf	12.41	-	-
Hardness (mg $CaCO_3$)	-	-	203.1	82.4	85.8
Toxicity (48-hour static screening bioassay, percent mortality in 15% effluent)					
Bioassay - Water flea	-	-	0%	-	-
Bioassay - Fish	-	-	5%	-	-

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness of the effluent
c - Value is calculated
f - 15% of receiving water flow for 4/10/06 (308 MGD)
s - Single sample
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
U - Material analyzed for but not detected; value reported is the method detection limit
V - Analyte was found in both sample and method blank
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
* - Analysis performed at the DEP Northeast District Lab

Aluminum was detected at both sites. Iron and lead were found at levels that complied with Class III Water Quality Criteria (62-302.530, F.A.C.). Arsenic, copper, and nickel were found at both sites at levels above the MDL and below the PQL.

- Effluent pH and dissolved oxygen complied with Class III Water Quality Criteria (62-302.530, F.A.C.) and facility permit limits. Effluent conductivity (2,000 µmhos/cm) exceeded the Class III Water Quality Criterion of 1,275 µmhos/cm (62-302.530(23), F.A.C.), but complied with the mixing zone permit limit of 3,300 µmhos/cm.

- Dissolved oxygen, pH and conductivity at the Control and Test Sites complied with Class III Water Quality Criteria (Table 1; 62-302.530, F.A.C.); however, conductivity levels were notably higher at the Test Site (251 µmhos/cm) than at the Control Site (136 µmhos/cm).

- The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi*, or to the water flea, *Ceriodaphnia dubia*, during 48-hour acute screening bioassays at 15% effluent concentration (See Table 1 for percent mortality, Appendix F for bioassay bench sheets, and Appendix G for supporting standard reference toxicant data). The facility permit requires a chronic toxicity test with 15% effluent concentration; however, only an acute test was run due to the difficulty for District staff to travel to collect three samples for a chronic test, and the consistently good results for chronic tests of this effluent (NOEC = 100% since 2001, per Kim Pearce of DEP NE District). While the 48-hour acute screening toxicity tests do not reflect the permit required conditions, the Department uses it to provide reasonable assurance that the facility does not adversely affect waters of the state.

- Fecal and total coliforms were not sampled during this investigation.

Table 2. Measured and predicted algal growth potential (AGP; mg dry weight/L) of the freshwater species *Pseudokirchneriella subcapitata* for total soluble nitrogen (TSIN) and total nitrogen (TN) limitation and ratios of nitrogen to phosphorus.

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	6.3	21.1 ± 4.2	65.0 ± 13.0	1.1	2.7
Control	27.5	22.8 ± 4.6	36.1 ± 7.2	6.1	7.3
Test	27.9	27.1 ± 5.4	44.1 ± 8.8	6.5	8.9

- The effluent total nitrogen concentration was 1.71 mg/L, and the effluent total phosphorus concentration was 0.63 mg/L (Table 1). Effluent ortho-phosphate (0.51 mg/L) and total Kjeldahl nitrogen concentrations (1.2 mg/L) contributed to slightly higher levels of these nutrients in Test Site samples than in Control Site samples (Table 1). Nitrate+nitrite concentrations in Control (0.58 mg/L) and Test (0.69 mg/L) Site samples ranked in the 80th and 90th percentile, respectively, of levels typical of Florida streams (Appendix H). Ortho-phosphate concentrations in Control (0.098 mg/L) and Test (0.11 mg/L) Site samples ranked in the 50th and 60th percentile, respectively, of levels typical of Florida streams. However, some results may not be accurate (see Table 1) because nutrient samples were left at improper temperatures in the lab after some analyses had been completed but prior to the completion of other analyses.
- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al*. 1978). Raschke and Shultz (1987) found that AGP above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP values of samples from the upstream Control Site and downstream Test Site were 27.5 and 27.9 mg dry wt/L, respectively, which were both above this threshold and close to the predicted values based on nutrient concentrations (Table 2). The AGP value of the effluent sample (6.3 mg dry wt/L) was also above this threshold, but more than three times lower than expected based on nutrient concentrations. It was especially surprising that the effluent AGP result was lower than expected because the chlorophyll-*a* concentration in the effluent was high (see below). Algal growth inhibition can only be determined by performing an actual algal growth inhibition test. Should algal growth inhibition be suspected, the District should request that the algal growth inhibition test be performed as a follow-up to the inspection. The AGP results do not suggest that the effluent is causing nutrient enrichment to the downstream Test Site.
- The chlorophyll-*a* concentration in the effluent sample was 24 µg/L, a high level which indicates that the effluent resides long enough in the settling ponds with sufficient nutrients and light for the development of a dense phytoplankton community. Residence time in this facility's holding ponds is approximately 6 weeks (information from James Lucas of the FDEP Northeast District). However, chlorophyll-*a* was not detected at the Control or Test Sites (Table 1). We note that nutrients in the water column may or may not fuel algal production immediately, depending upon the sum of environmental conditions that limit algal growth at the site (e.g. pH, shading, turbidity). Thus it is not necessarily contradictory for ambient nutrient levels to be high and for no chlorophyll to be detected in water samples.
- There were no differences in algal community composition between the Control and Test Sites (Table 3, Appendix J). The periphyton communities at both sites were dominated by *Melosira*, a genus of diatoms.
- Habitat assessment scores were 109 at the Control Site and 108 at the Test Site (Table 1, data sheets in Appendix I). The only difference between the two assessments was that there was slightly (one point) more smothering at the downstream Test Site; otherwise, the assessments were identical. This portion of the Withlacoochee River is approximately 36 m wide and 2 m deep, with fairly slow-moving waters (0.1 m/s) and habitats available and accessible only on the edges (Appendix I).

Table 3. Periphyton composition at control and test sites.

Packaging Corporation of America	Control Site	Test Site
Number of Taxa	56	51
Percent Dominant Taxon	17.9	19.8
Dominant Taxon (name)	*Melosira* sp.	*Melosira* sp.
Number of Algal Units Identified	313	313
Percentage Composition:		
Blue-green algae	6.8	2.9
Green algae	1.6	1.9
Diatoms	91.7	95.2

Table 4. Macroinvertebrate Hester-Dendy Samples - Quantitative

Packaging Corporation of America	Control Site	Test Site
Summary Statistics		
Shannon-Weaver Diversity	4.4	3.8
Number of Taxa	44	46
Florida Index	31	36
Number of EPT Taxa	11	10
Percent Dominant Taxon	14.5	31.4
Dominant Taxon (name)	*Rheotanyarsus exiguus* grp	*Corynoneura* sp.
Dominant Taxon (group)	Diptera	Diptera
Total Number of Individuals (counted)	489	908
Total Number of Individuals (#/m2)	973	1,805
Community Composition: Percent of total		
Coleoptera	6.7	0.4
Diptera	64.2	85.3
Ephemeroptera	9.8	5.1
Plecoptera	3.3	3.9
Trichoptera	14.5	4.5
Other	1.8	1.1
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0.0	0.1
Plant Piercers	5.2	1.3
Predators	11.6	4.9
Scavengers	2.3	0.0
Scrapers	9.7	3.8
Shredders	7.2	8.1
Surface Deposit Feeders	27.7	71.6
Suspension Feeders	24.1	10.2
Unknown	12.3	0.0

- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed slightly lower Shannon-Weaver diversity (4.4 at Control, 3.8 at Test), increased dominance of dipterans (64.2% at Control, 85.3% at Test), and nearly twice as many individuals colonizing the samplers at the Test Site than at the Control Site (Table 4, Appendix K). There was a community shift from a fairly balanced set of functional feeding groups at the Control Site to dominance of surface deposit feeders at the Test Site. However, both sites had a high number of taxa (44 at Control, 46 at Test) and EPT taxa (11 at Control, 10 at Test).
- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized in Tables 5 and 6 and in Appendix L. The Control Site SCI score of 44 placed it in the "Poor" category, two points shy of the "Fair" category, whereas the Test Site SCI score of 57 placed it in the "Fair" category. The two sites were quite similar in community composition and functional feeding groups, but the Test Site had more total taxa, and more Ephemeroptera, Clinger, and Sensitive Taxa (Table 5).

Summary

This inspection indicated that this facility's effluent complies with permit limits. Effluent conductivity complies with the permitted mixing zone limit, but does cause conductivity to increase at the Test Site compared to the Control Site. Although chlorophyll *a* was not detected at the Test Site, high chlorophyll *a* in the effluent could impact downstream sites if other receiving water conditions changed. Qualitative and quantitative macroinvertebrate sampling upstream and downstream of the effluent yielded mixed results; the Hester-Dendy sampling suggested slight enrichment at the downstream site, whereas qualitative sampling yielded a lower Stream Condition Index (SCI) score at the Control Site than at the Test Site. Inspections at this facility in 1998 and 2000 also yielded mixed results for the macroinvertebrate community (FDEP 1999, 2001). In both inspections, as in the current one, Hester-Dendy samplers contained more taxa and more Florida Index taxa at the Test Site than at the Control Site. However, SCI results have been mixed. In December 1998, SCI scores were the same for both the Control and Test Sites, with both sites in the "excellent" category. In June 2000, the Control Site scored in the "excellent" category for the SCI, whereas the Test Site scored in the "poor" category. In 2000, the results were attributed to more habitat smothering at the Test Site. In the current inspection, the Test Site scored in the "fair" category, whereas the Control Site scored in the "poor" category for the SCI. These fluctuations in results may be due to higher variability in habitat accessibility in a large river such as the Withlacoochee. The current inspection indicates that the effluent is not degrading the downstream macroinvertebrate community of the receiving waters.

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Table 5. Macroinvertebrate Dipnet Samples - Qualitative

Packaging Corporation of America	Control Site	Test Site
Stream Condition Index (value)	44	57
Stream Condition Index (word)	Poor	Fair
Stream Condition Index Metrics		
Number of Total Taxa	35	46
Number of Ephemeroptera Taxa	1	6
Number of Trichoptera Taxa	3	3
Number of Clinger Taxa	2	5
Number of Long-lived Taxa	3	3
Number of Sensitive Taxa	2	6
Percent of Dominant Taxon	12.0	15.8
Percent Suspension Feeders and Filterers	7.5	5.9
Percent of Tanytarsini individuals	4	4
Percent of Very Tolerant individuals	8	18.8
Total Number of Individuals	100	101
Community Composition: Percent of total		
Dominant Taxon (name)	*Microcylloepus pusillus*	*Hyalella azteca*
Dominant Taxon (group)	Coleoptera	Amphipoda
Acariformes	14.0	3.0
Amphipoda	10.0	15.8
Coleoptera	17.0	6.9
Decapoda	4.0	5.0
Diptera	26.0	30.7
Ephemeroptera	1.0	7.9
Gastropoda	7.0	8.9
Isopoda	2.0	2.0
Odonata	2.0	0.0
Oligochaeta	2.0	5.9
Pelecypoda	7.0	4.0
Trichoptera	7.0	7.9
Other	1.0	2.0
Functional Feeding Groups: Percent of total		
Browsers-Grazers	0	2.5
Burrowing Deposit Feeders	2.0	5.9
Plant Piercers	1.0	1.0
Predators	11.0	9.4
Scavengers	4.0	4.5
Scrapers	14.5	21.3
Shredders	12.0	16.3
Surface Deposit Feeders	34.0	31.2
Suspension Feeders and Filterers	7.5	5.9
Unknown	12.0	2.0

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Table 6a. Stream Condition Index Metrics - Panhandle Bioregion

Packaging Corporation of America			**Control Site**
Metric:	Value	Raw Metric Score	Fixed Score 0 -10
Total Number of Taxa	35	5.8	5.8
Number of Ephemeroptera Taxa	1	1.7	1.7
Number of Trichoptera Taxa	3	4.3	4.3
Number of Clinger Taxa	2	1.3	1.3
Number of Long-lived Taxa	3	6.0	6.0
Number of Sensitive Taxa	2	1.1	1.1
Percent Contribution of Dominant Taxon	12	9.4	9.4
Percent Suspension Feeders and Filterers	7.5	1.5	1.5
Percent of Tanytarsini individuals	4	4.9	4.9
Percent of Very Tolerant individuals	8	3.9	3.9
Total Score			**44**
Interpretation of Scores		Good	73-100
		Fair	46-72
		Poor	19-45
		Very Poor	0-18

Table 6b. Stream Condition Index Metrics - Panhandle Bioregion

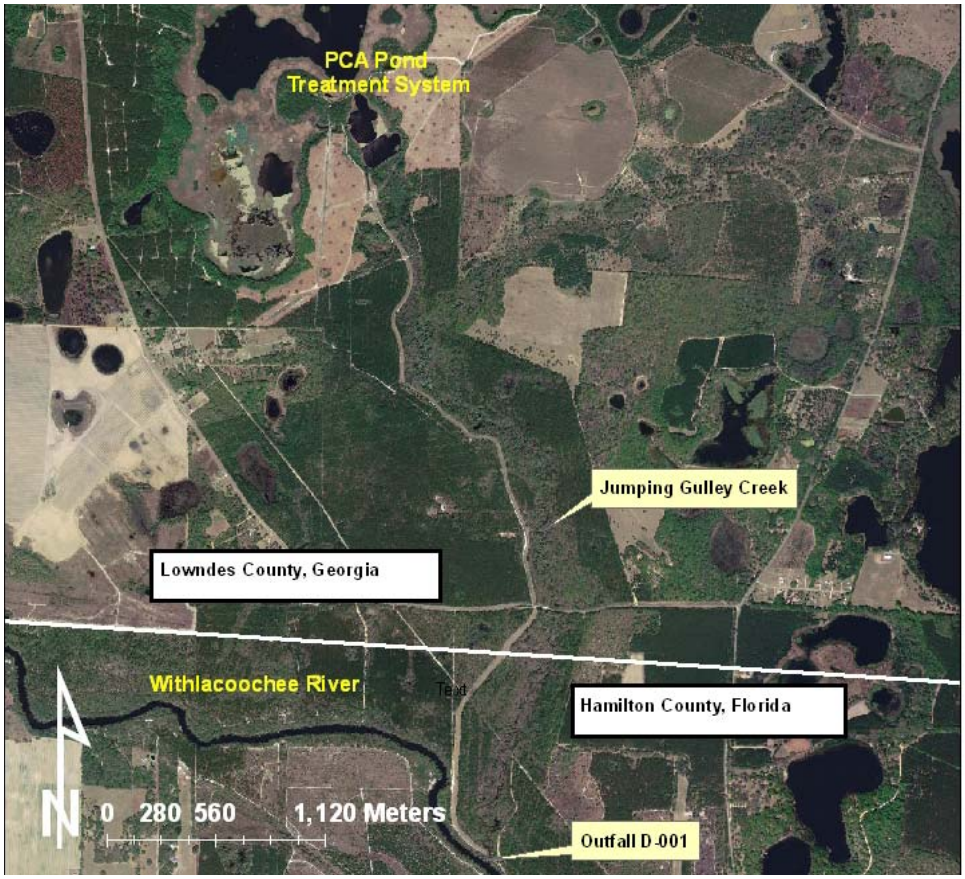
Packaging Corporation of America			**Test Site**
Metric:	Value	Raw Metric Score	Fixed Score 0 -10
Total Number of Taxa	46	9.1	9.1
Number of Ephemeroptera Taxa	6	10.0	10.0
Number of Trichoptera Taxa	3	4.3	4.3
Number of Clinger Taxa	5	3.2	3.2
Number of Long-lived Taxa	3	6.0	6.0
Number of Sensitive Taxa	6	3.2	3.2
Percent Contribution of Dominant Taxon	15.8	8.2	8.2
Percent Suspension Feeders and Filterers	5.94	1.1	1.1
Percent of Tanytarsini individuals	3.96	4.9	4.9
Percent of Very Tolerant individuals	18.81	1.7	1.7
Total Score			**57**
Interpretation of Scores		Good	73-100
		Fair	46-72
		Poor	19-45
		Very Poor	0-18

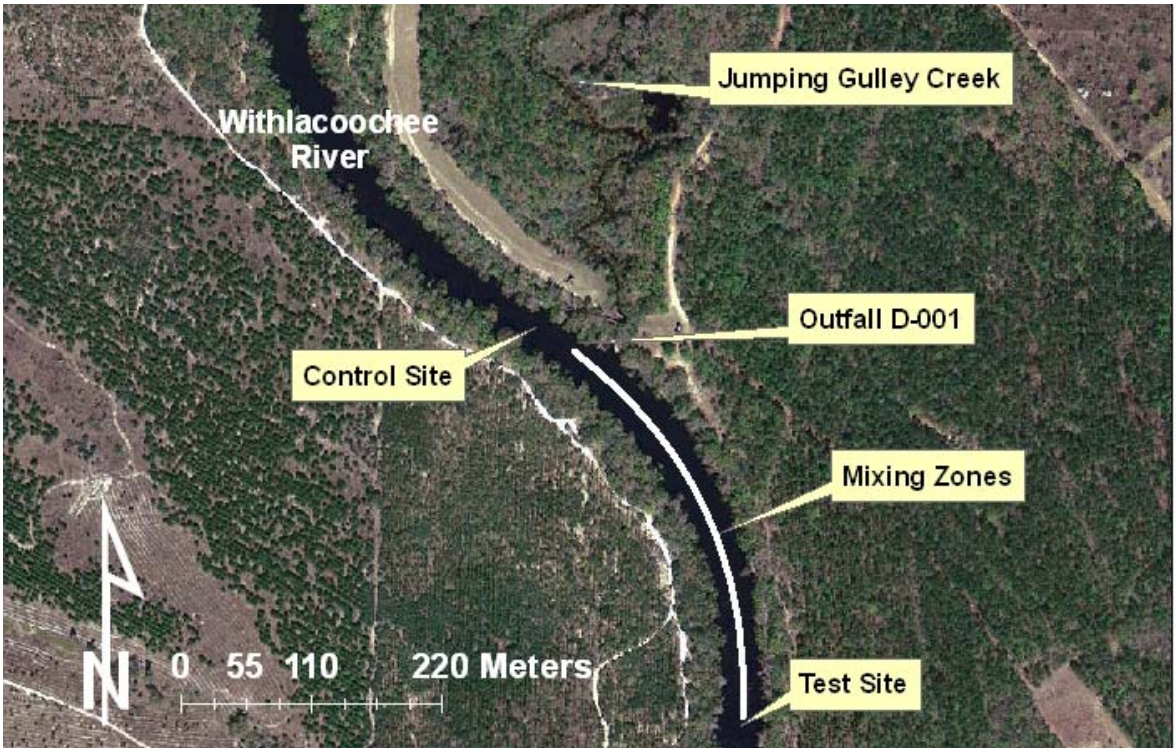
Appendices

- Appendix A. Map of facility
- Appendix B. Facility summary and DMR data
- Appendix C. Explanation of measurements
- Appendix D. Chain of Custody form
- Appendix E. Chemical analyses of effluent and receiving water.
- Appendix F. Additional physical, chemical, toxicological and microbiological results
- Appendix G. Standard Reference Toxicant test data
- Appendix H. Typical values for selected parameters in Florida waters
- Appendix I. Habitat Assessment field sheets
- Appendix J. Periphyton: Taxa list and number of individuals counted
- Appendix K1. Hester-Dendy multi-plate samplers: Taxa list and macroinvertebrate density (average number of individuals per m^2)
- Appendix K2. Hester-Dendy multi-plate samplers: Taxa list and total number of macroinvertebrates counted
- Appendix L1. Dipnet samples: Taxa list and number of macroinvertebrates counted (collapsed)
- Appendix L2. Dipnet samples: Taxa list and number of macroinvertebrates counted

Appendix A

Map of Facility





Appendix B

State of Florida
Department of Environmental Protection
Facility Introduction

Things to include in the introduction:

- **Type of facility**
- **Former names**
- **Design flow**
- **Average flow (with dates of time period flow was measured)**
- **Description of the treatment process**
- **Chlorination/dechlorination methods (if applicable)**
- **Receiving water and classification (i.e. Class III fresh waters of the St. John's River)**
- **If mixing zone is present and for what. If several, list all.**
- **Sampling location, specify lat/longs of NPDES point and/or effluent collection point**
- **Any other information about the facility or the effluent that is relevant to the effluent samples. (i.e. recent violations, unusual discharge location, combined effluent with another facility, reason bioassay sample may be chlorinated, etc.)**

TEXT:

The Packaging Corporation of America (PCA) mill (formerly Tenneco Packaging) is an unbleached kraft liner board production facility. The facility is authorized for a 14 MGD average (design) industrial wastewater treatment system. The current monthly average flow from October 2004 to March 2006 is approximately 14.6 MGD.

Treatment consists of a mechanical bar screen at the influent to the wastewater lift station prior to the primary clarifier, a manual bar screen for the auxiliary wastewater lift station bypass line, and a back-up manual bar screen in the channel downstream from the mechanical bar screen. The manual bar screen on the auxiliary line and back-up manual bar screen minimizes the need for the clarifier to be shutdown due to mechanical bar screen outages. The wastewater lift station pumps wastewater consisting of process and non-process wastewater from the mill manufacturing operations, and storm water to a primary clarifier and associated sludge ponds for treatment for settleable solids removal. Secondary treatment is accomplished in a series of seven ponds covering approximately 850 acres, with nutrient addition to the first and fourth ponds, and coagulant/precipitant at the discharge from pond 6 for incremental emergency color reduction. There are four anaerobic facultative ponds, followed by an aerated stabilization basin, a 350 acre facultative impoundment, and a final polishing pond (pond 7), prior to a final effluent pumping station and associated conveyance system which discharges final treated effluent from outfall D-001 to the Withlacoochee River, a class III fresh surface water of the state. The point of discharge is located approximately at latitude 30°37'21" N, longitude 83°16'11" W. The sampling location SWU-1 (formerly Station 001-C) in the Withlacoochee River, is located approximately 100 feet up stream (north) of outfall D-001(located near the confluence of Jumping Gully Creek and the Withlacoochee River). Streamside samples will be taken from the east riverbank, approximately four to five feet out from the water's edge. The sampling location SWD-1 (formerly Station 001-D) is located in the Withlacoochee River, near Florida Highway 150 Bridge. Streamside samples will be taken approximately four to five feet out from the water's edge or mid-river from the bridge, as appropriate.

Mixing zones have been established for the following parameters:, Dissolved Oxygen 1,171 ft., Specific Conductance 198 ft,
Cadmium 98 ft., Copper 318 ft., Zinc 1,171 ft.,
Oil & Grease 362 ft., Toxicity 1,171 ft., pH 1,171 ft.,
Turbidity 360 ft., Unionized Ammonia 369 ft., Lead 1,171 ft.
Transparency 1,171 ft.

One abnormal event has been reported in the past year. In April 2005, the facility was unable to collect the upstream DO sample due to elevated stream conditions. As required by the permit, the permittee is conducting a bioassessment plan of study in years 1, 3 and 5 of the permit to include qualitative bioassessment sampling and concurrent in stream sampling.

Facility Summary

Facility Name (as it appears on permit): Packaging Corporation of America, Valdosta Operation		**Former Names:** Tenneco Packaging, Inc.
Physical Address: 5495 Lake Park Lowndes County, Georgia	**NPDES Permit No.:** FL0000281 **Expiration Date:** April 4, 2007	**Prepared By:** James Lucas
County: Hamilton **District:** NED	**State Permit No.:** **Expiration Date:**	**Facility Type:** Industrial
Function of Facility: Unbleached Kraft Liner Board		
Sampling Location (specify lat/longs of NPDES point): latitude 30°37'21" N, longitude 83°16'11" W		
Description of treatment process: Treatment consists of a mechanical bar screen at the influent to the wastewater lift station prior to the primary clarifier, a manual bar screen for the auxiliary wastewater lift station bypass line, and a back-up manual bar screen in the channel downstream from the mechanical bar screen. The manual bar screen on the auxiliary line and back-up manual bar screen minimizes the need for the clarifier to be shutdown due to mechanical bar screen outages. The wastewater lift station pumps wastewater consisting of process and non-process wastewater from the mill manufacturing operations, and storm water to a primary clarifier and associated sludge ponds for treatment for settleable solids removal. Secondary treatment is accomplished in a series of seven ponds covering approximately 850 acres, with nutrient addition to the first and fourth ponds, and coagulant/precipitant at the discharge from pond 6 for incremental emergency color reduction. There are four anaerobic facultative ponds, followed by an aerated stabilization basin, a 350 acre facultative impoundment, and a final polishing pond (pond 7), prior to a final effluent pumping station and associated conveyance system which discharges final treated effluent from outfall D-001 to the Withlacoochee River, a class III fresh surface water of the state.		
Receiving Waters: Withlacoochee River		**Classification:** Class III - Fresh

Temperature (C): 22.92	**Design Flow:** 14.0 MGD average
pH (SU): 7.39	**Mean Flow:** 14.6 MGD
Conductivity (umhos/cm): 2,000	**Flow During Survey:** 12.41 MGD
Dissolved Oxygen (mg/L): 9.6 (112.1 %)	**Total Residual Chlorine (mg/L):**

Discharge is: **X Continuous** **Intermittent** **Seasonal** **Rainfall Dependent** **Other**

Facility Mixing Zone Details:

Dissolved Oxygen	1,171 ft.
Specific Conductance	198 ft.
Cadmium	98 ft.
Copper	318 ft.
Zinc	1,171 ft.
Oil & Grease	362 ft.
Toxicity	1,171 ft.
pH	1,171 ft.
Turbidity	360 ft.
Unionized Ammonia	369 ft.
Lead	1,171 ft.
Transparency	1,171 ft.

List Effluent Limits:

Parameter and Units	Limit	Describe special permit conditions and permit modifications:
Flow (MGD)	< 15% RWC	RWC (Receiving Water Concentration) is the percent effluent in the receiving water. The RWC is calculated by the average daily effluent flow divided by the daily receiving water flow downstream from the outfall at the confluence with Jumping Gully Creek.
BOD_5 (lbs./day)	Monthly Average <6,434 lbs/day Daily Maximum <12,869 lbs/day Annual Average <5,550 lbs/day	*The maximum allowable loading of BOD_5 (lb/day) in any one day shall not exceed 12.0 lb/day for each cfs of river flow. *If the upstream dissolved oxygen is less than 4.6 mg/l, then the following loading shall apply to BOD_5. Upstream D.O. (mg/l) / Loading lb/day/river cfs 4.5 — 10 4.4 — 8 4.3 — 6 4.2 — 4 <4.1 — 2 Effluent BOD_5, upstream flow, BOD_5 lb/day/cfs and appropriate BOD_5 / cfs limits shall be tabulated for each month and submitted with the monthly MOR.
Total Suspended Solids (lbs./day)	Monthly Average <10,760 Daily Maximum <16,140	
pH (S.U.)	Daily Minimum 6.0 Daily Maximum 9.0	
Specific Conductance (umhos/cm)	Daily Maximum 3,300	
Temperature (°F)	Daily Maximum Report	

Total Nitrogen as N (mg/L)	Daily Maximum Report	
Total Ammonia as N (mg/L)	Daily Maximum Report	
Ammonia as N (unionized)(mg/l)	Daily Maximum .134	
Color (True) (PCU)	Variable	The discharge shall not cause greater than 50 color unit (PCU) in crease from natural background conditions: The maximum allowable effluent color limit is to be calculated as follows:
Oil and Grease (mg/l)	Daily Maximum 12.0	Ce = (50/RWC)+Cu
Turbidity (NTU)	Daily Maximum 80	
Cadmium (ug/L)	Daily Maximum 1.4	
Copper (ug/l)	Daily Maximum 29.0	
Dissolved Oxygen (mg/l)	Daily Maximum >1.5	
Lead (ug/l)	Daily Maximum 9.6	
Zinc (ug/l)	Daily Maximum 571	
Chronic Toxicity		15% effluent for daphnid (Ceriodaphnia dubia) Survival and Reproductive Test and a short-term fathead minnow (Pinephales Promelas) Lrval Survival and Growth Test.

Description of permitted outfall: Wastewater flows through a concrete control structure with a mechanical bar screen, Parshall Flume, and a flow meter, into a final aeration basin. The effluent is pumped approximately two miles through a 48-inch transmission pipe, through a submerged diffuser, and into the Withlacoochee River at the confluence with Jumping Gully Creek
List permit violations (DMR data) and plant upsets that occurred at the plant within the last year: One abnormal event has been reported in the past year. In April 2005, the facility was unable to collect the upstream DO sample due to elevated stream conditions.
Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions: As required by the permit, the permittee is conducting a bioassessment plan of study in years 1, 3 and 5 of the permit to include qualitative bioassessment sampling and concurrent in stream sampling.
Discuss MOR trends to prior data; is trend improving or declining: Trends appear to be seasonal and dependent upon the receiving water depth. Ex. Low dissolved oxygen levels under low flow conditions.
Additional Information:

Appendix C

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.floridadep.org/labs/sop/index.htm and/or http://www.floridadep.org/labs/qa/index.htm .

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. A list of the analytes tested for, results, data qualifiers, the minimum detection limit and the practical quantitation limit are given in Appendix D. The results from these analyses were compared with Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1, Appendix B). Exceedances of Water Quality Criteria may be violations of specific provisions of Chapter 62-302 (F.A.C.) and/ or facility permit limits.

(3) Toxicity Bioassays

Acute screening toxicity bioassays were performed on the effluent sample using the water flea, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* following FDEP SOPs TA07_01 and TA07_02. Failure of toxicity testing may constitute a violation of 62-302.520(21), 62-302.530(62) and/or facility permit limits. Standard reference toxicant tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

The effluent and water from control and test sites were analyzed for the presence and concentration of total and fecal coliform bacteria following FDEP SOPs MB1_0 and MB1_1. High levels of fecal or total coliform bacteria may constitute violation of 62-302.530(6), 62-302.530(7) and/or facility permit limits.

(5) Habitat Assessment

Habitat assessment is used to evaluate the physical structure and extent of disturbance in a waterbody. Eight aspects are ranked, with 20 possible points for each aspect (QA Rule SOP FT 3100). The Habitat Assessment score includes types and amounts of benthic substrates, water velocity, amount of sand or silt accumulation, extent of artificial channelization, bank stability, and riparian zone width and vegetation type. All scores are summed to yield an overall Habitat Assessment score. Habitat Assessment score ranges from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).

(6) Algal Growth Potential (AGP)

The effluent and water from control and test sites are autoclaved, filtered (0.45μm), inoculated with the unicellular green alga, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum,* USEPA 2002*),* and incubated for 14 days (FDEP SOP TA08_05). The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Raschke and Shultz (1987) found that an AGP above 5.0 mg dry weight/L represents a "problem" threshold for fresh receiving waters, implying nutrient enrichment. High AGP values may constitute one line of evidence for violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of ± 20%. When the ratio of nitrogen to phosphorus (N: P) is less than 10:1, nitrogen limitation of algal production is likely. When the N: P ratio is 20:1 or greater, phosphorus limitation is likely (USEPA 2000). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may be a violation of 62-302.530(62) F.A.C..

(7) Algal Phytoplankton and Periphyton Assemblages

Methods: Qualitative periphyton were sampled at both control and test sites by taking subsamples of algae from natural substrates throughout the sample reach (QA Rule FS7220). Phytoplankton were sampled using a 1 L grab sample (QA Rule SOP FS7100). Periphyton were subsampled and identified to the lowest practical level, usually species (FDEP SOPs AB03, AB03_1 and AB05).

Chlorophyll *a* Content: Chlorophyll *a* content is measured in phytoplankton samples to estimate algal biomass (FDEP SOP BB05). High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be a violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples and number of natural units/cm^2 for periphyton samples. Although algal density of a single site is highly variable and depends on a number of factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Extreme nutrient enrichment tends to reduce the number of different types of algae present in a sample because a few tolerant taxa tend to reproduce rapidly and constitute the majority of the cells present. However, moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999) as the algal community begins to respond to the increased input of nutrients.

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

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

(8) Benthic Macroinvertebrate Assemblages

Methods: Benthic macroinvertebrates were collected using two methods. Quantitative samples were collected from Hester-Dendy multi-plate samplers incubated for 28 days (QA Rule SOP FS7430). Qualitative collections are made using 20 dipnet sweeps (QA Rule SOP FS7420). Benthic macroinvertebrates were sorted and identified to the lowest practical taxonomic level, usually species (FDEP SOP IZ06).

Taxa richness: Taxa richness is the number of distinct macroinvertebrate taxa present in a sample. Stress, habitat destruction and pollution tend to reduce the number of different types of organisms present (Karr and Chu 1998). Decreases in taxa richness related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

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

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

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

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

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric developed for Florida. This Index was revised in 2004 using data from qualitative dipnet samples. The SCI now assigns points to ten parameters; depending

on how closely each parameter approaches an expected value (QA Rule SOP LT 7200). Points are assigned depending on which bioregion (Panhandle, Northeast, or Peninsula) the sampling location exists in and summed to yield a final SCI score (range 0-100). Included in the calculation of SCI are taxa richness, number of Ephemeroptera taxa, number of Trichoptera taxa, percent contribution of the dominant taxon, number of sensitive taxa, number of clinger taxa, number of long-lived taxa, percent contribution of Tanytarsini, percent contribution of very tolerant, and the percent contribution of suspension and filter feeders. Scores are broken into four ordinal groups: Good, Fair, Poor, and Very Poor. A decrease in ordinal SCI score from the Control to the Test site may be evidence of degradation related to a facility's effluent. An SCI score of "Poor" or "Very Poor" related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

(9) Statistical Comparisons

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

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2006-04-10-18
Packaging Corporation of America fka Teneco Packaging

Event ID *

Requester: Shannan Bogdanov

Field Report Prepared By: James Lucas/Reza Shaya

Customer: NE-DIST

Collected By: James Lucas/Reza Shayan

Send Final Report To Melissa Long

Project ID: FYI5

Sampling Agency: FDEP NE District

PMAS: 1163

Lab ID *	Location: PCA, effluent, Hamilton Co.		☐ Comp ☑ Grab	Collection (begin) Date 04/10/06 Time 14:46 ☑ Eastern ☐ Central	Collection (end) Date 4/10/06 Time 1450 ☐ Eastern ☐ Central			Bottle Group(s)**	
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 9.6 (112.1%)	Storet Station Number			
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C) 22.92	pH 7.39	Sample Depth ☑ m ☐ ft 1.2	☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm) 1.02 2,000	NPDES Number			1
	Latitude o ' "	Longitude o ' "		Comments Flow = 12.41 MGD					
Lab ID *	Location: Blank		☐ Comp ☐ Grab	Collection (begin) Date Time ☐ Eastern ☐ Central	Collection (end) Date Time ☐ Eastern ☐ Central			Bottle Group(s)**	
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number			
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number			5
	Latitude o ' "	Longitude o ' "		Comments					
Lab ID *	Location		☐ Comp ☐ Grab	Collection (begin) Date Time ☐ Eastern ☐ Central	Collection (end) Date Time ☐ Eastern ☐ Central			Bottle Group(s)**	
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number			
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number			
	Latitude o ' "	Longitude o ' "		Comments					
Lab ID *	Location		☐ Comp ☐ Grab	Collection (begin) Date Time ☐ Eastern ☐ Central	Collection (end) Date Time ☐ Eastern ☐ Central			Bottle Group(s)**	
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number			
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number			
	Latitude o ' "	Longitude o ' "		Comments					

Relinquished By:	Date/Time	Shipping Method:	Received By: LFU	Date/Time 4-11-06 1100A	Relinquished By:	Date/Time	Received By: DK	Date/Time 4.11.06 9:00 am

TR Chester Derdys 9:55AM

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

KE 4/10/06 2 HDs

last revised October 1, 2003

2 ACP 1343 4-11-06

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2006-02-13-12
SUWLB2

Event ID *

Requester: Lee Banks

Field Report Prepared By: Tom Kallemeyn

Customer: NE-DIST

Collected By: Jeremy Parrish

Send Final Report To Lee Banks

Project ID: SMP

Sampling Agency:

PMAS:

Lab ID *	Location: Withlacoochee River Above PCA	☐ Comp ☒ Grab	Collection (begin) Date 4/10/06 Time 11:15 Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID: Control		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 5.9	Storet Station Number	B
	Matrix (Include type e.g. Salt, Fresh, etc): fresh	Temp (C): 20.4	pH: 7.03	Sample Depth: 0.4 ☒ m ☐ ft	186 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			
Lab ID *	Location: Withlacoochee River Below PCA	☐ Comp ☒ Grab	Collection (begin) Date 4/10/06 Time 1305 ~~Eastern~~ Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID: Test		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 6.06	Storet Station Number	B
	Matrix (Include type e.g. Salt, Fresh, etc): fresh	Temp (C): 20.8	pH: 7.18	Sample Depth: 0.5 ☒ m ☐ ft	251 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			
Lab ID *	Location	☐ Comp ☐ Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			
Lab ID *	Location	☐ Comp ☐ Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Kallemeyn	4/10/06 17:10	DHL					SK	4.11.06 9:00

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

2 AHP 1.3/8 SW 4-11-06

Appendix E

Chemical analysis of effluent and receiving water

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	BLANK	BNA-Water	1,2,4-Trichlorobenzene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	1,2-Dichlorobenzene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	1,3-Dichlorobenzene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	1,4-Dichlorobenzene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2,4,6-Trichlorophenol	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2,4-Dichlorophenol	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2,4-Dimethylphenol	57	ug/L	U	57	230
4/10/2006	BLANK	BNA-Water	2,4-Dinitrophenol	17	ug/L	U	17	68
4/10/2006	BLANK	BNA-Water	2,4-Dinitrotoluene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2,6-Dinitrotoluene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2-Chloronaphthalene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2-Chlorophenol	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	3.4	ug/L	U	3.4	14
4/10/2006	BLANK	BNA-Water	2-Nitrophenol	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	3,3'-Dichlorobenzidine	45	ug/L	U	45	180
4/10/2006	BLANK	BNA-Water	4,4'-DDD	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	4,4'-DDE	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	4,4'-DDT	1.7	ug/L	UJ	1.7	6.8
4/10/2006	BLANK	BNA-Water	4-Bromophenyl phenyl ether	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	4-Chloro-3-methylphenol	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	4-Chlorophenyl phenyl ether	2.3	ug/L	U	2.3	9.1
4/10/2006	BLANK	BNA-Water	4-Nitrophenol	17	ug/L	U	17	68
4/10/2006	BLANK	BNA-Water	Acenaphthene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Acenaphthylene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Aldrin	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	Anthracene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Benzidine	110	ug/L	U	110	450
4/10/2006	BLANK	BNA-Water	Benzo(a)anthracene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Benzo(a)pyrene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Benzo(b)fluoranthene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Benzo(g,h,i)perylene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Benzo(k)fluoranthene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Bis(2-chloroethoxy)methane	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Bis(2-chloroethyl)ether	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	3.4	ug/L	U	3.4	14
4/10/2006	BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	17	ug/L	U	17	68
4/10/2006	BLANK	BNA-Water	Butyl benzyl phthalate	5.7	ug/L	U	5.7	23
4/10/2006	BLANK	BNA-Water	Chrysene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Di-n-butyl phthalate	5.7	ug/L	U	5.7	23

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	BLANK	BNA-Water	Di-n-octyl phthalate	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Dibenzo(a,h)anthracene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Dieldrin	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	Diethyl phthalate	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Dimethyl phthalate	57	ug/L	U	57	230
4/10/2006	BLANK	BNA-Water	Endosulfan I	4.5	ug/L	U	4.5	18
4/10/2006	BLANK	BNA-Water	Endosulfan II	4.5	ug/L	U	4.5	18
4/10/2006	BLANK	BNA-Water	Endosulfan sulfate	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	Endrin	1.7	ug/L	UJ	1.7	6.8
4/10/2006	BLANK	BNA-Water	Endrin aldehyde	4.5	ug/L	U	4.5	18
4/10/2006	BLANK	BNA-Water	Fluoranthene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Fluorene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Heptachlor	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	Heptachlor epoxide	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	Hexachlorobenzene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Hexachlorobutadiene	3.4	ug/L	U	3.4	14
4/10/2006	BLANK	BNA-Water	Hexachlorocyclopentadiene	3.4	ug/L	U	3.4	14
4/10/2006	BLANK	BNA-Water	Hexachloroethane	3.4	ug/L	U	3.4	14
4/10/2006	BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Isophorone	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	N-Nitrosodi-n-propylamine	2.3	ug/L	U	2.3	9.1
4/10/2006	BLANK	BNA-Water	N-Nitrosodimethylamine	2.3	ug/L	U	2.3	9.1
4/10/2006	BLANK	BNA-Water	N-Nitrosodiphenylamine	3.4	ug/L	UJ	3.4	14
4/10/2006	BLANK	BNA-Water	Naphthalene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Nitrobenzene	2.3	ug/L	U	2.3	9.1
4/10/2006	BLANK	BNA-Water	Pentachlorophenol	3.4	ug/L	U	3.4	14
4/10/2006	BLANK	BNA-Water	Phenanthrene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Phenol	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	Pyrene	1.1	ug/L	U	1.1	4.5
4/10/2006	BLANK	BNA-Water	alpha-BHC	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	beta-BHC	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	delta-BHC	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	BNA-Water	gamma-BHC	1.7	ug/L	U	1.7	6.8
4/10/2006	BLANK	GC-Water	Alachlor	0.59	ug/L	U	0.59	2.4
4/10/2006	BLANK	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	GC-Water	Atrazine	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	GC-Water	Azinphos Methyl	0.2	ug/L	U	0.2	0.8
4/10/2006	BLANK	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
4/10/2006	BLANK	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
4/10/2006	BLANK	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	GC-Water	Chlorpyrifos Methyl	0.099	ug/L	UJ	0.099	0.4
4/10/2006	BLANK	GC-Water	Diazinon	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	BLANK	GC-Water	Ethoprop	0.099	ug/L	U	0.099	0.4
4/10/2006	BLANK	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
4/10/2006	BLANK	GC-Water	Fonofos	0.099	ug/L	U	0.099	0.4
4/10/2006	BLANK	GC-Water	Hexazinone	0.099	ug/L	U	0.099	0.4
4/10/2006	BLANK	GC-Water	Malathion	0.15	ug/L	UJ	0.15	0.6
4/10/2006	BLANK	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
4/10/2006	BLANK	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
4/10/2006	BLANK	GC-Water	Metribuzin	0.099	ug/L	U	0.099	0.4
4/10/2006	BLANK	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
4/10/2006	BLANK	GC-Water	Naled	0.79	ug/L	U	0.79	3.2
4/10/2006	BLANK	GC-Water	Norflurazon	0.15	ug/L	U	0.15	0.6
4/10/2006	BLANK	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
4/10/2006	BLANK	GC-Water	Parathion Methyl	0.099	ug/L	U	0.099	0.4
4/10/2006	BLANK	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	GC-Water	Prometryn	0.15	ug/L	UJ	0.15	0.6
4/10/2006	BLANK	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	Metals-Water	Aluminum	556	ug/L		5	20
4/10/2006	BLANK	Metals-Water	Arsenic	0.53	ug/L	I	0.5	2
4/10/2006	BLANK	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
4/10/2006	BLANK	Metals-Water	Calcium	48.2	mg/L		0.05	0.2
4/10/2006	BLANK	Metals-Water	Chromium	2	ug/L	U	2	8
4/10/2006	BLANK	Metals-Water	Copper	1.4	ug/L	I	0.75	3
4/10/2006	BLANK	Metals-Water	Iron	143	ug/L		10	40
4/10/2006	BLANK	Metals-Water	Lead	0.37	ug/L		0.075	0.3
4/10/2006	BLANK	Metals-Water	Magnesium	20	mg/L		0.01	0.04
4/10/2006	BLANK	Metals-Water	Nickel	1.1	ug/L	I	1	4
4/10/2006	BLANK	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
4/10/2006	BLANK	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
4/10/2006	BLANK	Metals-Water	Zinc	5.3	ug/L	I	3	12
4/10/2006	BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	UY	0.01	0.02
4/10/2006	BLANK	Nutrients-Liquid	Kjeldahl Nitrogen	0.08	mg N/L	U	0.08	0.2
4/10/2006	BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	UY	0.004	0.01
4/10/2006	BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
4/10/2006	BLANK	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
4/10/2006	BLANK	Overflow	Oil and Grease	8.1	mg/L			
4/10/2006	CONTROL	Bio-AGP/LimNut	Algal Growth Potential	27.5	mg DryWt/L		0.3	0.9
4/10/2006	CONTROL	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
4/10/2006	CONTROL	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	1.5	ug/L	U	1.5	4.5
4/10/2006	CONTROL	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	36	# Taxa			
4/10/2006	CONTROL	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	44	# Taxa			
4/10/2006	CONTROL	Bio-Peri/Phyto	Periphyton-Qualitative-# Diatom Taxa	45	# Taxa			
4/10/2006	CONTROL	Bio-Peri/Phyto	Periphyton-Qualitative-# Wet Taxa	11	#Taxa			
4/10/2006	CONTROL	Metals-Water	Aluminum	167	ug/L		5	20

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	CONTROL	Metals-Water	Arsenic	0.72	ug/L	I	0.5	2
4/10/2006	CONTROL	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
4/10/2006	CONTROL	Metals-Water	Calcium	26.4	mg/L		0.05	0.2
4/10/2006	CONTROL	Metals-Water	Chromium	2	ug/L	U	2	8
4/10/2006	CONTROL	Metals-Water	Copper	0.54	ug/L	I	0.25	1
4/10/2006	CONTROL	Metals-Water	Iron	727	ug/L		10	40
4/10/2006	CONTROL	Metals-Water	Lead	0.35	ug/L		0.075	0.3
4/10/2006	CONTROL	Metals-Water	Magnesium	4	mg/L		0.01	0.04
4/10/2006	CONTROL	Metals-Water	Nickel	1.2	ug/L	I	1	4
4/10/2006	CONTROL	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
4/10/2006	CONTROL	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
4/10/2006	CONTROL	Metals-Water	Zinc	3	ug/L	U	3	12
4/10/2006	CONTROL	Nutrients-Liquid	Ammonia-N	0.02	mg N/L	AY	0.01	0.02
4/10/2006	CONTROL	Nutrients-Liquid	Kjeldahl Nitrogen	0.37	mg N/L	Y	0.08	0.2
4/10/2006	CONTROL	Nutrients-Liquid	NO2NO3-N	0.58	mg N/L	Y	0.004	0.01
4/10/2006	CONTROL	Nutrients-Liquid	O-Phosphate-P	0.098	mg P/L		0.004	0.01
4/10/2006	CONTROL	Nutrients-Liquid	Total-P	0.13	mg P/L	Y	0.02	0.06
4/10/2006	PCA, EFFLUENT	Bio-AGP/LimNut	Algal Growth Potential	6.29	mg DryWt/L		0.3	0.9
4/10/2006	PCA, EFFLUENT	Bio-BOD	Biochemical Oxygen Demand-5 Day	4.8	mg/L	A		
4/10/2006	PCA, EFFLUENT	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	24	ug/L	A	1.2	3.7
4/10/2006	PCA, EFFLUENT	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	2.1	ug/L	U	2.1	6.4
4/10/2006	PCA, EFFLUENT	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	15	LC50	L		
4/10/2006	PCA, EFFLUENT	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	15	LC50	L		
4/10/2006	PCA, EFFLUENT	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
4/10/2006	PCA, EFFLUENT	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
4/10/2006	PCA, EFFLUENT	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
4/10/2006	PCA, EFFLUENT	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	4,4'-DDT	1.4	ug/L	UJ	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	PCA, EFFLUENT	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
4/10/2006	PCA, EFFLUENT	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
4/10/2006	PCA, EFFLUENT	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Benzidine	95	ug/L	U	95	380
4/10/2006	PCA, EFFLUENT	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
4/10/2006	PCA, EFFLUENT	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
4/10/2006	PCA, EFFLUENT	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
4/10/2006	PCA, EFFLUENT	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
4/10/2006	PCA, EFFLUENT	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
4/10/2006	PCA, EFFLUENT	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
4/10/2006	PCA, EFFLUENT	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
4/10/2006	PCA, EFFLUENT	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
4/10/2006	PCA, EFFLUENT	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
4/10/2006	PCA, EFFLUENT	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	PCA, EFFLUENT	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
4/10/2006	PCA, EFFLUENT	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
4/10/2006	PCA, EFFLUENT	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
4/10/2006	PCA, EFFLUENT	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
4/10/2006	PCA, EFFLUENT	GC-Water	Alachlor	0.6	ug/L	U	0.6	2.4
4/10/2006	PCA, EFFLUENT	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	GC-Water	Atrazine	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	GC-Water	Azinphos Methyl	0.2	ug/L	U	0.2	0.8
4/10/2006	PCA, EFFLUENT	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
4/10/2006	PCA, EFFLUENT	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
4/10/2006	PCA, EFFLUENT	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	UJ	0.1	0.4
4/10/2006	PCA, EFFLUENT	GC-Water	Diazinon	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
4/10/2006	PCA, EFFLUENT	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
4/10/2006	PCA, EFFLUENT	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
4/10/2006	PCA, EFFLUENT	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
4/10/2006	PCA, EFFLUENT	GC-Water	Malathion	0.15	ug/L	UJ	0.15	0.6
4/10/2006	PCA, EFFLUENT	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
4/10/2006	PCA, EFFLUENT	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
4/10/2006	PCA, EFFLUENT	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
4/10/2006	PCA, EFFLUENT	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
4/10/2006	PCA, EFFLUENT	GC-Water	Naled	0.8	ug/L	U	0.8	3.2
4/10/2006	PCA, EFFLUENT	GC-Water	Norflurazon	0.15	ug/L	U	0.15	0.6
4/10/2006	PCA, EFFLUENT	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
4/10/2006	PCA, EFFLUENT	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
4/10/2006	PCA, EFFLUENT	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	GC-Water	Prometryn	0.15	ug/L	UJ	0.15	0.6
4/10/2006	PCA, EFFLUENT	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	Metals-Water	Aluminum	538	ug/L		5	20
4/10/2006	PCA, EFFLUENT	Metals-Water	Arsenic	0.54	ug/L	I	0.5	2
4/10/2006	PCA, EFFLUENT	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
4/10/2006	PCA, EFFLUENT	Metals-Water	Calcium	48.2	mg/L		0.05	0.2
4/10/2006	PCA, EFFLUENT	Metals-Water	Chromium	2	ug/L	U	2	8
4/10/2006	PCA, EFFLUENT	Metals-Water	Copper	1.2	ug/L	I	0.75	3
4/10/2006	PCA, EFFLUENT	Metals-Water	Iron	136	ug/L		10	40
4/10/2006	PCA, EFFLUENT	Metals-Water	Lead	0.35	ug/L		0.075	0.3

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	PCA, EFFLUENT	Metals-Water	Magnesium	20.1	mg/L		0.01	0.04
4/10/2006	PCA, EFFLUENT	Metals-Water	Nickel	1.7	ug/L	I	1	4
4/10/2006	PCA, EFFLUENT	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
4/10/2006	PCA, EFFLUENT	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
4/10/2006	PCA, EFFLUENT	Metals-Water	Zinc	5.2	ug/L	I	3	12
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	Alkalinity	479	mg CaCO3/L		0.65	2.5
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	Ammonia-N	0.046	mg N/L	Y	0.01	0.02
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	Color	200	PCU	A	25	25
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	Kjeldahl Nitrogen	1.2	mg N/L		0.08	0.2
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	NO2NO3-N	0.51	mg N/L		0.004	0.01
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	O-Phosphate-P	0.51	mg P/L		0.024	0.06
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	TSS	4	mg/L	U	4	16
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	Total-P	0.63	mg P/L		0.02	0.06
4/10/2006	PCA, EFFLUENT	Nutrients-Liquid	Turbidity	9.6	NTU	A	0.05	0.05
4/10/2006	PCA, EFFLUENT	Overflow	Oil and Grease	8.6	mg/L	J		
4/10/2006	Control REP#1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	28	# Taxa			
4/10/2006	Test REP#1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	28	# Taxa			
4/10/2006	Control REP#2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	28	# Taxa			
4/10/2006	Test REP#2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	26	# Taxa			
4/10/2006	Control REP#3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	22	# Taxa			
4/10/2006	Test REP#3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	28	# Taxa			
4/10/2006	Control REP#4	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	22	# Taxa			
4/10/2006	Test REP#4	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	22	# Taxa			
4/10/2006	TEST	Bio-AGP/LimNut	Algal Growth Potential	27.9	mg DryWt/L		0.3	0.9
4/10/2006	TEST	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
4/10/2006	TEST	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	1.5	ug/L	U	1.5	4.5
4/10/2006	TEST	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	45	# Taxa			
4/10/2006	TEST	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	46	# Taxa			
4/10/2006	TEST	Bio-Peri/Phyto	Periphyton-Qualitative-# Diatom Taxa	43	# Taxa			
4/10/2006	TEST	Bio-Peri/Phyto	Periphyton-Qualitative-# Wet Taxa	9	#Taxa			
4/10/2006	TEST	Metals-Water	Aluminum	164	ug/L		5	20
4/10/2006	TEST	Metals-Water	Arsenic	0.57	ug/L	I	0.5	2
4/10/2006	TEST	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
4/10/2006	TEST	Metals-Water	Calcium	27.1	mg/L		0.05	0.2
4/10/2006	TEST	Metals-Water	Chromium	2	ug/L	U	2	8
4/10/2006	TEST	Metals-Water	Copper	0.57	ug/L	I	0.25	1
4/10/2006	TEST	Metals-Water	Iron	683	ug/L		10	40
4/10/2006	TEST	Metals-Water	Lead	0.32	ug/L		0.075	0.3
4/10/2006	TEST	Metals-Water	Magnesium	4.4	mg/L		0.01	0.04
4/10/2006	TEST	Metals-Water	Nickel	1.2	ug/L	I	1	4
4/10/2006	TEST	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
4/10/2006	TEST	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
4/10/2006	TEST	Metals-Water	Zinc	3	ug/L	U	3	12

DATE	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
4/10/2006	TEST	Nutrients-Liquid	Ammonia-N	0.023	mg N/L	Y	0.01	0.02
4/10/2006	TEST	Nutrients-Liquid	Kjeldahl Nitrogen	0.47	mg N/L		0.16	0.4
4/10/2006	TEST	Nutrients-Liquid	NO2NO3-N	0.69	mg N/L	Y	0.004	0.01
4/10/2006	TEST	Nutrients-Liquid	O-Phosphate-P	0.11	mg P/L		0.004	0.01
4/10/2006	TEST	Nutrients-Liquid	Total-P	0.13	mg P/L		0.02	0.06

FDEP Biology Section - Acute Screen Bioassay Bench Sheets

Facility: Packaging Corporation of America (formerly Teneco Packaging)
Address: 5495 Lake Park/Clyattville Rd.
City: Clyattville, GA County: Hamilton
Contact/District: Tom Kallemeyn /Northeast District
NPDES Permit #: FL 0000281
LIMS Job #: TAH-2006-04-11-06-01 LIMS Sample #: 914367
Lims Data Entry: 4-13-06 SP Data Entry Verification: 4-14-06 MF

Sample Collection: Date: 4-10-06 Time: 1446
Hold Time Start: Date: 4-10-06 Time: 1446

Comments:
Sample was filtered through a 60µm screen to remove debris. Sample was also diluted to 15% concentration using 30% DMW for Test 1 and Well Water for Test 2 per permit requirements.

15% Sample Test 2:
lab total Cl_2: <0.05 mg/L, alkalinity: 207 mg/L, hardness: 144 mg/L, total ammonia: <0.017 mg/L, salinity <1 ppth

Instructions (for below): Circle appropriate wording. If yes is circled, complete blanks.

Test Type: Screen
(Static) / Static Renewal / Flow-through
Test Duration: (48) 96 Hours.
Light Intensity : 50 - 100 ft. candles.
Photoperiod : 16 hours light 8 hours dark.

Test 1 validation: Test 1: SOP TA 07_01
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Test 2 validation: Test 2: SOP TA 07_02
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Initial sample handling:
PH adjustment : yes (no) Initial pH: ____ NaOH N HCl N ____ Drops mL Final pH: ____
Aeration : yes (no) Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~ ____bubbles/min
Salinity adjusted (Test 1): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Salinity adjusted (Test 2): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Dechlorination: yes (no) ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Temperature Range °C
Incubator # 2 Range 24.3 – 27.1
Room B246 23.6 – 26.8
Waterbath: n/A

Sample Validation:
Temperature: Shipped ≤6°C (Yes) No Hand Delivered: Cooling (received °C < collected °C) Yes No
Holding Time: ≤36 Hours (Yes) No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures
Sarah Pritchard
Bill McAlexander
Jason Davis
Marshall Faircloth
Ryan Carnes
Mark Wellendorf
REVIEWER

Water Quality Parameters	20% DMW	Moderately Hard Water/ (Well Water)	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other: 15% Sample Test 1	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	N/A	N/A	N/A	N/A	—	NOT MEASURED	—	—	SP
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03			<0.03	<0.03	HACH	SP/BA	MF
Alkalinity (mg/L as $CaCO_3$):	88	141			145	531	HACH	SP/SA	SP
Hardness (mg/L as $CaCO_3$):	91	140			112	186	HACH	SP/SA	SP
Total Ammonia (mg/L as N):	<0.017	<0.017			<0.017	<0.017	DENVER	BA	SP
Salinity (ppth):	<1	<1			<1	0.97	YSI / Mettler	SP	BA

V 1.4 9/12/05

FDEP Biology Section - Bioassay Survival Sheet

LIMS Sample #: 914367 | Test #: 1 | Test Started: Date 4-11-06 Time: 1130

Organism: C. dubia | SOP #: TA 07_ 01 | Test Ended: Date 4-13-06 Time: 1220

Organism Batch: 17-06 | Diluent/ Batch: DMW / 10-06

Organism Age: <24 hours | Food: YCT, *P. subcapitata*, *Artemia*

Chamber Size: 1000 mL | Batch: 505, 1-06, –

Test Volume: 500 mL | Feeding: (Prior to test) - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour: 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
15%	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
Organisms loaded by: SP		Checked by:	[redacted]	BA	BA			

Loading Verified by: BA

m = missing d = dead BR = before renewal AR = after renewal

Comments:

Test Results:

% mortality in 100% sample: Ø

LC_{50}: ~~>100~~ >15 (SP) If Calculated: 95% CI ________ Method: ________

Screening Tests:

Report LC50 as >100%, =100%, or <100%.

Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

V 2.1 11/01/2005

Page 000012

FDEP Biology Section - Bioassay Survival Sheet

LIMS Sample #: 914367 **Test #:** 2 **Test Started:** Date 4-11-06 Time: 1115
Organism: C. leedsi **SOP #:** TA 07_02 **Test Ended:** Date 4-13-06 Time: 12:25
Organism Batch: 7-06 **Diluent/ Batch:** Well H₂O / 4-10-06
Organism Age: 13 days **Food:** YCT P. subcapitata Artemia
Chamber Size: 1000 mL **Batch:** – – GSL-536-90
Test Volume: 500 mL **Feeding:** (Prior to test) - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	C1	5	5	5			
	B	C2	5	5	5			
	C	C3	5	5	5			
	D	C4	5	5	5			
15%	A	C5	5	5	5			
	B	C6	5	5	5			
	C	C7	5	5	4 1D			
	D	C8	5	5	5			
Organisms loaded by: JG		Checked by:	[redacted]	BA	BA			

Loading Verified by: BA

Comments:

m = missing d = dead BR = before renewal AR = after renewal

Test Results:
% mortality in 100% sample: ~~0~~ 5 (JP)
LC_{50}: >15 If Calculated: 95% CI__________ Method:__________
Screening Tests:
Report LC50 as >100%, =100%, or <100%.
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

V 2.1 11/01/2005

Page 000013

FDEP Biology Section - Bioassay Parameter Sheet

LIMS Sample # : 9143607 **Test #:** 1 of 2

TEST SOP #: TA07_01 **Test Species:** (*Ceriodaphnia dubia*) *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	/	B			
pH (S.U.)	8.2	/	8.2			
Temperature °C	24.7	/	24.0			
Dissolved Oxygen mg/L	7.8	/	6.7			
Conductivity (µmhos) mmhos	183	/	236			
(initials) Measured by:	JD	—	BA			
(initials) Recorded by:	JD	—	BA			

Comments:

Concentration 15%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	/	B			
pH (S.U.)	8.3	/	8.1			
Temperature °C	24.9	/	24.1			
Dissolved Oxygen mg/L	7.9	/	6.8			
Conductivity (µmhos) mmhos	456	/	542			
(initials) Measured by:	JD	—	BA			
(initials) Recorded by:	JD	—	BA			

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

V 2.0 2/24/04

FDEP Biology Section - Bioassay Parameter Sheet

LIMS Sample # : 914367 **Test #:** 2 of 2

TEST SOP #: TA07_02 **Test Species:** *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	7.8	8.1	8.4			
Temperature °C	24.8	25.3	24.3			
Dissolved Oxygen mg/L	7.9	6.7	6.7			
Conductivity (µmhos) mmhos	255	274	274			
(initials) Measured by:	JD	BA	BA			
(initials) Recorded by:	JD	BA	BA			

Comments:

Concentration 15%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.1	8.3	8.5			
Temperature °C	24.9	24.9	24.7			
Dissolved Oxygen mg/L	7.7	6.6	6.5			
Conductivity (µmhos) mmhos	513	525	532			
(initials) Measured by:	JD	BA	BA			
(initials) Recorded by:	JD	BA	BA			

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

V 2.0 2/24/04

MBL Aquaculture
4569 Samuel Street
Sarasota, Florida 34233
TEL: (800) 889-0384
FAX: (941) 922-3874
EMAIL: sales@mblaquaculture.com
WEB: www.MBLAquaculture.com

NELAC Accredited

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 4/10/06

Shipped to: FDEP- Marshall Faircloth

P.O. No: _____

Species	Quantity	Age	Brood Number	Temperature	Salinity
Mysidopsis bahia					
Menidia beryllina					
Cyprinella leedsi	100+	12 Days	040324	20°C	
Pimephales promelas					

Packed by: Frank Gonzi

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

Frank Gonzi

Appendix G

Standard Reference Toxicant data

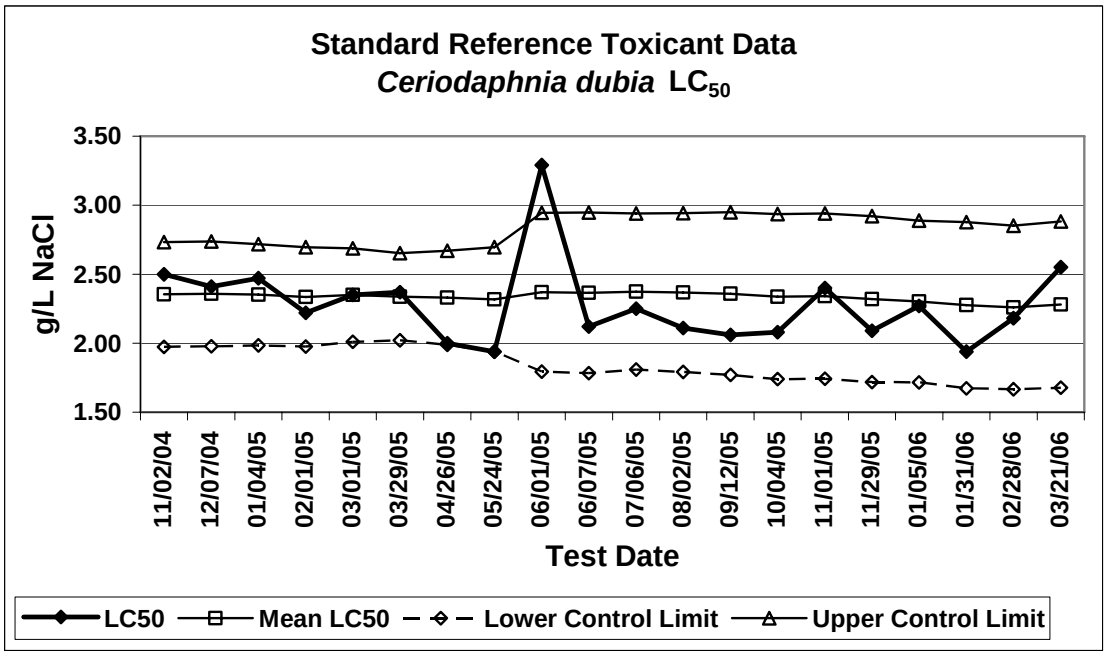
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
11/02/04	2.50	2.35	0.19	1.97	2.73
12/07/04	2.41	2.36	0.19	1.98	2.74
01/04/05	2.47	2.35	0.18	1.98	2.72
02/01/05	2.22	2.34	0.18	1.98	2.70
03/01/05	2.35	2.35	0.17	2.01	2.69
03/29/05	2.37	2.34	0.16	2.02	2.65
04/26/05	2.00	2.33	0.17	1.99	2.67
05/24/05	1.94	2.32	0.19	1.94	2.70
06/01/05	3.29	2.37	0.29	1.79	2.94
06/07/05	2.12	2.36	0.29	1.78	2.95
07/06/05	2.25	2.37	0.28	1.81	2.94
08/02/05	2.11	2.37	0.29	1.79	2.94
09/12/05	2.06	2.36	0.29	1.77	2.95
10/04/05	2.08	2.34	0.30	1.74	2.94
11/01/05	2.40	2.34	0.30	1.74	2.94
11/29/05	2.09	2.32	0.30	1.72	2.92
01/05/06	2.27	2.30	0.29	1.72	2.89
01/31/06	1.94	2.28	0.30	1.67	2.88
02/28/06	2.18	2.26	0.30	1.67	2.85
03/21/06	2.55	2.28	0.30	1.68	2.88

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 13.22
EPA reference 75th quartile CV = 29%



FDEP Biology Section - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* (Method 2007.0) | *Menidia beryllina* (Method 2006.0) | *Hyalella azteca* (Method 100.1 EPA-600-R-99-064) | **Ceriodaphnia dubia** (Method 2002.0) | *Cyprinella leedsi* (Method 2000.0) | *Pimephales promelas* (Method 2000.0) | Other:

Method from EPA-821-R-02-012
Test Type: Definitive
Static / Static Renewal
Test Page 1 of 2

Diluent/ Batch#: DMW / 8-06
Toxicant/ Batch# NaCl / 4-06

Test Beginning: Date: 3-21-06 Time: 1230
Test Ending: Date: 3-25-06 Time: 1300 (1320) mf

Water Quality Parameters:	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	mf
Alkalinity (mg/L as $CaCO_3$):	84	Hach	mf
Hardness (mg/L as CaCO3):	85	Hach	mf
Total Ammonia (mg/L as N):	<0.017	Denver	mf
Salinity (ppth):	<1	Mettler	mf

Organism Batch #/ Age: 13-06 / <24 hrs
Feeding: (Prior to test) (Prior to renewal) / Daily
Food: YCT P.*subcapitata* Artemia
Food Batch: 5-05 1-06 —
Chamber size: 30 mL
Test volume: 20 mL per replicate

0-48 hours

Conc. µg/L (ai)	Rep.	Chamber#	Number Live 0 hr (48 hr)	Number Live 24 hr (72 hr)	Number Live 48 hr (96 hr)	pH (SU) 0 hr (48 hr)	pH (SU) 24 hr (72 hr)	pH (SU) 48 hr (96 hr)	Temperature (°C) 0 hr (48 hr)	Temperature (°C) 24 hr (72 hr)	Temperature (°C) 48 hr (96 hr)	D.O. (mg/l) 0 hr (48 hr)	D.O. (mg/l) 24 hr (72 hr)	D.O. (mg/l) 48 hr (96 hr)	UNCORRECTED Cond. (mmhos/cm) 0 hr (48 hr)	UNCORRECTED Cond. (mmhos/cm) 24 hr (72 hr)	UNCORRECTED Cond. (mmhos/cm) 48 hr (96 hr)
Control	A	A	5	5	5	8.1		8.2	24.0		24.8	7.3		7.8	0.174		0.193
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
1.5	A	A	5	5	5	8.0		8.1	24.0		24.6	7.4		7.6	2.92		3.38
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
2.0	A	A	5	5	5	8.2		8.1	24.0		24.5	7.0		7.6	3.81		5.34 → 4.35 (SP, skipper)
	B	B	5	5	4 1D												
	C	C	5	5	5												
	D	D	5	5	5												
2.5	A	A	5	4 1D	4 1D	8.2		8.1	24.1		24.6	7.1		7.4	4.71		6.45 → 5.34 (SP)
	B	B	5	5	4 1D												
	C	C	5	4 1D	3 1D												
	D	D	5	5	2 3D												
3.0	A	A	5	4 1D	0 4D	8.2		8.1	24.1		24.6	7.1		7.3	5.63		6.45
	B	B	5	3 2D	0 3D												
	C	C	5	2 3D	0 2D												
	D	D	5	3 2D	1 2D												
4.0	A	A	5	0 5D	—	8.1	7.8	—	24.4	24.6	—	7.2	6.5	—	7.29	7.65	—
	B	B	5	0 5D	—												
	C	C	5	0 5D	—												
	D	D	5	0 5D	—												
	A																
	B																
	C																
	D																
Loaded / measured by:			BA	BA	BA	BA	BA	SP	BA	BA	SP	BA	BA	SP	BA	BA	SP
Recorded by:			BA	BA	BA	BA	BA	MF	BA	BA	SP	BA	BA	SP	BA	BA	SP

Investigators' Signatures

Brian Alexander
Sarah Pickard
Marshall Faircloth
Jodie Dardis
Nicole Wellendorf
REVIEWER

Concentrations prepared by: BA
Loading verified by: MF
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min. 23.4 max. 26.1 mean 25.1
Incubator # ____ min. ____ max. ____ mean ____
Room B246 min. 24.2 max. 25.1 mean 25.1

Remarks:

Statistical Results: Method: Spearman-Karber
48 / 96 hour LC50: 2.55
95% Confidence Interval: lower 2.41 upper 2.69

Revised 03/21/06

FDEP Biology Section - Acute SRT Bench Sheet

[redacted]

Test Organism: *Americamysis bahia* (Method 2007.0) *Menidia beryllina* (Method 2006.0) *Hyalella azteca* (Method 100.1 EPA-600-R-99-064)
Ceriodaphnia dubia (Method 2002.0) *Cyprinella leedsi* (Method 2000.0) *Pimephales promelas* (Method 2000.0) Other:_____

Method from EPA-821-R-02-012
Test Type: Definitive / Static / Static Renewal
Test Page 2 of 2

Diluent/ Batch#: DMW / B-06
Toxicant/ Batch# NaCl / 4-06

Test Beginning: Date: 3-21-06 Time: 1230
Test Ending: Date: 3.25.06 Time: 1330 48-96hour

Water Quality Parameters:	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	MF
Alkalinity (mg/L as $CaCO_3$):	84	Hach	Std by MF
Hardness (mg/L as CaCO3):	85	Hach	Std by MF
Total Ammonia (mg/L as N):	<0.07	Denver	MF
Salinity (ppth):	< 1	Mettler	MF

Organism Batch #/ Age: 13-06 / 13-06
Feeding: Prior to test / Prior to renewal / Daily
Food: YCT P.subcapitata Artemia
Food Batch: 505 1-06 —
Chamber size: 30 mL
Test volume: 20 mL per replicate

Conc. µg/L (g/L)	Rep.	Chamber#	Number Live — 0 hr / 24 hr / 48 hr / 48 hr / 72 hr / 96 hr	pH (SU) — 0 hr / 24 hr / 48 hr / 48 hr / 72 hr / 96 hr	Temperature (° C) — 0 hr / 24 hr / 48 hr / 48 hr / 72 hr / 96 hr	D.O. (mg/l) — 0 hr / 24 hr / 48 hr / 48 hr / 72 hr / 96 hr	UNCORRECTED Cond (mmhos/cm) Cond. (µmhom/cm) — 0 hr / 24 hr / 48 hr / 48 hr / 72 hr / 96 hr
Control	A	A	5 5 5	8.3	24.0 24.3	7.9	0.172 0.248
	B	B	5 5 5	8.2	24.0 24.0 BA 24.0	7.7	
	C	C	5 5 5				
	D	D	5 5 5				
1.5	A	A	5 5 5	8.2	24.0	6.7	2.40 3.44
	B	B	5 5 4 D	8.2	MF 24.0 24.0	8.3	
	C	C	5 5 5				
	D	D	5 5 5				
2.0	A	A	5 5 5	8.2	24.0	7.0	3.82
	B	B	4 4 4	8.3	MF 24.0 24.0	8.5	4.54
	C	C	5 5 5				
	D	D	5 5 5				
2.5	A	A	4 2 D 2	8.2	24.3 MF	7.2	4.62
	B	B	4 2 D 1 D	8.3	24.0 24.0	8.2	5.75
	C	C	3 3 2 D				
	D	D	2 0 D —				
3.0	A	A	0 — —	8.2	24.3	7.0	6.56
	B	B	0 — —		— —	—	—
	C	C	0 — —				
	D	D	1 0 D —	8.0	24.9 MF 24.9	7.4	5.86 BA 5.86
AD	A	A	— — —	—	—	—	—
	B	B	— — —		— —	—	—
	C	C	— — —				
	D	D	— — —		24.4 BA		
	A						
	B						
	C						
	D						
Loaded / measured by:			BA BA JD	BA BA JD	BA BA JD	BA BA JD	BA BA JD
Recorded by:			BA BA JD	BA BA JD	BA BA JD	BA BA JD	BA BA JD

Investigators' Signatures
Bruce Arnold
Jared Pritchard
Marshall Faircloth
James Dodd
Nicole Wellendorf
REVIEWER

Concentrations prepared by: BA
Loading verified by: MF
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 23.4 max. 26.1 mean 25.1
Incubator # ___ min. ___ max. ___ mean ___
Room B246 min. 24.2 max. 25.9 mean 25.1

Remarks: 96 hour temperatures recorded in 72 hour spaces - moved to 96 hour spaces 4-12-06 MF

Statistical Results: Method: Spearman-Karber
48 / 96 hour LC50: 2.33
95% Confidence Interval: lower 2.23 upper 2.44 BA
Revised 02/21/06

Page 000042

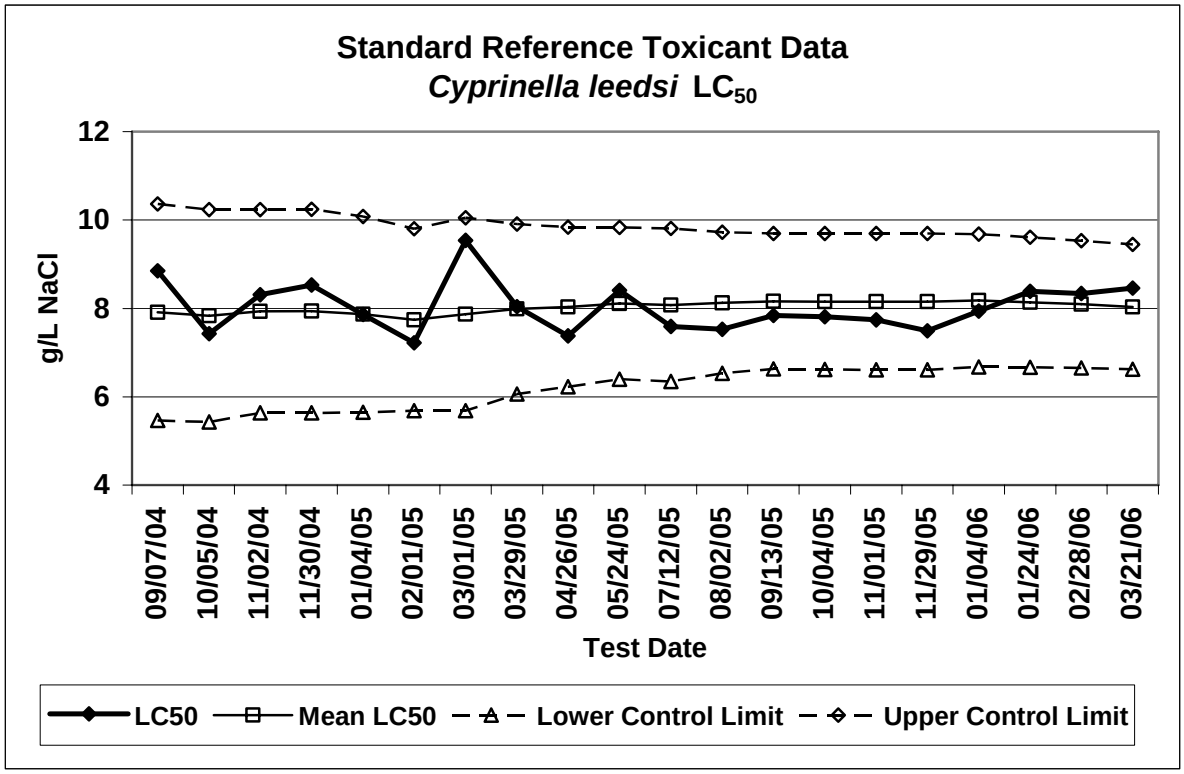
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
09/07/04	8.85	7.91	1.22	5.46	10.36
10/05/04	7.43	7.83	1.20	5.43	10.24
11/02/04	8.31	7.93	1.15	5.63	10.24
11/30/04	8.53	7.94	1.15	5.63	10.24
01/04/05	7.86	7.87	1.11	5.65	10.08
02/01/05	7.22	7.74	1.03	5.68	9.80
03/01/05	9.54	7.87	1.09	5.68	10.05
03/29/05	8.04	7.99	0.96	6.07	9.91
04/26/05	7.38	8.03	0.90	6.22	9.84
05/24/05	8.41	8.11	0.86	6.40	9.83
07/12/05	7.59	8.08	0.86	6.35	9.81
08/02/05	7.53	8.13	0.80	6.53	9.72
09/13/05	7.84	8.16	0.77	6.63	9.70
10/04/05	7.81	8.16	0.77	6.62	9.69
11/01/05	7.74	8.15	0.77	6.61	9.69
11/29/05	7.49	8.15	0.77	6.61	9.69
01/04/06	7.94	8.18	0.75	6.67	9.68
01/24/06	8.39	8.14	0.74	6.67	9.61
02/28/06	8.34	8.09	0.72	6.65	9.53
03/21/06	8.46	8.04	0.71	6.62	9.45

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 8.80
EPA reference 75th quartile CV = 19%



FDEP Biology Section - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064 | *Ceriodaphnia dubia* Method 2002.0 | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other:_____

Method from EPA-821-R-02-012
Test Type: Definitive
Static / Static Renewal
Test Page 1 of 2

Diluent/ Batch#: well H2O 3-21-06
Toxicant/ Batch# NaCl 1-4-06

Test Beginning: Date: 3-21-06 Time: 12:50
Test Ending: Date: 3-25-06 Time: 1300

Water Quality Parameters:	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	mf
Alkalinity (mg/L as $CaCO_3$):	145	Hach	mf
Hardness (mg/L as CaCO3):	136	Hach	mf
Total Ammonia (mg/L as N):	<0.017	Denver	mf
Salinity (ppth):	<1	Mettler	mf

Organism Batch #/ Age: 6-06 / 13 days
Feeding: Prior to test / Prior to renewal / Daily
Food: YCT *P.subcapitata* Artemia
Food Batch: — — GSL-536-90
Chamber size: 1000 mL
Test volume: 500 mL per replicate

0-48 hours

Conc. µg/L (%)	Rep.	Chamber#	Number Live 0 hr (48 hr)	Number Live 24 hr (72 hr)	Number Live 48 hr (96 hr)	pH (SU) 0 hr (48 hr)	pH (SU) 24 hr (72 hr)	pH (SU) 48 hr (96 hr)	Temperature (° C) 0 hr (48 hr)	Temperature (° C) 24 hr (72 hr)	Temperature (° C) 48 hr (96 hr)	D.O. (mg/l) 0 hr (48 hr)	D.O. (mg/l) 24 hr (72 hr)	D.O. (mg/l) 48 hr (96 hr)	UNCORRECTED Cond (mmhos/cm) 0 hr (48 hr)	UNCORRECTED Cond (mmhos/cm) 24 hr (72 hr)	UNCORRECTED Cond (mmhos/cm) 48 hr (96 hr)
Control	A	A24	10	10	10	7.9		8.1	24.7		25.0	7.7		6.5	0.220		0.283
	B	A2	10	10	10		8.0			24.7			6.6			0.323	
	C																
	D																
6	A	A3	10	9 20	8	7.9		8.1	24.8		24.9	7.7		6.1	10.40		10.47
	B	A4	10	10	10		7.9			24.9			6.0			10.32	
	C																
	D																
7	A	A5	10	10	10	7.9		8.0	24.8		24.8	7.5		5.9	12.04		12.10
	B	A6	10	9 10	9		7.9			25.2			5.7			11.93	
	C																
	D																
8	A	A7	10	6 40	6	7.9		8.0	24.9		25.2	7.5		5.6	13.37		13.49
	B	A8	10	8 20	7 10		7.8			24.9			5.8			13.39	
	C																
	D																
9	A	A9	10	3 70	3	7.9		8.0	24.9		25.1	7.4		5.6	15.10		15.19
	B	A10	10	4 60	4		7.9			24.8			5.9			15.15	
	C																
	D																
10	A	A11	10	1 40	1	7.9		8.0	24.8		24.9	7.4		5.3	16.73		16.84
	B	A12	10	1 40	1		7.8			25.0			5.2			16.77	
	C																
	D																
	A																
	B																
	C																
	D																
Loaded / measured by:			JD	JD	JD	mf	BA	mf	mf	JD	mf	mf	BA	mf	mf	BA	mf
Recorded by:			BA	JD	JD	mf	BA	mf	mf	BA	SR	mf	BA	mf	mf	BA	mf

Investigators' Signatures
Bruce Neudorf
Jarad Pritchard
Marshall Faircloth
Jessie Davis
Kevin Leif
Nicole Nettenkoff
REVIEWER

Concentrations prepared by: mf
Loading verified by: BA
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min. 24.2 max. 25.9 mean 25.1
Incubator # ___ min. ___ max. ___ mean ___
Room B246 min. 24.2 max. 25.9 mean 25.1

Remarks:
48 hr 8.46
lower 8.08
upper 8.86

Statistical Results: Method: Spearman-Karber
48/96 hour LC50: 8.46
95% Confidence Interval: lower 8.08 upper 8.86

Revised 02/21/06

Page 000039

FDEP Biology Section - Acute SRT Bench Sheet

[redacted]

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2004.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | (*Cyprinella leedsi* Method 2000.0) | *Pimephales promelas* Method 2000.0 | Other:_____

Method from EPA-821-R-02-012
Test Type: (Definitive) Static / Static Renewal
Test Page 2 of 2

Diluent/ Batch#: well H_2O / 3-21-06
Toxicant/ Batch# NaCl / 4-06

Test Beginning: Date: 3-21-06 Time: 1250
Test Ending: Date: 3-25-06 Time: 1300

48-96 hours

Water Quality Parameters:	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	MF/BA
Alkalinity (mg/L as $CaCO_3$):	145	Hach	SA/MF
Hardness (mg/L as CaCO3):	130	Hach	SA/MF
Total Ammonia (mg/L as N):	<0.017	Denver	MF/SA
Salinity (ppth):	< 1	Mettler	MF

Organism Batch #/ Age: 6-06 / 13 days
Feeding: (Prior to test) Prior to renewal / Daily
Food: YCT P.*subcapitata* Artemia
Food Batch: — — GSL-536-90
Chamber size: 1000 mL
Test volume: 500 mL per replicate

Conc. µg/L	Rep.	Chamber#	Number Live 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	pH (SU) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	Temperature (°C) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	D.O. (mg/l) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	UNCORRECTED Cond. (mmhos/cm) / Cond. (µmhos/cm) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)
Control	A	A24	10 / 10 / 10	7.9 / — / 8.2	24.9 / — / 24.0	7.6 / — / 7.8	0.264 / — / 0.285
	B	A2	10 / 10 / 10	— / 7.9 / —	— / 24.4 / —	— / 5.6 / —	— / 0.296 / —
	C						
	D						
6	A	A3	8 / 8 / 8	7.9 / — / 8.1	24.8 / — / 24.0	7.4 / — / 6.4	10.45 / — / 11.37
	B	A4	10 / 10 / 10	— / 7.9 / —	— / 24.4 / —	— / 5.6 / —	— / 10.79 / —
	C						
	D						
7	A	A5	10 / 10 / 10	7.9 / — / 8.1	25.0 / — / 24.1	7.5 / — / 7.1	12.11 / — / 12.77
	B	A6	9 / 9 / 9	— / 8.0 / —	— / 24.4 / —	— / 6.0 / —	— / 12.63 / —
	C						
	D						
8	A	A7	6 / 6 / 6	7.9 / — / 8.1	24.9 / — / 24.0	7.4 / — / 7.3	13.52 / — / 14.1
	B	A8	7 / 7 / 7	— / 8.0 / —	— / 24.4 / —	— / 6.2 / —	— / 14.91 / —
	C						
	D						
9	A	A9	3 / 3 / 3	7.9 / — / 8.2	24.9 / — / 24.2	7.3 / — / 7.4	15.22 / — / 16.4
	B	A10	4 / 4 / 4	— / 8.0 / —	— / 24.7 / —	— / 6.1 / —	— / 15.85 / —
	C						
	D						
10	A	A11	1 / 0[1]0 / —	7.9 / — / —	24.8 / — / —	7.3 / — / —	16.83 / — / —
	B	A12	1 / 1 / 1	— / 8.0 / 8.2	— / 24.5 / 24.1	— / 6.0 / 7.3	— / 17.20 / 17.6
	C						
	D						
	A						
	B						
	C						
	D						
Loaded / measured by:			MF / JD / JD	MF / JD / JD	MF / JD / JD	MF / JD / JD	MF / JD / JD
Recorded by:			MF / JD / JD	MF / JD / JD	MF / JD / JD	MF / JD / JD	MF / JD / JD

Investigators' Signatures
Bruce Neville
Sarah Pinkard
Marshall Faircloth
Eric Muir
James Daniels
Randi Wallenstein
REVIEWER

Concentrations prepared by: MF/BA
Loading verified by: NA
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min. 23.4 max. 24.1 mean 23.1
Incubator # ___ min. ___ max. ___ mean ___
Room B246 min. 24.2 max. 25.9 mean 25.1

Remarks:

Statistical Results: Method: Spearman-Karber
48 (96) hour LC50: 8.43
95% Confidence Interval: lower 8.08 upper 8.81

Revised 02/21/06

Ceriodaphnia dubia Acute Standard Reference Toxicant Test

DATE: 3/21/06 DURATION: 48 h TOXICANT : NaCl
SPECIES: *C. dubia*

RAW DATA:	Concentration (g/L)	Number Exposed	Mortalities
	.00	20	0
	1.50	20	0
	2.00	20	1
	2.50	20	7
	3.00	20	19
	4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC_{50}: 2.55
95% LOWER CONFIDENCE: 2.41
95% UPPER CONFIDENCE: 2.69

Cyprinella leedsi Acute Standard Reference Toxicant Test

DATE: 3/21/06 DURATION: 48 H TOXICANT : NaCl
SPECIES: *C. leedsi*

RAW DATA:	Concentration (g/L)	Number Exposed	Mortalities
	.00	20	0
	6.00	20	2
	7.00	20	1
	8.00	20	7
	9.00	20	13
	10.00	20	18

SPEARMAN-KARBER TRIM: 10.00%

SPEARMAN-KARBER ESTIMATES: LC_{50}: 8.46
95% LOWER CONFIDENCE: 8.08
95% UPPER CONFIDENCE: 8.86

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING. ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

Appendix H

Typical Values for Selected Parameters in Florida Waters

Percentile Distribution (1617 stations)

CONTROL SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	**0.77**	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85	**0.85 U**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	**3.90**	**4.4**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	**32**	**44**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	**31**	37	53	**35**
Total Kjeldahl Nitrogen	**0.30**	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.37 Y**
Total Ammonia	0.02	**0.02**	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.020 AY**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	**0.32**	0.64	1.05	**0.58 Y**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	**0.13**	0.18	0.25	0.39	0.74	1.51	**0.13 Y**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	**0.08**	0.11	0.17	0.27	0.59	1.37	**0.098**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	**2.80**	3.60	4.50	6.65	10.45	16.30	**3.0**

TEST SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	**0.77**	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85	**0.85 U**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	**3.76**	3.90	**3.8**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	**32**	**46**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	**37**	53	**46**
Total Kjeldahl Nitrogen	0.30	**0.39**	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.47**
Total Ammonia	0.02	**0.02**	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.023 Y**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	**0.64**	1.05	**0.69 Y**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	**0.13**	0.18	0.25	0.39	0.74	1.51	**0.13**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	**0.11**	0.17	0.27	0.59	1.37	**0.11**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	**2.80**	3.60	4.50	6.65	10.45	16.30	**3.5**

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

Appendix I

Habitat Assessment Field Sheets

DEP-SOP-001/01: Form FD 9000-3 (December 11, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 21010029	DATE (M/D/Y): 4/6/10 12:15	TIME 12:55	RECEIVING BODY OF WATER: Suwannee
REMARKS: N 30 37 21.7 W 83 18 11.1	COUNTY:	LOCATION: with la coochi above PCM outfall		FIELD ID/NAME:

RIPARIAN ZONE/STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category):

FOREST/NATURAL	SILVICULTURE	FIELD/PASTURE	AGRICULTURAL	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER (SPECIFY)
35	60			4	1		

LOCAL WATERSHED EROSION (check box): None ☐ Slight ☒ Moderate ☐ Heavy ☐

LOCAL WATERSHED NPS POLLUTION (check box): No evidence ☐ Slight ☒ Moderate potential ☐ Obvious sources ☐

WIDTH OF RIPARIAN VEGETATION (m) On least buffered side: >18

LIST & MAP DOMINANT VEGETATION ON BACK

ARTIFICIALLY CHANNELIZED ☒ no ☐ recent, ☐ severe ☐ some recovery ☐ mostly recovered

ARTIFICIALLY IMPOUNDED ☐ yes ☐ more sinuous

HIGH WATER MARK: 4.0 (m above present water level) + 2.0 (present depth in m) = 6.0 (m above bed)

TYPICAL WIDTH (M) DEPTH (M)/VELOCITY (M/SEC) TRANSECT

m wide

m/s 0.1 m/s m/s

m deep 2 m deep m deep

CANOPY COVER %: OPEN: ☐ LIGHTLY SHADED (11-45%): ☒ MODERATELY SHADED (46-80%): ☐ HEAVILY SHADED: ☐

SEDIMENT/SUBSTRATE

SEDIMENT ODORS: NORMAL: ☒ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ ANAEROBIC: ☐ OTHER: ☐

SEDIMENT OILS: ABSENT: ☒ SLIGHT: ☐ MODERATE: ☐ PROFUSE: ☐

SEDIMENT DEPOSITION: SLUDGE: ☐ SAND SMOTHERING: NONE SLIGHT MODERATE SEVERE SILT SMOTHERING: NONE SLIGHT (MODERATE) SEVERE OTHER: ____

SUBSTRATE TYPE	% COVERAGE	# TIMES SAMPLED	METHOD	SUBSTRATE TYPES	% COVERAGE	# TIMES SAMPLED	METHOD
WOODY DEBRIS (SNAGS)	0.4	7		SAND	89.2	6	
LEAF PACKS OR MATS				MUD/MUCK/SILT	20		
AQUATIC VEGETATION				OTHER: Rock	10		
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS	0.3	7		DRAW AERIAL VIEW SKETCH OF HABITATS FOUND IN 100 M SECTION			

WATER QUALITY	DEPTH (M):	TEMP. (°C):	PH (SU):	D.O. (MG/L):	COND. (UMHO/CM) OR SALINITY (PPT):			SECCHI (M):
TOP								
MID-DEPTH	0.4	20.4	7.02	5.9	136	65%		1.2
BOTTOM								

SYSTEM TYPE: STREAM: 1ST-2ND ORDER ☐ 3RD-4TH ORDER ☐ 5TH – 6TH ORDER ☐ 7TH ORDER OR GREATER ☐ LAKE: ☐ WETLAND: ☐ ESTUARY: ☐ OTHER: ☐

WATER ODORS (CHECK BOX): NORMAL: ☒ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ OTHER: ☐

WATER SURFACE OILS (CHECK BOX): NONE: ☒ SHEEN: ☐ GLOBS: ☐ SLICK: ☐

CLARITY (CHECK BOX): CLEAR: ☒ SLIGHTLY TURBID: ☐ TURBID: ☐ OPAQUE: ☐

COLOR (CHECK BOX): TANNIC: ☒ GREEN (ALGAE): ☐ CLEAR: ☐ OTHER: ☐

WEATHER CONDITIONS/NOTES: Slightly Tannic

ABUNDANCE:	ABSENT	RARE	COMMON	ABUNDANT
PERIPHYTON	☐	☐	☒	☐
FISH	☐	☐	☒	☐
AQUATIC MACROPHYTES	☒	☐	☐	☐
IRON/SULFUR BACTERIA	☒	☐	☐	☐

SAMPLING TEAM: Percival Kullmeyer

SIGNATURE: G. K

DATE: 4/6/06

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 4/10/06	RECEIVING BODY OF WATER: Suwannee

REMARKS:	COUNTY:	LOCATION: Withlacoochi Above Pah	FIELD ID/NAME:

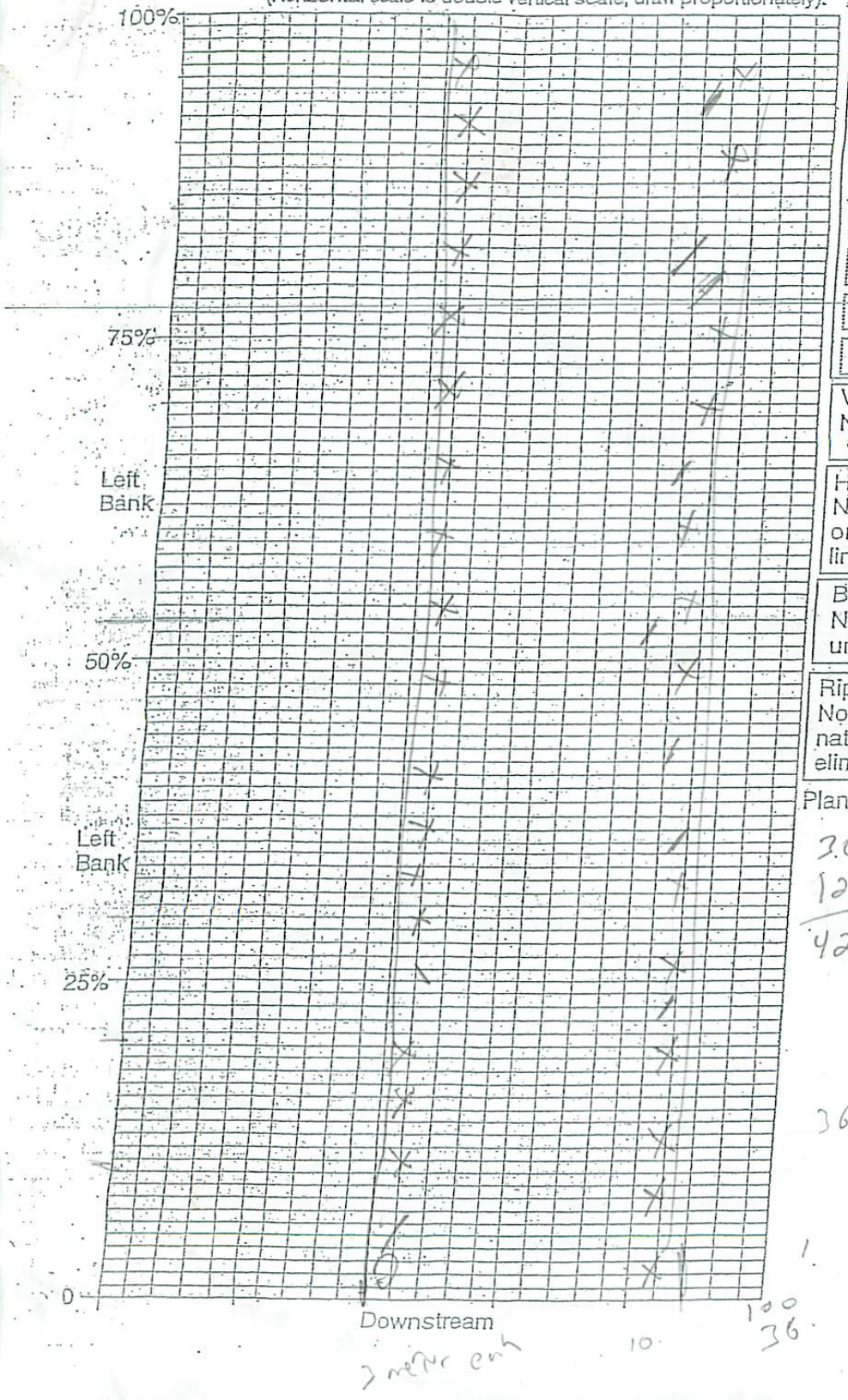
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 8	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 3	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 11	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 11 Primary Score 33	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 20	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 8 Left Bank 8	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 10 Secondary Score 76	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

109 **TOTAL SCORE**

ANALYSIS DATE: 4/10/06	ANALYST: Kellemey	SIGNATURE: Kellemey

Site Map / Habitat Sketch

Length of grid represents 100m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Field ID:

Substrates: Code key, draw proportionate habitat abunda

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

3.0 0.8 %
12 0.4 %
42 Total 1.2 %

velocity ~ .1
depth 2.0 m

3600

DEP-SOP-001/01: Form FD 9000-3 (December 11, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4/10/06	13:37	Suwannee

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
N30 37 11.0 W.83 16 5.6		Withlacoochee River Down Stream of PCA Effluent	

RIPARIAN ZONE/STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category):

FOREST/NATURAL	SILVICULTURE	FIELD/PASTURE	AGRICULTURAL	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER (SPECIFY)
35		60		4	9		

LOCAL WATERSHED EROSION (check box): None ☒ Slight ☐ Moderate ☐ Heavy ☐

LOCAL WATERSHED NPS POLLUTION (check box): No evidence ☒ Slight ☐ Moderate potential ☐ Obvious sources ☐

WIDTH OF RIPARIAN VEGETATION (m) On least buffered side: >18

LIST & MAP DOMINANT VEGETATION ON BACK

ARTIFICIALLY CHANNELIZED ☐ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

ARTIFICIALLY IMPOUNDED ☐ yes ☐ more sinuous

HIGH WATER MARK: 1.0 (m above present water level) + 2.0 (present depth in m) = 3.0 (m above bed)

TYPICAL WIDTH (M) DEPTH (M)/VELOCITY (M/SEC) TRANSECT

36 m wide

m/s	0.1 m/s	m/s
m deep	2.0 m deep	m deep

CANOPY COVER %: OPEN: ☐ LIGHTLY SHADED (11-45%): ☒ MODERATELY SHADED (46-80%): ☐ HEAVILY SHADED: ☐

SEDIMENT/SUBSTRATE

SEDIMENT ODORS: NORMAL: ☒ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ ANAEROBIC: ☐ OTHER: ☐

SEDIMENT OILS: ABSENT: ☒ SLIGHT: ☐ MODERATE: ☐ PROFUSE: ☐

SEDIMENT DEPOSITION: SLUDGE: ☐ SAND SMOTHERING: NONE SLIGHT MODERATE SEVERE SILT SMOTHERING: NONE SLIGHT MODERATE SEVERE OTHER:

SUBSTRATE TYPE	% COVERAGE	# TIMES SAMPLED	METHOD	SUBSTRATE TYPES	% COVERAGE	# TIMES SAMPLED	METHOD
WOODY DEBRIS (SNAGS)				SAND			
LEAF PACKS OF MATS				MUD/MUCK/SILT			
AQUATIC VEGETATION				OTHER:			
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS				DRAW AERIAL VIEW SKETCH OF HABITATS FOUND IN 100 M SECTION			

WATER QUALITY	DEPTH (M):	TEMP. (°C):	PH (SU):	D.O. (MG/L):	COND. (UMHO/CM) OR SALINITY (PPT):			SECCHI (M):
TOP								
MID-DEPTH	0.5	20.81	7.18	6.06	251	67.6%		1.2
BOTTOM								

SYSTEM TYPE: STREAM: 1ST-2ND ORDER ☐ 3RD-4TH ORDER ☐ 5TH – 6TH ORDER ☐ 7TH ORDER OR GREATER ☐ LAKE: ☐ WETLAND: ☐ ESTUARY: ☐ OTHER: ☐

WATER ODORS (CHECK BOX): NORMAL: ☒ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ OTHER: ☐

WATER SURFACE OILS (CHECK BOX): NONE: ☒ SHEEN: ☐ GLOBS: ☐ SLICK: ☐

CLARITY (CHECK BOX): CLEAR: ☐ SLIGHTLY TURBID: ☒ TURBID: ☐ OPAQUE: ☐

COLOR (CHECK BOX): TANNIC: ☒ GREEN (ALGAE): ☐ CLEAR: ☐ OTHER: ☐

WEATHER CONDITIONS/NOTES: whitish film/foam at surface - Hugging Banks

ABUNDANCE:	ABSENT	RARE	COMMON	ABUNDANT
PERIPHYTON	☐	☐	☒	☐
FISH	☐	☐	☒	☐
AQUATIC MACROPHYTES	☒	☐	☐	☐
IRON/SULFUR BACTERIA	☒	☐	☐	☐

SAMPLING TEAM: Tom Kallemeyn, Jeremy Parrish

SIGNATURE:

DATE: 4/10/06

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 4/10/06	RECEIVING BODY OF WATER: Suwannee

REMARKS:	COUNTY:	LOCATION: Withla Coochee R. Down Stream of PCA Effluent	FIELD ID/NAME:

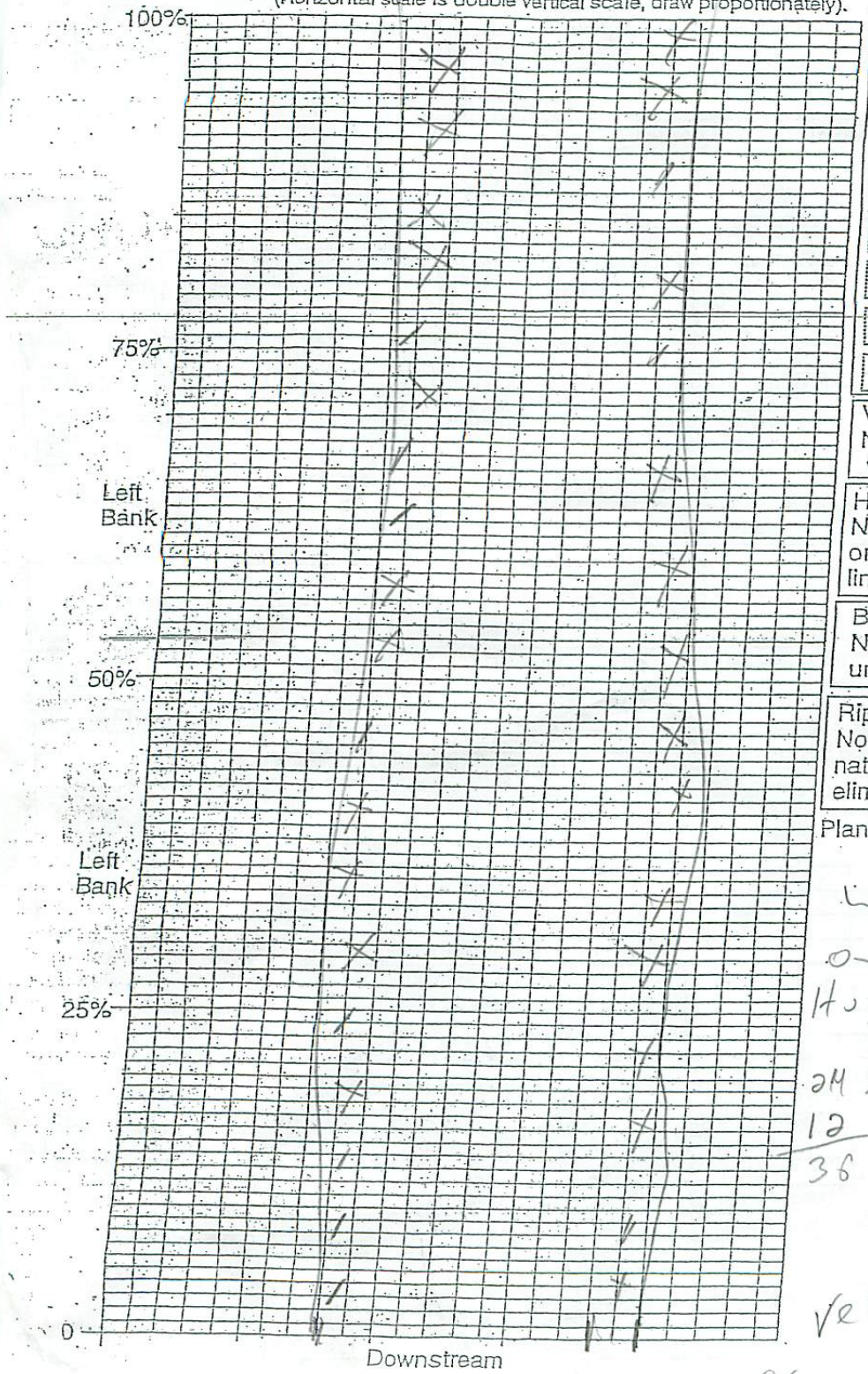
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 3	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 3	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 11	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 10 Primary Score 32	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
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Bank Stability Right Bank 3 Left Bank 7	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 10 Secondary Score 76	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

108 **TOTAL SCORE**

ANALYSIS DATE: 4/10/06	ANALYST: Dana Kellemeyer	SIGNATURE:

Site Map / Habitat Sketch

Length of grid represents 100m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Field ID:

Substrates: Code key, draw proportionate habitat abund

- 11 Snags
- X Roots/undercut banks
- D Leaf Packs (or mats)
- Macrophytes

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

White film on surface
Hugging Banks

2M SNAG 1.0 %
12
36 .6 ROOT
.4 SNAG

Vel 0.1

36m Limit

Appendix J

Taxa list and number of individuals counted for qualitative natural periphyton collections from Packaging Corporation of America facility discharge, April 10, 2006.

Phylum	Control (# counted)	Test (# counted)
Bacillariophyta		
Achnanthes sp.	1	-
Achnanthes clevei	1	1
Achnanthes exigua	4	8
Achnanthes lanceolata	11	39
Achnanthes lanceolata apiculata	5	6
Achnanthes lanceolata rostrata	18	23
Amphora sp.	1	2
Aulacoseira sp.	1	-
Bacillariophyceae	1	2
Capartogramma crucicula	1	3
Cocconeis fluviatilis	9	5
Cocconeis placentula	-	1
Cyclotella meneghiniana	1	1
Cymbella tumida	-	1
Cymbellaceae	-	2
Diadesmis confervacea	7	13
Encyonema neomesianum	-	1
Encyonema silesiacum	1	-
Eunotia sp.	34	4
Eunotia formica	-	1
Eunotia pectinalis undulata	-	1
Fragilaria capucina	2	-
Fragilariaceae	1	4
Frustulia sp.	10	1
Frustulia saxonica	-	1
Gomphonema sp.	6	14
Gomphonema grovei	1	-
Gomphonema parvulum	2	2
Gyrosigma sp.	5	1
Hippodonta capitata	3	1
Hippodonta hungarica	-	1
Hydrosera whampoensis	1	-
Melosira sp.	56	62
Navicula sp.	16	6
Navicula constans	-	1
Navicula cryptocephala	10	2
Navicula cryptotenella	1	-
Navicula germainii	4	4
Navicula minima	5	7
Navicula peregrina	6	1
Navicula porifera	-	1
Navicula radiosa	1	-
Navicula rostellata	1	-
Navicula seminulum	6	18
Navicula symmetrica	5	-
Naviculaceae	8	-
Nitzschia sp.	10	2
Nitzschia amphibia	2	3
Nitzschia gracilis	1	-
Nitzschia palea	2	-

Opephora sp.	-	1
Planothidium delicatulum	1	-
Pleurosira laevis	-	1
Surirella sp.	4	3
Synedra ulna	3	-
Terpsinoe sp.	-	1
Thalassiosira sp.	16	46
Tryblionella levidensis	2	-
Chlorophycota		
Chlorella sp.	1	3
Closterium sp.	1	-
Cosmarium sp.	3	-
Oedogonium sp.	-	2
Scenedesmus bijuga	-	1
Cyanophycota		
Chroococcus sp.	-	1
Chroococcus limneticus	2	-
Jaaginema sp.	-	1
Oscillatoria limosa	1	-
Oscillatoria tenuis	6	2
Phormidium sp.	1	-
Planktothrix sp.	3	2
Pseudanabaena sp.	3	1
Schizothrix calcicola	1	2
Synechocystis sp.	4	-

Appendix K-1

Benthic macroinvertebrates collapsed taxa list and density (average number of individuals/m^2 rounded to the nearest individual, n = 4 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the Packaging Corporation of America facility and collected April 10, 2006. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	(avg # per m2) Control	(avg # per m2) Test
Annelida		
Oligochaeta		
Haplotaxida		
Nais communis complex	-	2
Arthropoda		
Arachnida		
Acariformes		
Limnesia sp.	3	-
Sperchonopsis sp.	3	-
Crustacea		
Amphipoda		
Hyalella azteca	-	6
Insecta		
Coleoptera		
Dineutus sp.	46	-
Dubiraphia vittata	-	2
Microcylloepus pusillus	2	-
Stenelmis sp.	18	6
Diptera		
Ablabesmyia mallochi	6	4
Ablabesmyia rhamphe grp.	2	2
Ceratopogonidae	8	-
Corynoneura sp.	-	566
Corynoneura lobata	9	-
Corynoneura sp. B Epler	113	-
Cricotopus annulator complex	-	18
Cricotopus bicinctus	25	86
Dicrotendipes neomodestus	6	29
*Hemerodromia*sp.	-	2
Labrundinia sp.	2	-
Labrundinia pilosella	-	6
Nanocladius sp.	2	4
Nilotanypus fimbriatus	23	-
Orthocladius annectens	2	12
Palpomyia/bezzia grp.	-	2
Parakiefferiella sp.	4	-
Parakiefferiella sp. B Epler	-	26
Parakiefferiella sp. E Epler	-	35
Pentaneura inconspicua	-	2
Polypedilum fallax	15	48
Polypedilum flavum	66	46
Polypedilum halterale grp.	-	4
Polypedilum illinoense grp.	-	4
Polypedilum scalaenum grp.	23	65
Rheocricotopus robacki	-	4
Rheotanytarsus exiguus grp.	141	43
Rheotanytarsus pellucidus	2	-
Stelechomyia perpulchra	2	-

Stenochironomus sp.	-	6
Tanytarsus sp. A Epler	11	45
Tanytarsus sp. C Epler	77	138
Tanytarsus sp. L Epler	-	4
Tanytarsus sp. M Epler	2	6
Tanytarsus sp. S Epler	-	6
Thienemanniella lobapodema	60	320
Thienemanniella sp. B Epler	2	2
Thienemannimyia grp.	13	2
Tvetenia vitracies	6	-
Ephemeroptera		
Caenis sp.	-	2
Isonychia sp.	2	-
Maccaffertium exiguum	80	26
Pseudocloeon propinquum	-	36
Tricorythodes albilineatus	14	28
Megaloptera		
Corydalus cornutus	2	-
Plecoptera		
Neoperla clymene	32	70
Trichoptera		
Cheumatopsyche sp.	6	-
Cyrnellus fraternus	6	22
Hydropsyche sp.	27	2
Hydroptila sp.	50	23
Nectopsyche sp.	4	-
Neotrichia sp.	41	29
Oecetis sp.	8	-
Oecetis persimilis	-	6
Mollusca		
Bivalvia		
Bivalvia		
Undetermined Bivalvia	2	2
Gastropoda		
Basommatophora		
Ancylidae	-	4
*Ferrissia*sp.	4	-

Appendix K-2

Benthic macroinvertebrates taxa list and counts (number of individuals counted) collected from Hester-Dendy artificial substrates (n= 4 samples) incubated upstream and downstream of the Packaging Corporation of America facility for 28 days and collected April 10, 2006.

Phylum	(# counted) Control	(# counted) Test
Annelida		
Oligochaeta		
Haplotaxida		
Nais communis complex	-	1
Arthropoda		
Arachnida		
Acariformes		
Undetermined Acariformes	1	-
Limnesia sp.	1	-
Sperchonopsis sp.	1	-
Crustacea		
Amphipoda		
Hyalella azteca	-	3
Insecta		
Coleoptera		
Dineutus sp.	23	-
Dubiraphia vittata	-	1
Microcylloepus pusillus	1	-
Stenelmis sp.	9	3
Diptera		
Ablabesmyia mallochi	3	2
Ablabesmyia rhamphe grp.	1	1
Ceratopogonidae	4	-
Chironomidae	13	20
Corynoneura sp.	20	278
Corynoneura lobata	3	-
Corynoneura sp. B Epler	36	-
Cricotopus sp.	7	5
Cricotopus annulator complex	-	8
Cricotopus bicinctus	5	38
Dicrotendipes sp.	-	1
Dicrotendipes neomodestus	3	13
Hemerodromia sp.	-	1
Labrundinia sp.	1	-
Labrundinia pilosella	-	3
Nanocladius sp.	1	2
Nilotanypus sp.	1	-
Nilotanypus fimbriatus	10	-
Orthocladius annectens	1	6
Palpomyia/bezzia grp.	-	1
Parakiefferiella sp.	2	-
Parakiefferiella sp. B Epler	-	13
Parakiefferiella sp. E Epler	-	17
Pentaneura inconspicua	-	1
Polypedilum sp.	-	5
Polypedilum fallax	7	22
Polypedilum flavum	32	21
Polypedilum halterale grp.	-	2

Polypedilum illinoense grp.	-	2
Polypedilum scalaenum grp.	11	30
Rheocricotopus robacki	-	2
Rheotanytarsus exiguus grp.	68	21
Rheotanytarsus pellucidus	1	-
Stelechomyia perpulchra	1	-
Stenochironomus sp.	-	3
Tanytarsus sp.	4	1
Tanytarsus sp. A Epler	5	22
Tanytarsus sp. C Epler	34	67
Tanytarsus sp. L Epler	-	2
Tanytarsus sp. M Epler	1	3
Tanytarsus sp. S Epler	-	3
Thienemanniella sp.	2	9
Thienemanniella lobapodema	27	148
Thienemanniella sp. B Epler	1	1
Thienemannimyia grp.	6	1
Tvetenia sp.	1	-
Tvetenia vitracies	2	-
Ephemeroptera		
Baetidae	-	2
Caenis sp.	-	1
Heptageniidae	6	-
Isonychia sp.	1	-
Leptohyphidae	2	-
Maccaffertium sp.	25	3
Maccaffertium exiguum	9	10
Pseudocloeon sp.	-	8
Pseudocloeon propinquum	-	8
Tricorythodes albilineatus	5	14
Megaloptera		
Corydalus cornutus	1	-
Plecoptera		
Neoperla clymene	15	35
Perlidae	1	-
Trichoptera		
Cheumatopsyche sp.	2	-
Cyrnellus fraternus	3	9
Hydropsyche sp.	9	1
Hydropsychidae	5	-
Hydroptila sp.	25	11
Hydroptilidae	-	1
Nectopsyche sp.	2	-
Neotrichia sp.	20	14
Oecetis sp.	4	1
Oecetis persimilis	-	2
Polycentropodidae	-	2
Undetermined Trichoptera	1	-
Mollusca		
Bivalvia		
Bivalvia		
Undetermined Bivalvia	1	1
Gastropoda		
Basommatophora		
Ancylidae	-	2
Ferrissia sp.	2	-

Appendix L-1

Qualitative benthic macroinvertebrate collapsed taxa list and number of individuals counted from 20-discrete-dipnet sweeps upstream and downstream of Packaging Corporation of America facility (April 10, 2006). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

Phylum	(# counted) Control	(# counted) Test
Annelida		
Oligochaeta		
Haplotaxida		
Dero vaga	-	1
Stylaria lacustris	-	1
Tubificidae	2	4
Arthropoda		
Arachnida		
Acariformes		
Albia sp.	1	-
Arrenurus sp.	-	1
Frontipoda sp.	2	-
Geayia sp.	11	-
Lebertia sp.	-	1
Neumania sp.	-	1
Crustacea		
Amphipoda		
Hyalella azteca	10	16
Decapoda		
Palaemonetes sp.	4	5
Isopoda		
Caecidotea sp.	2	2
Insecta		
Coleoptera		
Curculionidae	1	-
Dubiraphia vittata	2	3
Hydrocanthus sp.	-	1
Microcylloepus pusillus	12	3
Stenelmis sp.	2	-
Collembola		
Undetermined Collembola	-	1
Diptera		
Ablabesmyia mallochi	3	2
Ablabesmyia rhamphe grp.	3	1
Ceratopogonidae	1	2
Cladotanytarsus cf. *daviesi*	3	1
Cladotanytarsus sp. F Epler	-	1
Corynoneura sp.	-	1
Cricotopus sp.	1	-
Cricotopus bicinctus	-	2
Cricotopus or *orthocladius*	-	2
Cryptochironomus sp.	-	1
Dicrotendipes neomodestus	-	1
Labrundinia pilosella	1	-
Nanocladius sp	1	-
Paracladopelma loganae	1	-
Parakiefferiella sp. E Epler	3	-
Polypedilum illinoense grp.	-	8
Polypedilum scalaenum grp.	-	1
Rheotanytarsus exiguus grp.	-	1

Stelechomyia perpulchra	-	1
Stempellina sp. A Epler	1	-
Stenochironomus sp.	-	1
Tanytarsus sp. C Epler	-	1
Tanytarsus sp. L Epler	1	-
Xenochironomus xenolabis	1	2
Xestochironomus sp.	6	2
Ephemeroptera		
Acerpenna pygmaea	-	1
Caenis sp.	-	1
Maccaffertium exiguum	-	1
Pseudocloeon sp.	-	3
Pseudocloeon propinquum	1	-
Stenacron sp.	-	1
Tricorythodes albilineatus	-	1
Odonata		
Argia sedula	1	-
Macromia illinoiensis georgina	1	-
Trichoptera		
Ceraclea sp.	-	1
Hydroptila sp.	1	1
Nectopsyche exquisita	5	-
Neotrichia sp.	-	6
Oxyethira sp.	1	-
Mollusca		
Bivalvia		
Veneroida		
Corbicula fluminea	5	2
Sphaeriidae	2	2
Gastropoda		
Basommatophora		
Ancylidae	-	1
Micromenetus sp.	6	5
Mesogastropoda		
Hydrobiidae	1	-
Viviparus georgianus	-	3
Nemertea		
Enopla		
Hoplonemertea		
Prostoma *sp.*	-	1
Platyhelminthes		
Platyhelminthes		
Platyhelminthes		
Udetermined Platyhelminthes	1	-

Appendix L-2

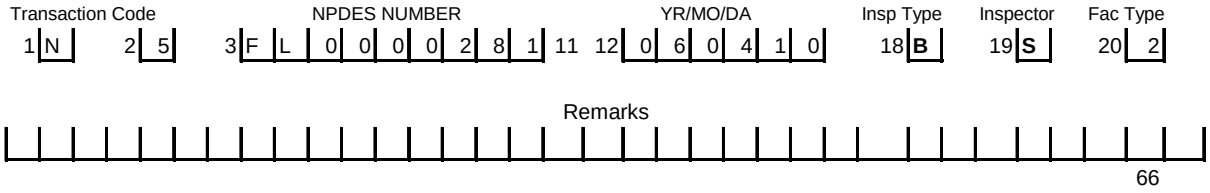
Qualitative benthic macroinvertebrate taxa list and number of individuals counted from 20-discrete-dipnet sweeps upstream and downstream of Packaging Corporation of America facility (April 10, 2006).

Phylum	(# counted) Control	(# counted) Test
Annelida		
Oligochaeta		
Haplotaxida		
Dero vaga	-	1
Stylaria lacustris	-	1
Tubificidae	2	4
Arthropoda		
Arachnida		
Acariformes		
Albia sp.	1	-
Arrenurus sp.	-	1
Frontipoda sp.	2	-
Geayia sp.	11	-
Lebertia sp.	-	1
Neumania sp.	-	1
Crustacea		
Amphipoda		
Hyalella azteca	10	16
Decapoda		
Palaemonetes sp.	4	5
Isopoda		
Caecidotea sp.	2	2
Insecta		
Coleoptera		
Curculionidae	1	-
Dubiraphia vittata	2	3
Hydrocanthus sp.	-	1
Microcylloepus pusillus	12	3
Stenelmis sp.	2	-
Collembola		
Undetermined Collembola	-	1
Diptera		
Ablabesmyia mallochi	2	2
Ablabesmyia rhamphe grp.	2	1
Ceratopogonidae	1	2
Chironomidae	7	3
Cladotanytarsus sp.	1	-
Cladotanytarsus cf. *daviesi*	1	1
Cladotanytarsus sp. F Epler	-	1
Corynoneura sp.	-	1
Cricotopus sp.	1	1
Cricotopus bicinctus	-	1
Cricotopus or *orthocladius*	-	2
Cryptochironomus sp.	-	1
Dicrotendipes neomodestus	-	1
Labrundinia pilosella	1	-
Nanocladius sp.	1	-
Paracladopelma loganae	1	-
Parakiefferiella sp.	1	-
Parakiefferiella sp. E Epler	1	-
Polypedilum illinoense grp.	-	5

		Polypedilum scalaenum grp.	-	1
		Rheotanytarsus exiguus grp.	-	1
		Stelechomyia perpulchra	-	1
		Stempellina sp. A Epler	1	-
		Stenochironomus sp.	-	1
		Tanytarsus sp. C Epler	-	1
		Tanytarsus sp. L Epler	1	-
		Xenochironomus xenolabis	1	2
		Xestochironomus sp.	3	2
	Ephemeroptera			
		Acerpenna pygmaea	-	1
		Baetidae	-	1
		Caenis sp.	-	1
		Maccaffertium exiguum	-	1
		Pseudocloeon sp.	-	2
		Pseudocloeon propinquum	1	-
		Stenacron sp.	-	1
		Tricorythodes albilineatus	-	1
	Odonata			
		Argia sedula	1	-
		Macromia illinoiensis georgina	1	-
	Trichoptera			
		Ceraclea sp.	-	1
		Hydroptila sp	1	1
		Nectopsyche sp.	1	-
		Nectopsyche exquisita	3	-
		Neotrichia sp.	-	6
		Oxyethira sp.	1	-
		Undetermined Trichoptera	1	-
Mollusca				
	Bivalvia			
		Veneroida		
			Corbicula fluminea	5	2
			Sphaeriidae	2	2
	Gastropoda			
		Basommatophora		
			Ancylidae	-	1
			Micromenetus sp.	6	5
		Mesogastropoda		
			Hydrobiidae	1	-
			Viviparus georgianus	-	3
Nemertea				
	Enopla			
		Hoplonemertea		
			Prostoma sp.	-	1
Platyhelminthes				
	Platyhelminthes			
		Platyhelminthes		
			Undetermined Platyhelminthes	1	-

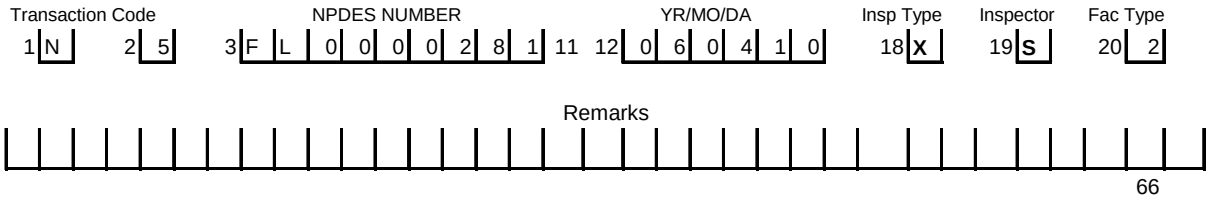
The Bioassay of the Packaging Corporation of America, Valdosta Operation, (fka Tenneco) effluent sampled on April 10, 2006, NPDES #FL0000281

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



The Priority Pollutants Analysis for Bioassay of the Packaging Corporation of America, Valdosta Operation, (fka Tenneco) effluent sampled on April 10, 2006, NPDES #FL0000281

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



Biological Analyses of the Packaging Corporation of America, Valdosta Operation, (fka Tenneco) effluent sampled on April 10, 2006, NPDES #FL0000281

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

