

A Biological Assessment of the Suwannee River: Patterns Associated With the Dilution Gradient for Effluent from the Gold Kist, Inc. - Poultry Division NPDES Discharge Suwannee County NPDES #FL0001465 Sampled December 2001 and January 2002

October 2002

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Comprehensive Quality Assurance Plan No. 870346G

Florida Department of Environmental Protection
Fifth Year Inspection Summary

Discharger:	Gold Kist Inc. – Poultry Division
County:	Suwannee
NPDES Number:	FL0001465
Permit Expiration:	October 26, 2002

Toxics Sampling Inspection (XSI)

Date Sampled: 15 January 2002

Results: Copper and nickel were detected in the effluent at levels that complied with Class III standards. No organic constituents were detected in the effluent.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 15 January 2002

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 15 January 2002

Results: Qualitative measures of macroinvertebrate community health demonstrated impairment at downstream sites. Both upstream sites received Stream Condition Index (SCI) scores of 27, placing them in the "excellent" category while downstream sites received scores of 17 and 20, placing them in the "poor" category. These results indicate imbalances in the invertebrate communities and violate Class III Water Quality Standards **Rule 62-302.530(48)(b) FAC:** "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna" and appear related to extreme elevations in test site nutrients as a result of the Gold Kist outfall. The SCI scores may also be related to unidentified toxicants in the effluent and if so, violated **Rule 62-302.530(62) FAC:** "Substances in concentrations which injure, are chronically toxic to, or produce adverse behavioral responses in humans, plants or animals – None shall be present".

Although qualitative algal collections were similar in species compositions upstream and downstream, algal communities downstream of the outfall were significantly longer and denser, suggesting conditions more conducive to rapid growth and the formation of nuisance algal mats. These results indicate violations of **Rule 62-302.530(47)** which states "Substances in concentrations which result in the dominance of nuisance species: none shall be present," and **Rule 62-302.530(48)(b) FAC:** "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna".

Water Quality Inspection (WQI)

Date Sampled: 15 January 2002

Results: Effluent conductivity was 1,740 µmhos/cm and exceeded the Class III Water Quality Standard **Rule 62-302.530(23) FAC**. Fecal and total coliforms complied with Class III Water Quality Standards at all sites. There were significant increases in nitrate+nitrite, total phosphorus and ortho-phosphorus downstream of the outfall. Extremely high levels of nitrite+nitrate (99.0, 89.0 mg/L in December and January, respectively), total phosphorus (13.0, 13.0 mg/L) and ortho-phosphorus (13.0, 13.0 mg/L) in the effluent were directly linked to increases in nutrient levels downstream of the outfall using rhodamine dye measurements of effluent dilution gradients. Algal growth potential (AGP) values were approximately five times the nuisance threshold of 5.0 mg dry weight/L upstream of the outfall and increased to more than 25 times the nuisance threshold downstream of the outfall. Effluent AGP was also elevated, but there was evidence of significant growth inhibition in, and immediately downstream of, the outfall. AGP results linked with the nutrient gradient associated with the Gold Kist outfall further support the assertion that the discharge violated **Rule 62-302.530(48)(b) FAC** in the Suwannee River.

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

This is a report of the effects of the Gold Kist Poultry Processing Plant effluent on the biological communities in the Suwannee River. Previous biological assessments have demonstrated high levels of nutrients associated with the Gold Kist outfall (Florida Department of Environmental Protection, 1995, 2001). However, due to the high flow volume of the Suwannee River (approximately 5,500 cubic feet per second during the sampling period, USGS water level data, long term average is 6,508 cubic feet per second, USGS gauge at Ellaville), acidic water chemistry and high color, the effects of increased nutrients on biological communities have been difficult to determine (Florida Department of Environmental Protection, 1995, 2001). The current assessment was designed to detect effects of the outfall despite the size of the receiving water body and its physical-chemical characteristics. This assessment used rhodamine dye to determine the path and dilution rate of the effluent plume downstream of the outfall. Sampling stations were placed along this dilution gradient to correlate physical, biological and chemical results with effluent concentration.

Plant Description and Permit Limits

The Gold Kist, Inc. Poultry Division is located in Suwannee County, Florida on Highway 90 near the City of Live Oak (Appendix 1). This facility is an industrial wastewater treatment facility. Wastewater is generated from poultry processing, rendering of byproducts, hatchery operations, sanitary wastewater, equipment wash-down water and stormwater (see Facility Summary in Appendix 2). Industrial wastewater treatment consists of primary and secondary screening, flow equalization, chemical coagulation/flocculation, dissolved air flotation, anaerobic digestion, aerobic/anoxic digestion, secondary clarification, a polishing pond, sand filtration, pH adjustment and chlorination/dechlorination. Sludge from the activated sludge process is aerobically digested and land applied to a sprayfield. The effluent is continuously discharged via an 18 inch steel pipe, located on the east bank, into the Class III freshwater of the Suwannee River, an Outstanding Florida Waterbody. During the survey, the discharge pipe was above the water level. The design flow of the wastewater system is 1.7 million gallons per day (MGD) with a mean flow of 1.5 MGD. The actual mean flow during this survey was 1.546 MGD (M. Long, FDEP, Northeast District, personal communication).

State permit limits for the Gold Kist, Inc. Poultry Division are listed in Appendix 2; Water Quality Limits follow Florida Administrative Code (FAC) 62-302. According to the facility's Monthly Operating Reports, the plant has reported a pH of 5.6 S.U., lower than the permit limit of 6.0 S.U. (November 2001) and has triggered the anti-degradation clause in their permit with a maximum daily flow of greater than 1.7 MGD (Appendix 2).

Methods

The purpose of this investigation was to determine if the facility's effluent was having adverse effects on the receiving waters. Chemical and biological comparisons were made between upstream control sites (located approximately 30-200 meters (m) upstream of the discharge) and downstream test sites (located approximately 0-210 m downstream of the discharge). A habitat assessment was performed *in situ* to compare upstream and downstream sites. Supplemental physical and chemical data were collected on the effluent and at upstream and downstream study sites. Data for this report were collected on December 18, 2001 and January 15, 2002. Methods used for all chemical and biological analyses are on file at the DEP Central Laboratory in Tallahassee and may be viewed on the web at <www.floridadep.org/pubs/labs/qa/sops.htm >.

The following personnel were involved in this investigation P. O'Connor and J. Richarde (DEP Northeast District), and M. Chen, K. Espy, M. Hua, M. Heyn, J. Jackson, S. Levings, U. Quintana, J. Richardson, J. Riley, G. Schmitt, D. Whiting and S. Wolfe (DEP Central Laboratory in

Tallahassee). The report was reviewed by District representatives and the Point Source Studies Review Committee (W. Magley, C. Ziegmont and M. Tanski).

Establishment of effluent plume, dilution gradient and location of sampling locations

Rhodamine dye is a fluorescent dye that can be detected at very low concentration (ppb) with a fluorometer (www.turnerdesigns.com/t2/doc/appnotes). Fluorometer readings of rhodamine dye are directly proportional to the concentration of the dye in the water sampled. When rhodamine dye is continuously fed into the waste stream of a point source facility, the effluent plume can be directly tracked and the dilution of the effluent measured by sampling dye concentration at multiple points in the receiving water (Wilson et al. 1986).

Data were collected at the Gold Kist Poultry Processing Plant outfall in the Suwannee River on December 18, 2001 and January 15, 2002. On both visits, rhodamine dye was fed into the facility's waste stream at the NPDES sampling point in the outfall pipe located approximately 200 m from the point of discharge (POD). Using a fluorometer, the effluent plume was tracked downstream from the POD to establish the dilution gradient of the effluent in the receiving water (Wilson et al. 1986).

Collection and analysis of toxicity, water chemistry, BOD and AGP samples

On both sampling dates, physical-chemical measurements and water samples for determination of nutrient levels, biochemical oxygen demand (BOD), and algal growth potential (AGP) were collected from each sampling location (Figure 1); samples were analyzed in the laboratory following FDEP SOPs.

Effluent samples were collected for different analyses on December 18, 2001 and January 15, 2002. On December 18, 2001, effluent was collected and analyzed for nutrients, BOD and AGP. On January 15, 2002, the effluent was collected and analyzed for BOD, AGP, nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides. Levels of chemical constituents were compared with Water Quality Limits (FAC 62-302) and facility permit limits (Table 1, Appendix 2).

Acute screening toxicity bioassays were performed on the January 15, 2002 effluent sample using the water flea, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* (Weber 1993). The effluent and water from control and test sites were analyzed for the presence and concentration of total and fecal coliform bacteria (APHA 1992, methods 9222 B, 9222 D).

Placement and collection of periphytometers and Hester-Dendy samplers

For placement of periphytometers and Hester-Dendy multi-plate samplers, sampling locations were established downstream at effluent dilutions of 12%, 6%, and 2% during the initial sampling event and deployment in December 2001 (Figure 1). Locations were chosen at approximate halvings of effluent concentration in the receiving water. Upstream sampling locations were located 30 m and 100 m upstream of the outfall. At each location, two stations (A and B) were located approximately 3-4 m apart, with the station closest to the east bank placed approximately 4-5m from the bank. The sampling locations were marked with buoys and GPS coordinates were recorded for each sample point. Observations were recorded during each visit on the movement of the effluent plume and any associated eddying.

On December 18, 2001, a block containing three Hester-Dendy multi-plate samplers was placed at each sampling point (Figure 1). Hester-Dendy multi-plate samplers are used to quantitatively estimate macroinvertebrate settlement upstream and downstream of discharges. These samplers were deployed at all ten sampling locations, and incubated for 28 days (method

modified from APHA 1992, method 10500.5). Each block had an attached line and buoy to which a standard periphytometer with eight clean slides was attached. Periphyton were sampled at both control and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (APHA 1992, method 1033).

On January 15, 2002, all periphytometers (n=10) and nine of the ten Hester-Dendy blocks were recovered. In addition, invertebrates were collected from each periphytometer where they were present, and notes made on the approximate number of grazers and the condition of the periphytometer racks. Two sets of two slides from the periphytometers were randomly selected and placed in sample tubes for determination of chlorophyll *a* content. The remaining four slides were placed in separate vials for examination of periphyton assemblages.

Collection of Stream Condition Index Samples and Habitat Assessment Scoring

In January, qualitative macroinvertebrate samples were collected using 20 discrete dipnet sweeps of multiple substrates (*e.g.*, snags, leaf packs, rock) at two control sites upstream from the outfall and two test sites downstream from the outfall (Figure 1). Each of these sites overlapped the positions of the Hester-Dendy samplers. One control SCI sample was collected on the west bank of the Suwannee River beginning about 30 m upstream of the discharge (Control 30 SCI), and the other control site was collected on the east bank of the Suwannee River beginning 100 m upstream of the discharge (Control 100 SCI). Test site SCI samples were collected on the east bank of the Suwannee River from 10-110 m downstream of the outfall (Test 10 SCI) and 110-210 m downstream of the outfall (Test 110 SCI). All macroinvertebrate samples were returned to the laboratory, sorted and identified to the lowest practical taxonomic level.

Habitat assessments were done *in situ* to establish comparability and examine the physical structure and extent of disturbance at the study sites. These assessments assist in determining the most productive habitats for benthic macroinvertebrates that are then sampled for the Stream Condition Index.

Estimation of periphyton percent cover on natural substrate and periphyton identification

Nutrient enrichment can increase the amount of substrate covered with algae and increase the average size of algae, often resulting in nuisance algal growth when nutrient levels are high (Stevenson and Bahls 1999). To assess potential effects of the Gold Kist outfall on natural periphyton assemblages, we measured percent cover of algae of different size classes up- and downstream of the outfall. Percent cover methods have been extensively used to measure the amount of substrate covered by plants and animals in both marine and freshwater systems (Cubit 1984, Stevenson and Bahls 1999).

Percent cover of periphyton on natural substrate was collected using stratified random sampling upstream and downstream of the outfall on both site visits. A transect tape was laid parallel to the river; within each 10 m section of the shoreline two positions were randomly selected. If the selected location could not be sampled because it did not meet two sampling criteria, it was discarded and a new random number selected. Sampling criteria were (1) if water depth was <20 cm and (2) if the angle of the substrate was <45 degrees from horizontal. Sampling criteria were chosen to minimize physical differences among locations sampled (e.g. light availability, flow) and to ensure that all samples were taken under conditions where size classes of algae could be reliably determined. Sampling extended 100 m upstream and approximately 140 m downstream from the POD. The shoreline topography changed beyond 140 m downstream from the POD, and it no longer met the criteria for sampling.

A 25x25 cm quadrat, with 25 - 0.5 cm circles located in a stratified random array, was haphazardly placed on the substrate at each position within <50 cm of the water's edge, and what lay under the center of each circle was recorded. Percent cover was recorded in five semi-quantitative categories: (1) no visible periphyton, (2) periphyton visible, but ≤1 mm long, (3) >1<10

mm long, (4) 10-50 mm long, and (5) >50 mm long. A ruler marked in mm was used to check category assignment.

Qualitative collections for identification of algae in periphyton were made using stratified random sampling. In seven 10 m stretches of shoreline, a centimeter from 0-50 was randomly selected within each meter. At that location, we arbitrarily sampled by reaching out within areas that met sampling criteria, and collecting a scrape of whatever algae were present. Within each 10 m segment, all scrapes were combined. Collections were made at 0-10 m, 50-60 m, 100-110 m and 130-140 m downstream, and 0-10 m, 50-60 m and 90-100 m upstream.

In the laboratory, samples were manually separated into size classes matching those recorded in the field and identified to the lowest practical taxonomic level.

Statistical analyses

Statistical analyses were chosen based on the type of data analyzed. Chlorophyll *a* values from periphytometers were analyzed for the effect of grazer presence/absence using Fisher's Exact Test, separating chlorophyll *a* values ≤50 and >51 mg/m^2, compared with samples with >25 and <26 invertebrates present. Fisher's Exact Test was chosen because sample size was 10, and other possible tests (i.e. chi square) are unreliable for small sample sizes (Winer 1971). AGP was analyzed with two-way analysis of variance (date by location), transformed as necessary to meet the assumptions of analysis of variance (ANOVA). Two-way ANOVA was chosen because samples were taken on two dates at five different locations.

Physical and chemical parameters were analyzed using Principal Components Analysis. Principal Components Analysis (PCA) is a multivariate statistical technique that combines variables into orthogonal axes, oriented to produce the best fitting axes in multivariate space. The linear combinations of variables that provide the best fit are used to estimate how well the PCA describes the data. This is summarized as the percent of variance explained; a PCA that describes the data well will have >75% of the variance explained in the first two axes (Clarke and Warwick 2001). Data were transformed to eliminate skewness as necessary and normalized before analysis, following recommendations in Clarke and Warwick (2001).

Statistical analyses were performed using either Statistica™ or Primer™ statistical software. Summary tables and figures are presented in the text with detailed results and analyses placed in appendices.

Results and Discussion

Chemical, toxicological and microbiological results from effluent and control and test site water samples

Chemical results are reported in Table 1 and Appendix 3. Copper and nickel were detected in the effluent at levels that complied with Class III Water Quality Standards (FAC 62-302). No organic pollutants were detected in the effluent.

Effluent conductivity was 1,740 µmhos/cm and exceeded the Class III Water Quality Standard **(Rule 62-302.530(23) FAC,** Table 1). Conductivity was elevated in the receiving water by approximately 25% at Test Sites 6A and 6B (near field sites), only dropping to upstream levels by Test 1A and 1B.

Dissolved oxygen (DO as mg/L), water temperature (degrees Celsius), turbidity (NTU units), total suspended solids (mg/L) and pH (Standard Units) at test and control sites were within normal ranges and complied with Class III Water Quality Standards (Table 1, FAC 62-302, see also Appendix 3).

Microbiological results (BOD, fecal and total coliforms) complied with permit limits and Class III Water Quality Standards (Table 1, Appendix 3). No toxicity was indicated in the acute screening toxicity bioassays using the water flea, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi* (Table 1, Appendix 3).

Establishment of effluent plume, dilution gradient and location of sample points

On each site visit, the river level was approximately 30–50 cm below the discharge pipe. The effluent plume hugged the east shore of the river. Eddies formed both immediately up and downstream from the POD. Strong winds intermittently pushed the foam from the effluent plume upstream at least 20 m during each site visit. The width of the effluent plume shifted over time.

Nutrient measurements indicated that at the furthest downstream location (Test 1A, 1B), the sample point further from shore (1B) was only intermittently in the plume (Table 1, Appendix 3). Dye dilution patterns were similar on both dates (Table 2).

The control sites closest to the outfall, 30m upstream (Control 30A, 30B), were out of range of upstream eddies. Downstream test sites were located at approximately 12%, 6% and 2% of effluent in December; corresponding values in January were 12%, 3.5% and <0.5% of effluent (Table 2).

Physical and chemical gradients related to the outfall

Physical and chemical data were analyzed using Principal Component Analysis (PCA) following Clarke and Warwick (2001). Nutrients analyzed included ammonia, nitrate plus nitrite, total Kjeldahl nitrogen and total phosphorus. Physical variables included temperature, dissolved oxygen, pH, turbidity and conductivity. December 2001 and January 2002 data were analyzed separately. Results were similar on both dates, clearly reflecting the strong gradient associated with the Gold Kist outfall (Appendix 4).

Sites were ordered by location, with highest nutrient levels associated with the outfall gradient and ambient levels upstream of the outfall. Figure 2A and 2B show ortho- phosphorus and nitrate plus nitrite gradients upstream and downstream of the outfall. Concentrations of nutrients released by the outfall were strongly correlated with the dye dilution gradient (Figure 3: A-D, Appendix Table 4.3).

Variation in algal growth potential with distance from the outfall

Algal growth potential (AGP) is a bioassay in which the unicellular green alga, *Selenastrum capricornutum*, is grown under defined conditions (Miller et al. 1978). Water samples are collected from the location to be tested, autoclaved, filtered (0.45μm), inoculated with the *Selenastrum* culture and incubated for 14 days. The algal growth potential value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L (Miller et al. 1978). Values above 5.0 mg dry weight/L represents a "problem threshold" for fresh receiving waters, implying nutrient enrichment (Raschke and Schultz 1987).

Sample points upstream of the outfall had significantly lower AGP than those receiving effluent (Figure 4) in both December 2001 and January 2002 (Appendix 5). AGP increased by approximately a factor of five at Test 6A, 6B and Test 3A, 3B immediately downstream of the outfall, but was intermediate at Test1A, 1B (Table 3).

It is possible to calculate the expected yield (AGP value) based on the concentration of nutrients in the water tested (Miller et al. 1978). This analysis assumes that other required compounds (e.g. silicon, micronutrients) are present in excess, and that either nitrogen or phosphorus is limiting algal growth. The expected amount of algal production in mg dry weight/L is calculated as 38 times total soluble inorganic nitrogen (TSIN, nitrate and nitrite plus ammonia) concentration or 430 times ortho-phosphorus (OP) concentration. Both estimates have an error of ± 20% (Miller et al. 1978). If the nitrogen (N) to phosphorus (P) ratio is less than 11:1, then it is probable that N is limiting algal growth rather than P (Miller et al. 1978). In the vicinity of the Gold Kist outfall, N:P ratios were ≤8.1 (Table 1, Appendix Table 5.2), making N limitation likely.

Upstream of the outfall, all eight AGP measurements were at or slightly above expected values (Figure 5, Appendix 5). TSIN values of approximately 0.45 mg/L were associated with approximately 25 mg dry weight/L AGP. On both dates, effluent AGP measurements were <1.5% of expected (<55.0 measured vs. >3000 estimated mg dry weight/L); TSIN levels in the effluent

were 90-100 mg/L, approximately 200 times as much as background levels upstream. Downstream of the outfall, sample points close to the outfall produced less biomass than expected (Test 6A, 6B, three of four AGP less than expected), but by the time effluent was diluted to <0.5-2.5% at Test 1A and 1B, all values were at or slightly above expected levels. This lower than expected production near the outfall occurred despite the five-fold increase in AGP at Test 6A, 6B and Test 3A, 3B. Overall, predicted and observed AGP were significantly, but weakly, correlated ($r=0.534$, $p<0.01$, $n=22$), despite the lower than expected production.

These data suggest that the Suwannee River upstream of the Gold Kist outfall was already experiencing negative effects of eutrophication. AGP values were approximately five times the nuisance threshold level (5.0 mg dry weight/L) suggested by Raschke and Schultz (1987). However, below the outfall, AGP values increased by another factor of five, to levels more than 25 times the nuisance threshold. This occurred despite evidence of growth inhibition at high levels of effluent concentration. These results indicate violation of **FAC 62-302.530(48)(b)**: "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna". Inhibition of AGP at high effluent concentration may also be related to the presence of unidentified toxicants in the effluent. If growth inhibition is present, this indicates violation of **FAC 62-302.530(62)**: "Substances in concentrations which injure, are chronically toxic to, or produce adverse behavioral responses in humans, plants or animals – None shall be present".

Periphytometer estimates of production (Chlorophyll *a*)

When collected, seven of ten periphytometers had been colonized by a large number of invertebrate grazers (Table 4). All six periphytometers downstream of the outfall and one of four periphytometers upstream of the outfall were affected. Collections and /or approximate counts of grazers were made during retrieval (Appendix 7).

We examined the relationship between the presence of grazers and chlorophyll *a* levels and found that chlorophyll *a* levels were significantly lower in the presence of grazers than when grazers were absent (Table 4). Because estimates of production from periphytometers were confounded by the presence of grazers, chlorophyll *a* measurements were not used to test for effects of nutrient enrichment from the Gold Kist outfall. Because grazing would also confound interpretation of periphyton community assessments, slides collected for algal identification were not processed.

Estimation of periphyton percent cover and periphyton identification

Periphyton was visible on >99% of shoreline both up- and downstream of the Gold Kist outfall pipe on both dates. Qualitative collections showed the same algal assemblages upstream and downstream. In the >1 mm size classes, the green algae *Rhizoclonium, Hydrodictyon, Dichmosiphon, Cladophora, Microspora* and *Oedigonium* species were mixed with blue-green algae including *Oscillatoria, Lyngbya, Anabaena* and *Calothrix*. In the ≤ 1mm collections, the same complex of species was present, along with diatoms and a variety of other taxa (Appendix 6).

In contrast, the size classes of algae attached to the substrate differed upstream and downstream (Figure 6). Upstream of the outfall, most algae were <10mm long. Algae formed turfs of varying length, growing through consolidated sediments or on hard rock surfaces. There were occasional patches of longer filaments, especially immediately upstream of the outfall in the region where effluent eddies were noted. Downstream of the outfall, >60% of the substrate for approximately 120 m was covered with algae >10 mm long on both dates. By the end of the transect (120-140 m downstream), percent cover of algae >10 mm long was falling to levels closer to that found upstream out of the effluent plume.

These results indicate a violation of **FAC 62-302.530(48)(b)**: "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna". Results also indicate a violation of **FAC 62-302.530(47)**: "Nuisance species: Substances in concentrations which result in dominance of nuisance species:

None shall be present". Increased coverage of algal mats below the outfall indicates dominance of nuisance species and an imbalance in algal populations.

Results of Qualitative Macroinvertebrate Samples: Stream Condition Index

Qualitative dipnet samples were used to calculate Stream Condition Index (SCI) values (Barbour et al. 1996, FDEP 1996). Habitat assessments at the upstream control sites (Control 30 SCI, Control 100 SCI) and downstream test sites (Test 10 SCI, Test 110 SCI) were all "optimal", ranging from 138 (Test 10 SCI) to 148 (Test 110 SCI); Habitat Assessment Sheets are included in Appendix 8.

Through reanalysis of past data, it has been determined that sample size (number of invertebrates identified) may bias bioassessment metrics based on counts of taxa (Biology Section, in preparation). For example, taxa richness, Florida Index, chironomid taxa and EPT taxa are count metrics and are four of the seven measures making up the composite Stream Condition Index. Therefore, it is important to equalize sample size (number of individuals identified) when comparing study sites. Values presented here are based on electronic subsampling of each original sample with an organism count of >100. Each of the four qualitative samples was routinely processed in the lab. These data were then subjected to an electronic routine that randomly selected 100 organisms from the original sample data. This routine was done 100 times on each of the three qualitative samples with >100 organisms identified, generating 100 subsamples for each sampling location (Test 10 SCI, Test 110 SCI, Control 30 SCI). A new SCI value was calculated for each of these random subsamples. The 100 subsampled SCI values were averaged and are reported here (Table 5); original counts are in Appendix 8.

The two upstream control sites received a SCI score of 27, placing them in the "excellent" category (Table 5, Control 30 SCI was subsampled to a mean of 26.8, range 23-27). However, the two mean test site SCI values were 17 (Test 10 SCI, range 13-21) and 20 (Test 100 SCI, range 15-27), placing them in the "poor" category. The subsampled SCI values for Test 10 SCI ranged from "good" to "very poor" with 99 of 100 in the "poor" or "very poor" category. The subsampled SCI values for the Test 110 SCI site ranged from "poor" to "excellent" with 54 in the "poor" category.

These results indicate violation of **FAC 62-302.530(48)(b):** "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna". The SCI results showing a healthy benthic macroinvertebrate community above the outfall at two control sites (rated "excellent") and the impaired benthic macroinvertebrate community below the outfall at two test sites (rated "poor") provide clear evidence that this criterion has been violated.

The poor SCI scores downstream of the outfall may also be related to unidentified toxicants in the effluent. If so, this indicates a violation of **FAC 62-302.530(62)**: "Substances in concentrations which injure, are chronically toxic to, or produce adverse behavioral responses in humans, plants or animals – None shall be present".

Results of Quantitative Macroinvertebrate Samples: Hester-Dendy multi-plate samplers

Analysis of quantitative macroinvertebrate measures collected via Hester-Dendy multi-plate samplers was confounded with differences in water depth and light penetration between study sites. All samplers upstream of the outfall were in water 0.5-0.7 m deep; samplers downstream of the effluent were ≥1 m deep. Secchi depths were approximately 1.0 m, indicating that little light reached samplers downstream of the effluent while samplers upstream of the outfall had light levels high enough to support algal production. These differences may have affected invertebrate recruitment, confounding interpretation of results (raw data are given in Appendix 9).

Conclusions

Establishment of a dilution gradient and correlation of nutrients to algal community measures

- Nutrients were strongly correlated with the dye dilution gradient. Nutrient inputs from the effluent were associated with elevated levels at the test sites. For example, the nitrate plus nitrite concentration was 13-30 times greater at the test site closest to the outfall compared to sites upstream of the outfall (January 2002, December 2001 comparisons). Measures of algal growth and abundance were correlated with increases in nutrient levels associated with the outfall.

- Algal growth potential (AGP) values were approximately five times the nuisance threshold of 5.0 mg dry weight/L upstream of the outfall and increased to more than 25 times the nuisance threshold at downstream sites.

- Qualitative algal collections showed similar species compositions upstream and downstream; however, algae downstream of the outfall were significantly longer and grew more densely, suggesting conditions more conducive to rapid growth and the formation of nuisance algal mats.

These results indicate a violation of **FAC 62-302.530.(48)(b):** "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna". The increase in periphyton growth downstream of the outfall and the high algal growth potential downstream of the outfall indicate violation of this criterion.

Results also indicate a violation of **FAC 62-302.530.(47)**: "Nuisance species: Substances in concentrations which result in dominance of nuisance species: None shall be present". Increased coverage of algal mats below the outfall indicates dominance of nuisance species and imbalance in algal populations.

Effects of the outfall on macroinvertebrate health

- Qualitative measures of macroinvertebrate community health demonstrated impairment at downstream sites. Both upstream sites received Stream Condition Index (SCI) scores of 27, placing them in the "excellent" category while downstream sites received scores of 17 and 20, placing them in the "poor" category.

These results indicate violation of **FAC 62-302.530(48)(b):** "Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna". The SCI results showing a healthy benthic macroinvertebrate community above the outfall at two control sites (rated "excellent") and the impaired benthic macroinvertebrate community below the outfall at two test sites (rated "poor") provide clear evidence that this criterion has been violated.

The SCI scores may also be related to unidentified toxicants in the effluent, indicating violation of **FAC 62-302.530(62):** Substances in concentrations which injure, are chronically toxic to, or produce adverse behavioral responses in humans, plants or animals – None shall be present".

Effluent Conductivity

- Effluent conductivity was 1,740 µmhos/cm. Conductivity was elevated in the receiving water by approximately 25% at Test Sites 6A and 6B, only dropping to upstream levels by Test 1A and 1B.

Effluent conductivity exceeded the Class III Water Quality Standard and indicated violation of **Rule 62-302.530(23) FAC.**

Other Findings

- No toxicity was measured in the acute screening toxicity bioassays of an effluent sample using the water flea, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi*.

- Microbiological chemical and physical-chemical results complied with permit limits and Class III Water Quality Standards.

- Grazing invertebrates were observed on 70% (seven of ten) of periphyton racks. Because estimates of production from periphytometers were confounded by the presence of grazers, chlorophyll *a* measurements were not used to test for effects of nutrient enrichment from the Gold Kist outfall.

- Quantitative macroinvertebrate samples collected via Hester-Dendy multi-plate samplers were confounded with differences in water depth and light penetration between study sites and could not be used to test for effects of the Gold Kist outfall on macroinvertebrate recruitment.

Recommendations

- Impairment in the macroinvertebrate communities was detected 110 m-210 m downstream of the outfall at an effluent concentration of <2%. Impairment of algal communities was detected to at least 140 m downstream of the outfall, where observations ceased. In order for communities to fully recover to unimpaired conditions, effluent nutrients, particularly nitrate plus nitrite, should be reduced to current background levels.

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Table 1A. Chemical, physical, biological and microbiological results for effluent and study sites: December 2001.

	Effluent	Effluent Limits	Control Sites				Test Sites						
Component			30A	30B	100A	100B	1A	1B	3A	3A Dup	3B	6A	6B
Nutrients (mg/L)													
Ammonia	0.048 A	-	0.024	0.023	0.023	0.022	0.023	0.02 I	0.024	0.024	0.024	0.023	0.024 A
Un-ionized ammonia	-	<0.02**	0.0005	0.0003	0.0006	0.0003	0.0004	0.0002	0.0005	-	0.0005	0.0005	0.0006
Nitrate and nitrite	99 J	-	0.43 J	0.43 J	0.42 J	0.43 J	3.6 J	0.52 J	5.7 J	5.5 J	4.8 J	13 J	5.6 J
Total Kjeldahl nitrogen	1.8	15*	0.14 I	0.14 I	0.13 I	0.11 I	0.24 A	0.14 I	0.43	0.43	0.28	0.62	0.45
Nitrate nitrogen	96 Q	-	-	-	-	-	-	-	-	-	-	-	-
Total soluble inorganic nitrogen	99.05	-	0.45	0.45	0.44	0.45	3.62	0.54	5.72	5.52	4.82	13.02	5.62
Ortho-phosphate	13	-	0.23	0.23	0.24	0.24	0.64	0.58	0.87	1.0	0.93	1.6	1.5
Total phosphorus	13	-	0.22 A	0.22	0.24	0.23	0.63 A	0.23	0.93	0.95	0.79	1.9	0.99
Physical, Chemical and Biological Results													
Total suspended solids (mg/L)	-	46.2	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Turbidity (NTU)	-	-	0.5	0.6	0.6	0.4	0.55	0.6	0.6	0.6	0.65	0.7	0.65
Color (PCU)	-	-	10	10	10	10	15	15	10	10	10	10	10
Conductivity (µmhos/cm)	-	1275	300	300	300	299	275	281	338	-	330	355	388
Dissolved oxygen (mg/L)	-	5.0	8.0	8.0	8.1	8.5	10.9	10.7	11.0	-	10.7	11.2	11.4
Temperature (° Celsius)	-	-	20.5	20.5	20.6	20.5	20.6	20.7	21.1	-	21.0	21.6	20.9
pH (Standard Units)	-	6.0/8.5	7.6	7.4	7.7	7.4	7.5	7.2	7.6	-	7.6	7.6	7.7
AGP (mg dry wt/L)	53.3 J	-	25.5 J	23.5 J	24.3 J	22.6 AJ	154 J	28.5 J	214 J	369 J	203 J	91.1 J	254 J
BOD-5 Day (mg/L)	2.2	24.3*	0.2 U	0.2 U	0.21 I	0.2 AU	0.72 I	0.2 U	0.21 I	0.22 I	0.2 U	0.69 I	0.41 I
Microbiological Results (number of counts/100ml)													
Fecal Coliforms	-	200*	28 Q	24 Q	69 AQ	38 Q	30 Q	30 Q	40 Q	34 Q	40 Q	18 Q	22 Q
Total Coliforms	-	2400**	550 Q	600 Q	215 AQ	240 Q	500 Q	440 Q	160 Q	200 Q	520 Q	370 Q	400 Q

- No data.
* Permit Limit.
** Class III Water Quality Standard.
b – Value is calculated based on hardness.
A - Value reported is the mean of two or more determinations.
B – Results based on colony counts outside the acceptable range.
I - Value reported is < the practical quantitation level, and ≥ the minimum detection limit
J - Estimated value.
K – Actual value is known to be less than the value given.
L - Actual value is known to be greater than value given.
Q – Sample held beyond normal holding time.
U – Material analyzed for but not detected; value reported is the minimum detection limit.
NOEC - A no observed effect concentration less than 100% effluent will constitute a violation of this permit

Table 1B. Chemical, physical and biological results from effluent and study sites: January 2002.													
	Effluent	Effluent Limits	Control Sites				Test Sites						
Component			30A	30B	100A	100B	1A	1B	3A	3A Dup	3B	6A	6B
Nutrients (mg/L)													
Ammonia	0.068 A	-	0.030	0.034	0.031	0.031	0.04	0.035	0.036	0.036	0.036 A	0.038	0.027
Un-ionized ammonia	0.0004	<0.02*	0.0004	0.0005	0.0006	0.0006	0.0006	0.0003	0.0005	-	0.0005	0.0006	0.0003
Nitrate and nitrite	89	-	0.54 J	0.54 J	0.53 J	0.54 J	1.8 J	0.96 J	4.4	4.6	2.8 J	7.2 J	7.3
Total Kjeldahl nitrogen	1.5	15*	0.16 I	0.18 I	0.18 I	0.18 I	0.18 I	0.17 I	0.34 J	0.37 JA	0.24 J	0.51 J	0.56 J
Nitrate nitrogen	87 A	-	-	-	-	-	-	-	-	-	-	-	-
Total soluble inorganic nitrogen	89.07	-	0.57	0.57	0.56	0.57	1.84	1.00	4.44	4.64	2.84	7.24	7.33
Ortho-phosphate	13	-	0.32	0.082	0.32	0.33	0.52	0.38	0.85	0.75	0.82	1.1	1.5
Total phosphorus	13 A	-	0.3	0.32	0.31	0.31	0.45	0.37	0.91	0.86 A	0.65	1.2	1.3
Physical, Chemical and Biological Results													
Total suspended solids (mg/L)	-	46.2*	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Turbidity (NTU)	-	-	0.5	0.45	0.5	0.55	0.7	0.6	0.75	0.7	0.85	0.9	0.95
Color (PCU)	-	-	5	5	5	5	5	5	5	5	5	5	5
Conductivity (µmhos/cm)	1740	1275**	309	309	309	309	317	302	357	-	344	374	398
Dissolved oxygen (mg/L)	8.5	5.0	10.0	9.7	9.7	9.8	6.9	7.3	7.3	-	7.0	7.5	7.2
Temperature (°Celsius)	18.9	-	16.7	16.7	16.7	16.7	16.7	16.7	16.8	-	16.8	16.5	16.9
pH (Standard Units)	7.1	6.0/8.5*	7.6	7.6	7.7	7.7	7.6	7.4	7.6	-	7.6	7.6	7.5
Hardness (mg $CaCO_3$)	733.7	-	-	-	-	-	-	-	-	-	-	-	-
AGP (mg dry wt/L)	34.3 J	-	27.7 J	26.3 J	28.3 J	27.9 J	85.2 J	40.4 J	74.4 J	88.9 J	80.2 J	103.0 J	116.0 J
BOD-5 Day (mg/L)	3.6	24.3*	0.24 I	0.33 I	0.37 I	0.38 AI	0.20 U	0.20 U	0.48 I	0.38 I	0.22 I	0.59 I	0.34 I
Microbiological Results (number of counts/100ml)													
Fecal coliforms	4 K	200*	84	98	68 B	68 B	60 B	100	96	40 B	100	68 B	211 A
Total coliforms	220	-	310	350	180	240	290	270	440	280	420	250	340
Toxicity (48 hour static screening bioassay)													
Bioassay- Fish	100% L	NOEC	-	-	-	-	-	-	-	-	-	-	-
Bioassay- Water flea	100% L	NOEC	-	-	-	-	-	-	-	-	-	-	-
Organic Constituents													
None detected	-		-	-	-	-	-	-	-	-	-	-	-
Oil and grease (mg/L)	5.0 U	5.0*	-	-	-	-	-	-	-	-	-	-	-
Metals (µg/L)													
Aluminum	20 U	1500**	-	-	-	-	-	-	-	-	-	-	-
Arsenic	3 U	50**	-	-	-	-	-	-	-	-	-	-	
Cadmium	0.025 U	5.4**b	-	-	-	-	-	-	-	-	-	-	-
Chromium	2 U	1059**b	-	-	-	-	-	-	-	-	-	-	-
Copper	4.2 I	65**b	-	-	-	-	-	-	-	-	-	-	-
Iron_271	35 U	1000*	-	-	-	-	-	-	-	-	-	-	-
Lead	0.3 U	40**b	-	-	-	-	-	-	-	-	-	-	-
Nickel	4.1 I	851**b	-	-	-	-	-	-	-	-	-	-	-
Selenium	4.0 U	5.0**	-	-	-	-	-	-	-	-	-	-	-
Silver	0.1 U	0.07**	-	-	-	-	-	-	-	-	-	-	-
Zinc	4.5 U	574**b	-	-	-	-	-	-	-	-	-	-	-

Note: Abbreviations and comment codes listed below Table 1A.

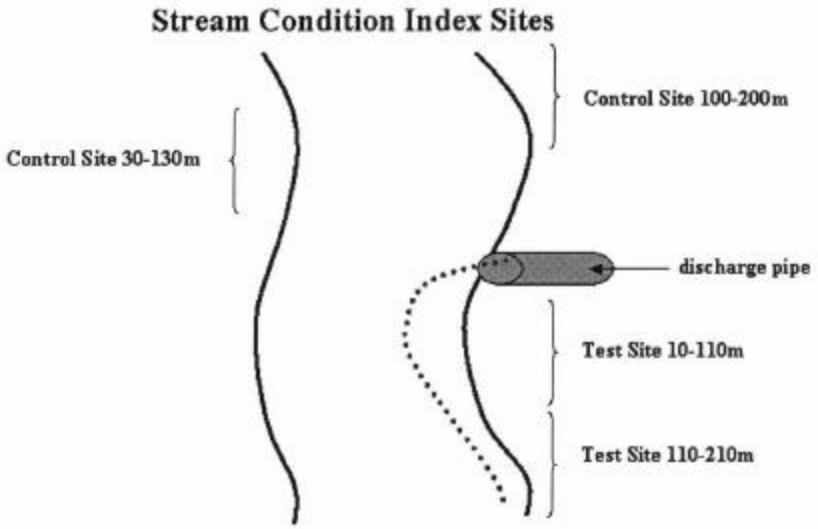
Table 2. Dye concentrations and sampling point locations					
Sampling point code	Distance from outfall (m)	Flourometer reading (ppb)		Latitude	Longitude
		December	January		
Effluent	0	51.0	63	30° 21'56.1"	83°11'29.8"
Test 6A	-8m	6.1	7.4	30° 21'56.0"	83°11'30.0"
Test 6B	-8m	5.8	4.8	30° 21'55.8"	83°11'30.1"
Test 3A	-55m	2.8	1.8	30° 21'54.2"	83°11'29.7"
Test 3B	-55m	3.1	2.8	30° 21'54.0"	83°11'29.9"
Test 1A	-150m	0.9	0.2	30° 21'51.3"	83°11'30.1"
Test 1B	-150m	1.2	0.1	30° 21'51.4"	83°11'29.8"
Control 30A	+30m	-	-	30° 21'57.3"	83°11'30.4"
Control 30B	+30m	-	-	30° 21'57.3"	83°11'30.6"
Control 100A	+100m	-	-	30° 22'0.2"	83°11'30.9"
Control 100B	+100m	-	-	30° 22'0.1"	83°11'31.0"
Background reading subtracted from observed dye readings.					

Table 3. Least squares means and 95% confidence intervals (CI): AGP: mg dry weight/L			
Location	Mean AGP	Lower 95% CI	Upper 95% CI
Control 100A,B	25.7 a	6.7	57.0
Control 30A,B	25.7 a	6.7	57.0
Test 6A,B	134.6 b c	83.2	198.2
Test 3A,B	134.9 b c	83.5	198.6
Test 1A,B	69.5 a c	34.3	116.9
Data are back calculated from square root transformed means. Means followed by the same letter do not differ significantly from each other. See text for further explanation.			

Table 4. Relationship between grazer abundance and chlorophyll *a* levels on periphytometers: Fisher's Exact Test, p=0.0083		
	Chlorophyll *a* ≤50 mg/m^2	Chlorophyll *a* >50 mg/m^2
≤25 grazers on rack	0	3
>25 grazers on rack	7	0

Table 5. Stream Condition Index (SCI) results					
Location		Control 100m	Control 30m	Test 10m	Test 110m
Number originally sampled		95	117	464	279
Number resampled		NA	100	100	100
Mean SCI score ± 95% confidence interval		29	26.8 ± 0.1	16.5 ± 0.4	20.0 ± 0.5
Range		NA	23-27	13-21	15-27
Mean SCI result		Excellent	Excellent	Poor	Poor
Range of SCI results	Excellent	1	92	0	1
	Good	0	8	1	45
	Poor	0	0	92	54
	Very Poor	0	0	7	0
Data for Control 30m, Test 10m and Test 110m were electronically subsampled to a sample size of 100. Values given are derived from 100 independent subsamplings of raw data. NA = not applicable. Northeast district, Winter Index Period.					

Figure 1. Gold Kist Poultry



Sampling points: Water, Hester-Dendy blocks and periphytometers

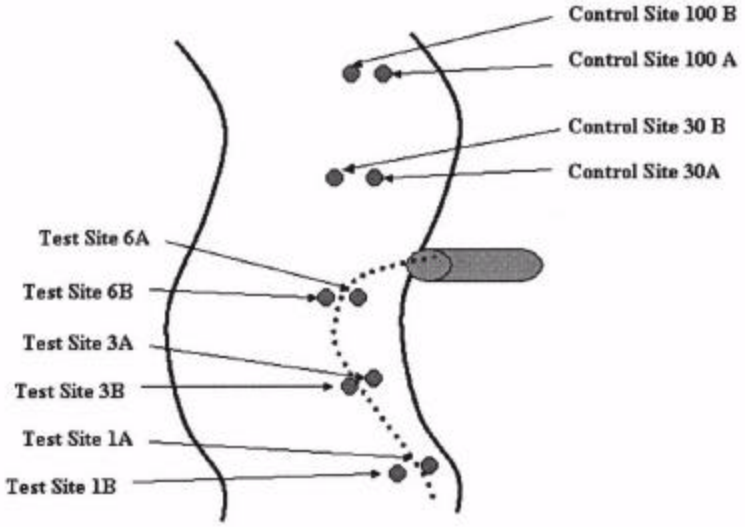


Figure 1. Schematic map of sampling locations for Gold Kist Outfall 001, Suwannee River. Coordinates given in Table 2 and location map in Appendix 1. Note Stream Condition Index sites are 100m lengths of shore.

Figure 2A.

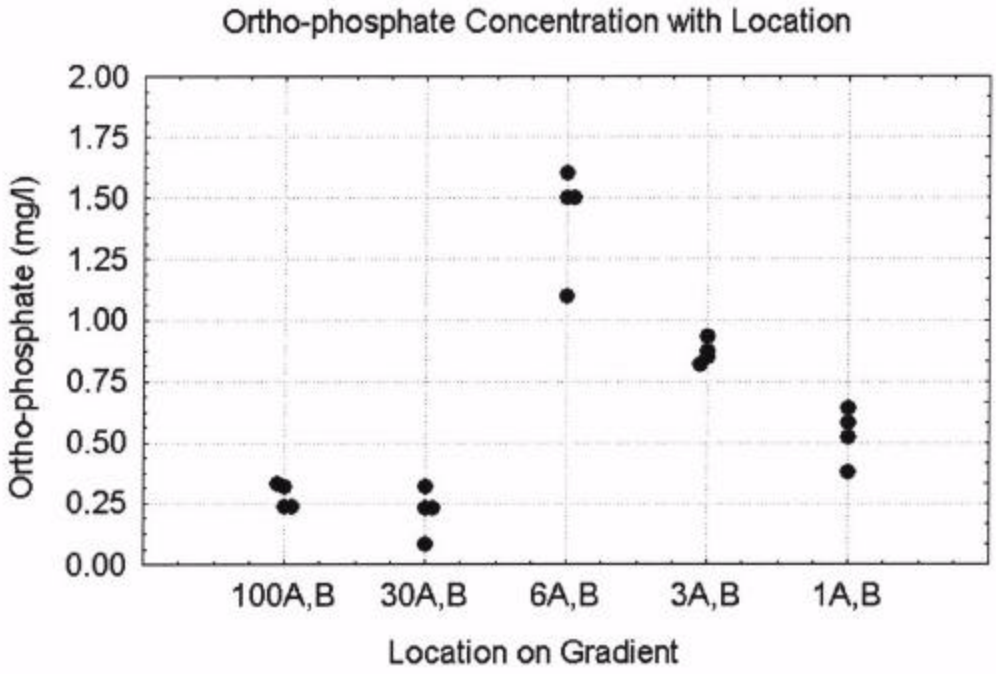


Figure 2B.

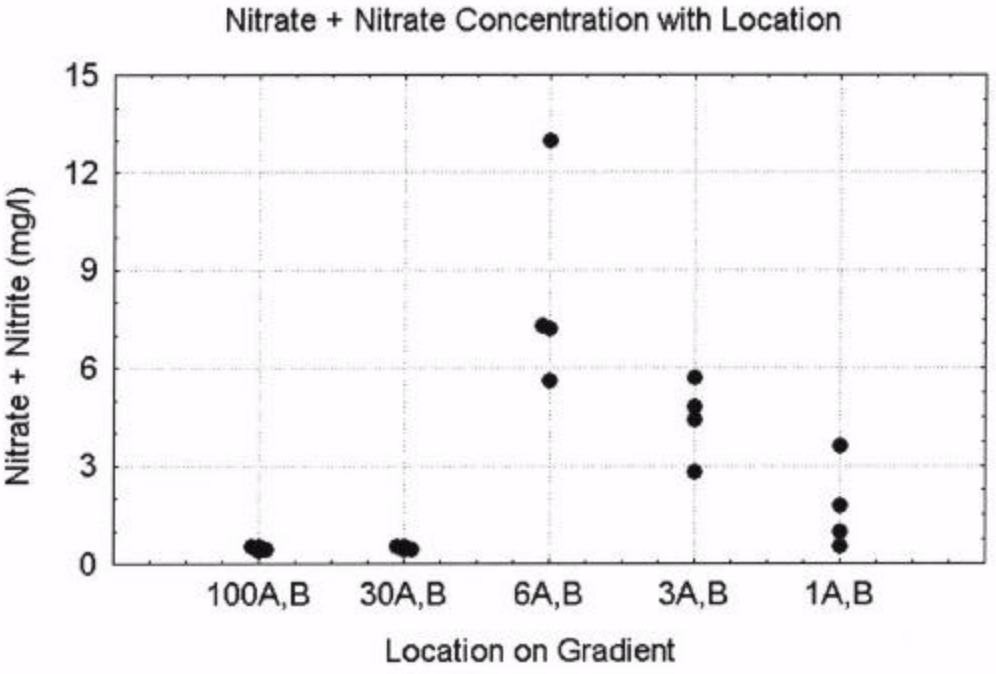


Figure 2. Nutrient concentrations up- and downstream of the Gold Kist outfall. A. Orthophosphate B. Nitrate + Nitrite. Outfall is located ~8 m upstream of Sampling Points 6A,6B. Data from December and January combined. Effluent concentrations of orthophosphate were 13.0 mg/L on both dates; nitrate + nitrite concentrations ranged from 89.0-99.0 mg/L.

Figure 3A.

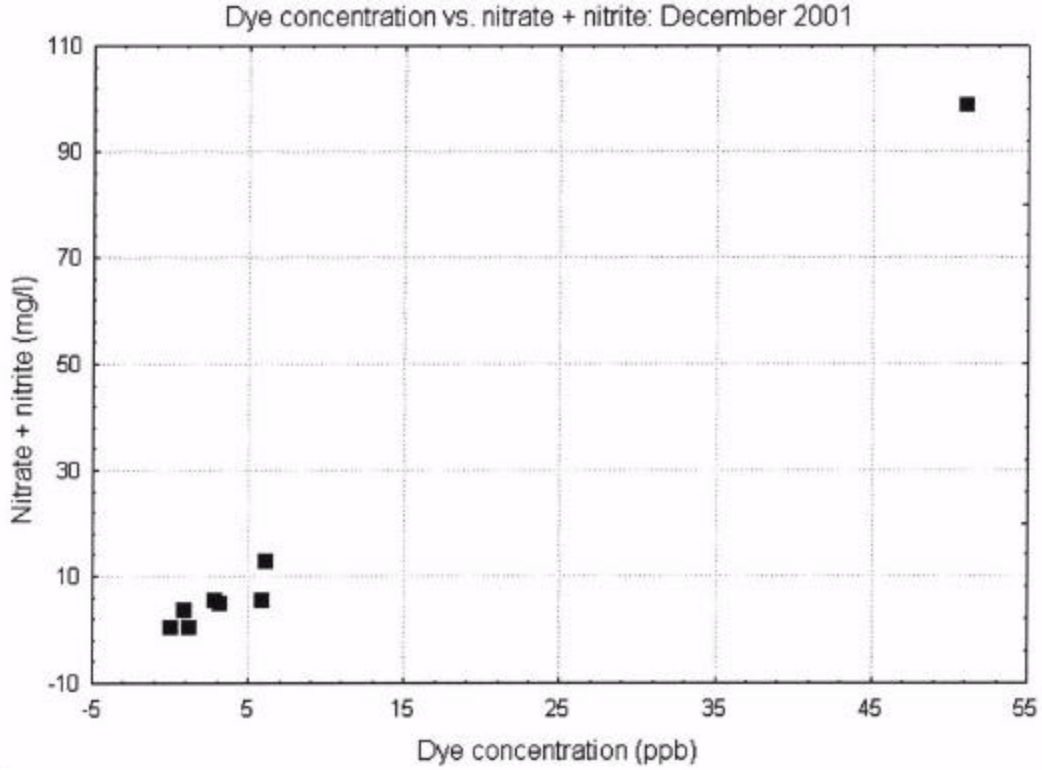


Figure 3B.

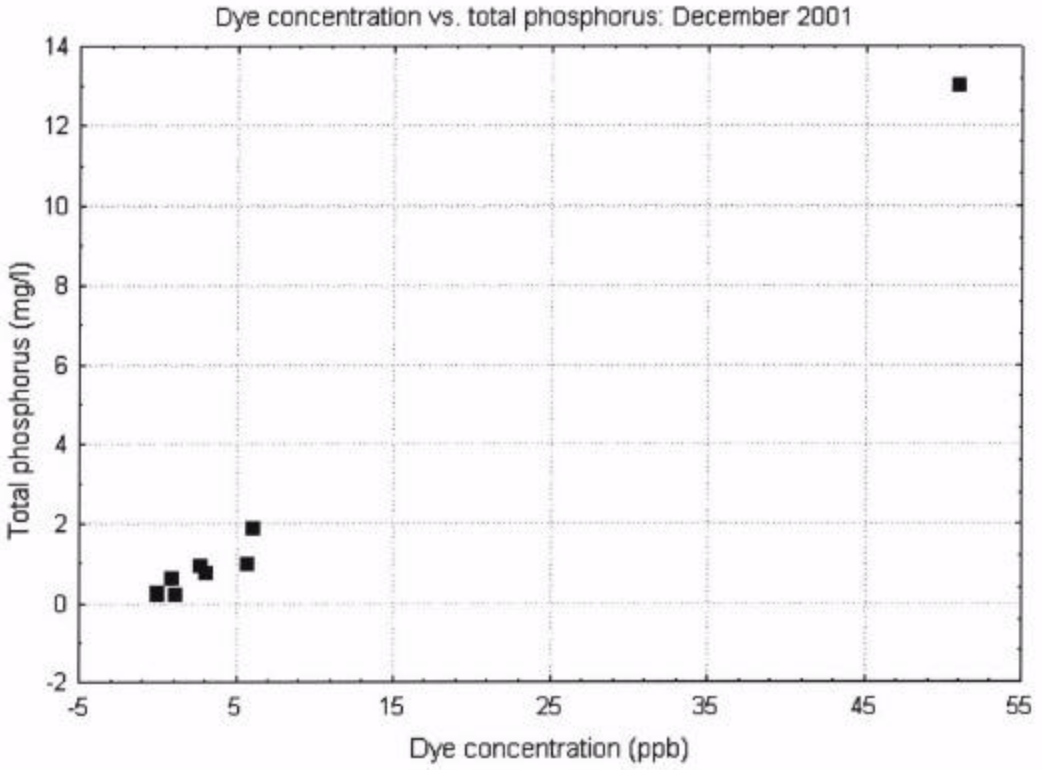


Figure 3, continued, 3C.

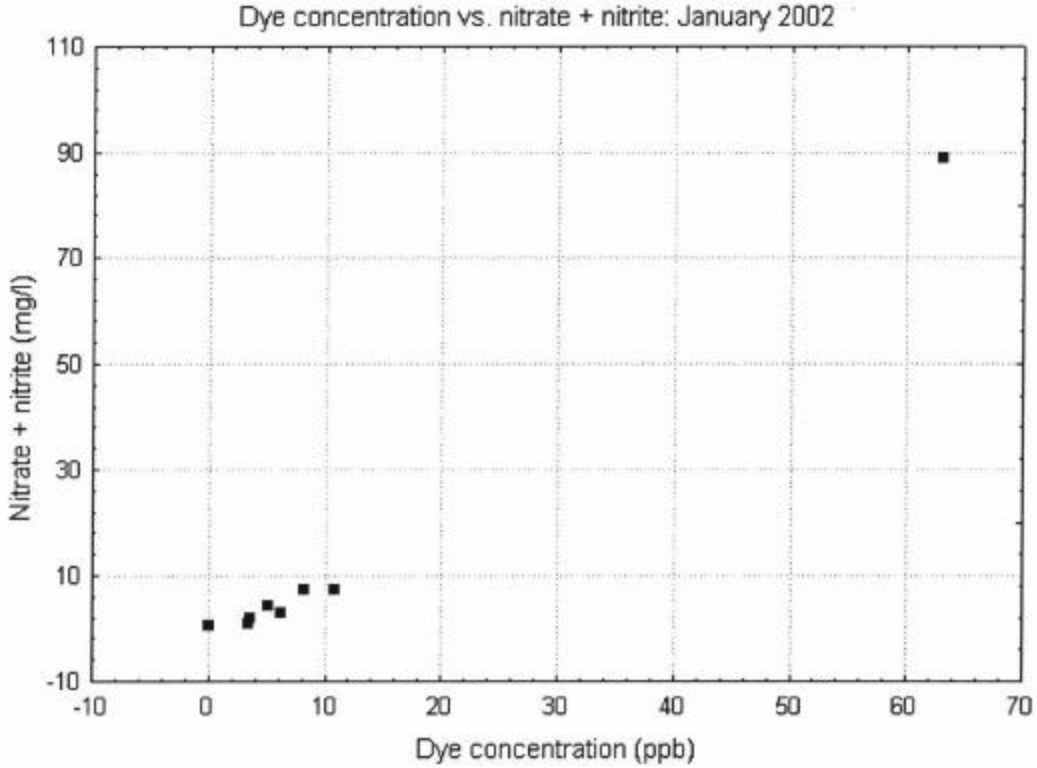


Figure 3D.

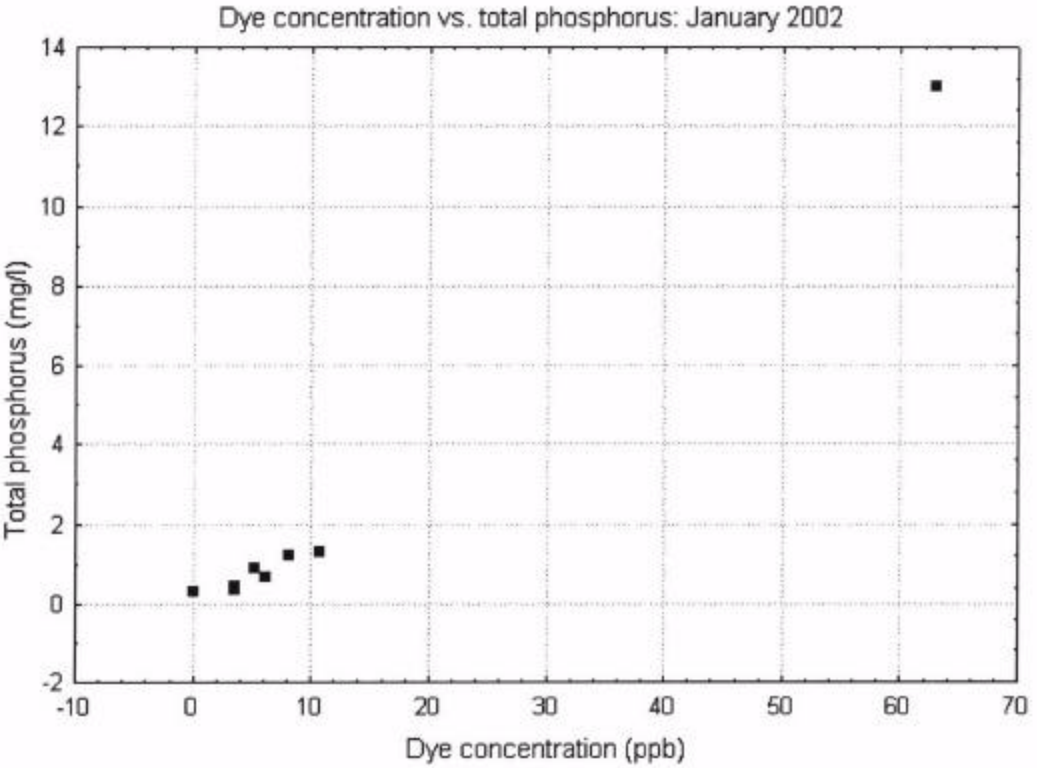


Figure 3. Dye dilution vs. nutrient concentrations. A. December 2001, nitrate + nitrite, B. December 2001, total phosphorus, C. January 2002, nitrate + nitrite, D. January 2002, total phosphorus.

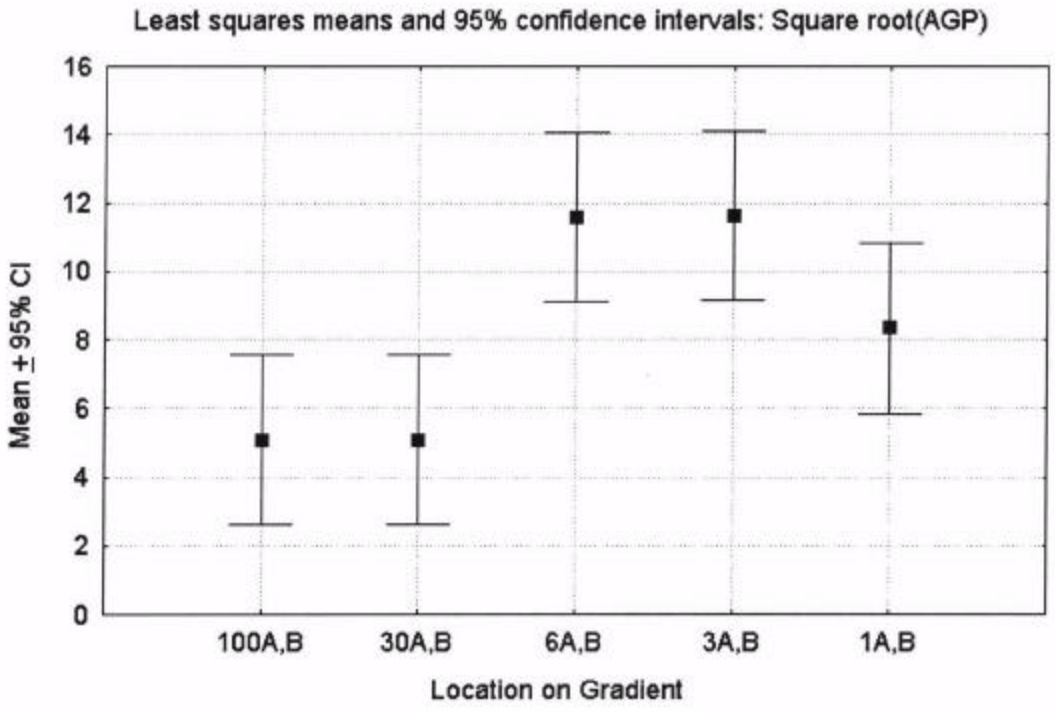


Figure 4. Least squares means and 95% confidence intervals for square root-transformed algal growth potential (AGP). Back-transformed values are given in Table 3.

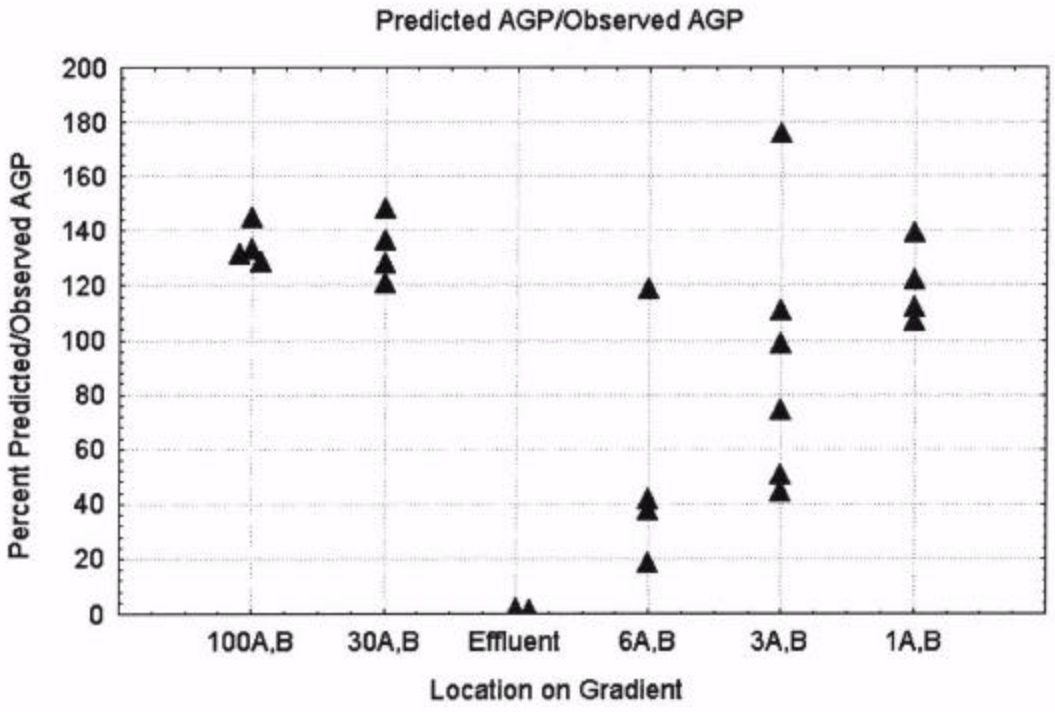


Figure 5. Predicted vs. observed algal growth potential, under the assumption that total suspended inorganic nitrogen is the limiting nutrient. If AGP production values are 100%±20%, they are within the expected range (Miller et al. 1978). Values <80% of the predicted range indicate lower AGP production than expected, while values >120% indicate higher AGP production than expected. The effluent, and sampling points immediately downstream of the Gold Kist outfall have lower AGP production that expected; upstream of the outfall, AGP production is slightly higher than expected. Data from December 2001 and January 2002 combined.

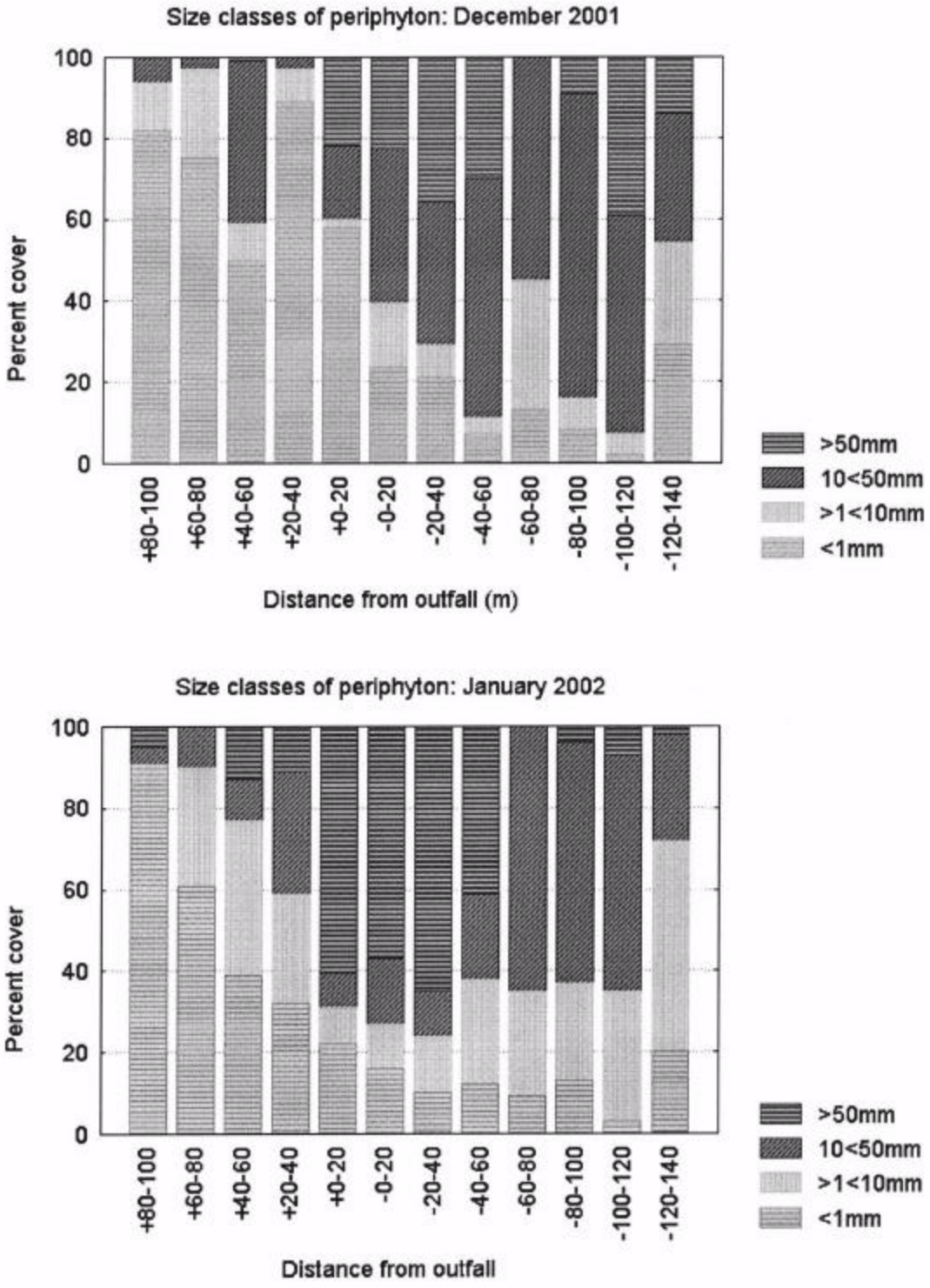


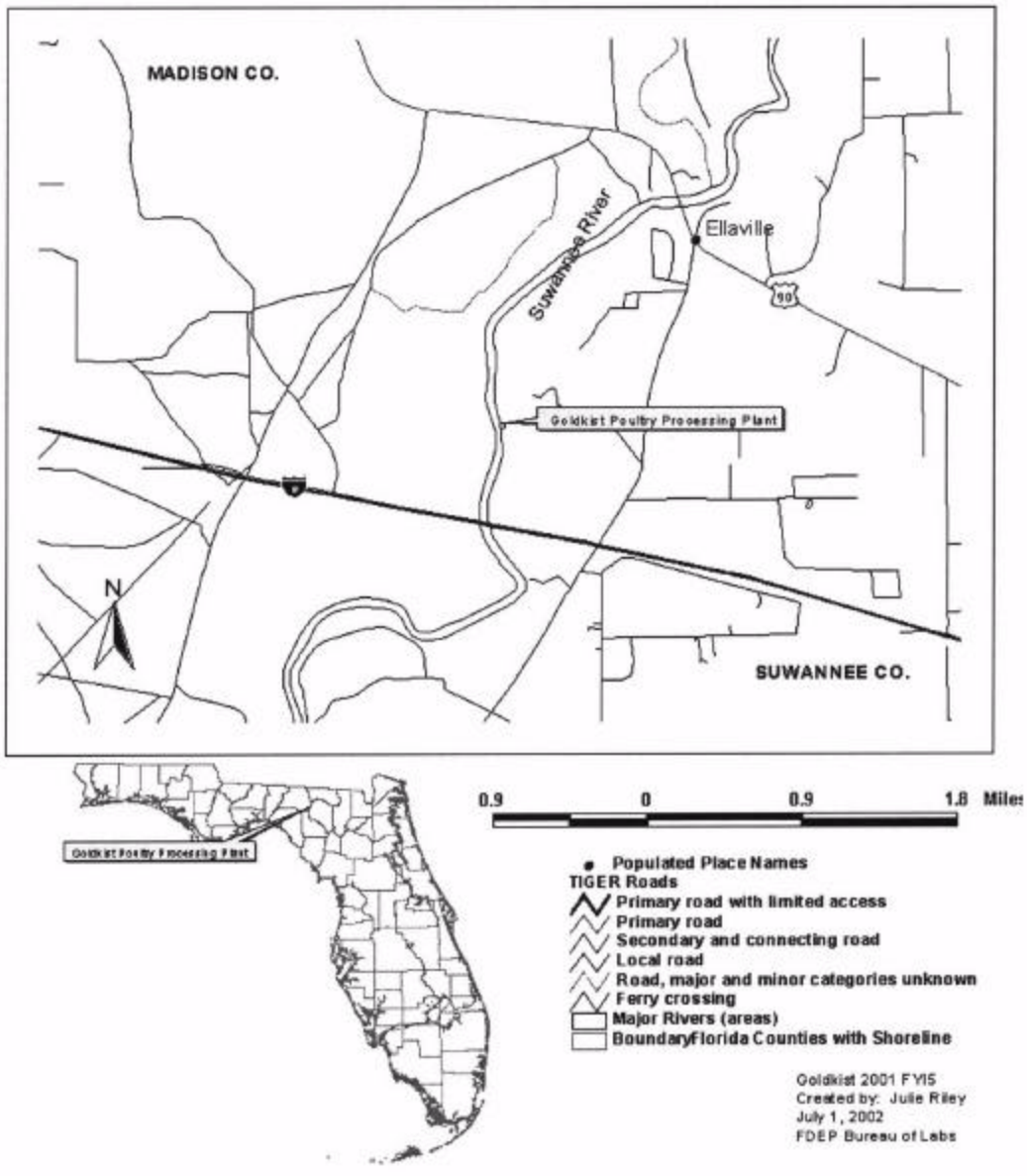
Figure 6. Size classes of periphyton with distance from the outfall. A. December 2001, B. January 2002. Positive distances (meters) are upstream of the outfall, negative distances are downstream of the outfall. Note the extensive coverage of algae >10mm long downstream of the Gold Kist outfall.

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    - Appendix Table 3.2. Chemical analyses, December 2001 and January 2002
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    - Appendix Table 4.1. Principal component weightings and percent of variance explained, December 2001
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    - Appendix Table 4.3. Correlations between dye concentration and nutrient concentration
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8. Qualitative Stream Condition Index Data
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9. Quantitative macroinvertebrate data: Hester-Dendy multi-plate samplers
    - Appendix Table 9.1. Macroinvertebrate taxa list: Hester-Dendy multi-plate samplers

Appendix 1 Map of Gold Kist Poultry Processing Plant, Suwannee County

Goldkist Poultry Processing Plant



Appendix 2. Florida Department of Environmental Protection Facility Summary

State of Florida
Department of Environmental Protection
Facility Summary

Facility Name: Gold Kist Inc.		**Prepared By:** W. Jeremy RiCharde **Date:** 07/08/02
Location: Live Oak	**County:** Suwannee	**District:** Northeast
Federal Permit No.: FL0001465 **Expiration Date:** October 26, 2002	**State GMS #** NA **State Expiration Date:** N/A	**Facility Type:** Industrial
Function of Facility: poultry processing		
Description of treatment process: The facility produces wastewater from poultry processing, rendering of byproducts, hatchery, sanitary wastewater, equipment washdown, and stormwater. The industrial wastewater treatment facility consists of primary and secondary screening, flow equalization, chemical coagulation/floculation, dissolved air flotation, anaerobic digestion, aerobic/anoxic digestion, secondary clarifier, polishing pond, sand filtration, pH adjustment, and chlorination/dechlorination. Sludge from the activated sludge process is aerobically digested and land applied to a sprayfield.		
Receiving Waters: Suwannee River	**Classification:** Class III –Fresh Water	
Design Flow: 1.7 MGD	**Mean Flow:** 1.5 MGD	**Flow during survey:** 1.546 MGD
Discharge is: *Continuous X* Intermittent Seasonal Rainfall Dependent Other		
Facility Mixing Zone Details: none		
List effluent limits:		

Parameter	Limit	Describe special permit conditions and permit modifications:
Flow (MGD)	Monthly Average Report Daily Maximum Report	An anti-degradation analysis pursuant to FAC 62-302.300 and 62-4.244 shall be submitted upon exceedance of a monthly average flow of 1.5 MGD or a daily maximum flow of 1.7 MGD.
BOD_5 (mg/L)	Daily Maximum Report	Influent Monthly 24 Hr. composite
BOD_5 (mg/l)	Annual Average 15 Monthly Average 18 Daily Maximum 24.3	Effluent Weekly 24-Hr. composite
BOD_5 (lbs/day)	Monthly Average 156 Daily Maximum 211	Effluent weekly calculated
Total Suspended Solids (mg/l)	Report Daily Maximum	Influent Monthly 24-Hr. composite
Total Suspended Solids (mg/l)	Annual Average 20.0	Effluent weekly 24-Hr. Composite

	Monthly Average 25.5 Daily Maximum 46.2	
Total Suspended Solids (lbs/day)	Monthly Average 221 Daily Maximum 401	Effluent Weekly Calculated
TKN (mg/L)	Monthly Average 10 Daily Maximum 15	Effluent Weekly 24-Hr. Composite
TKN (lbs/day)	Monthly Average 87 Daily Maximum 130	Effluent Weekly Calculated
TKN (mg/L)	Report Daily Maximum	Monthly Grab SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Total Ammonia as N (mg/L)	Report Daily Maximum	Effluent Weekly Grab
Total Ammonia as N (mg/L)	Report Daily Maximum	Monthly Grab SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Temperature Degrees C	Report Daily Maximum	Effluent Weekly Grab
Temperature Degrees C	Report Daily Maximum	Monthly Grab SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Unionized Ammonia as NH3 (mg/L)	Daily Maximum 0.02	Effluent Weekly Calculated
Unionized Ammonia as NH3 (mg/L)	Report Daily Maximum	Monthly Calculated SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Dissolved Oxygen (mg/L)	Report Daily Minimum	Monthly Grab SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Nitrate (NO3) as N (mg/L)	Report Daily Maximum	Monthly Grab SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Oil & Grease (mg/L)	Monthly Average 5	Effluent Weekly Grab

	Daily Maximum 5	
Total Residual Chlorine (mg/L)	Daily Maximum 0.01	Effluent Weekly Grab
Fecal Coliform (#/100ml)	Daily Maximum 200	Effluent Weekly Grab
pH (S.U.)	Daily Maximum 8.5	Effluent Weekly Grab
	Daily Minumum 6.0	
pH (S.U.)	Report	Monthly Grab SWU-1 (0.1 mile upstream of D-001) and SWD-1 (0.2 mile downstream of D-001)
Acute Whole Effluent Toxicity	LC50>100%	Quarterly Grab

Description of permitted outfall: The effluent discharges through outfall D-001 to the Suwannee River, a Class III surface water and an Outstanding Florida Water (OFW).

List permit violations (DMR data) and plant upsets that occurred at the plant within the past year:
The November 2001 DMR reports a pH of 5.66, below the minimum of 6.0.
The August 2001 DMR reported a fecal coliform level of 900 #/100 mL, above their limit of 200.
The facility triggered the anti-degradation clause in their permit, with a daily maximum flow above 1.7 MGD and a monthly average flow above 1.5 MGD.

Abnormal Events: The file indicates that the August 2001 fecal coliform exceedance was believed to be a sampling and/or laboratory anomaly.

Toxicity: The facility has passed all acute toxicity tests within the past year.

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
A Fifth Year inspection, conducted in December 1999 and Jan 2000, indicated elevated effluent nutrient loading and moderate water quality degradation for Hester-Dendy and periphyton richness.
A warning letter was issued on May 1, 2001 to address the nutrient enrichment. The department is working with Gold Kist to modify the permit to include a reduction in total nitrogen with permit limitations.

Discuss MOR trends to prior data; is the trend improving or declining:

Additional Information: The anaerobic lagoon was constructed in 1998 for more efficient conversion of organic nitrogen to ammonia, BOD removal, and flow equalization. Since its addition, nitrate levels in the effluent have increased.

Appendix 3. Additional Chemical, Toxicological and Microbiological Results

Table 3.1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Gold Kist Poultry Division, U.S. Highway 90 West, Live Oak, Suwannee County, Florida, NPDES# FL0001465, performed from 16 to 18 January 2002.

Facility:	**GoldKist Poultry Division**		**NPDES #**	**FL0001465**	Facility Type:	**Poultry Processing Plant**	**Analysts:** Della Parker-Hanson
Location:	U.S. Highway 90 West, Live Oak		Contact/District:	Jim Maher/Northeast			Joshua Ayres
County:	Suwannee		Test type:	static acute screen			Gary Hardie
Sample Collection Date:	1/15/2002	Time: 1102	# tests:	2	Receiving Water:	Suwannee River	Marshall Faircloth
Test Beginning Date:	1/16/2002	Time: 1315	Chlorination Type:	non-chlorinated			Eva Pastora
Test Ending Date:	1/18/2002	Time: 1400				**Page 1 of 1**	**Reviewer:** David Whiting

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.2	-	8.1	24.6	-	24.3	7.9	-	7.1	150	170
Control B	0/20	5	5	5	-	-	8.1	-	-	24.3	-	-	7.0	-	175
Control C	0/20	5	5	5	-	-	8.1	-	-	24.3	-	-	6.9	-	185
Control D	0/20	5	5	5	-	-	8.2	-	-	24.2	-	-	6.8	-	185
100% A	20/0	5	5	5	7.5	-	8.8	24.8	-	24.2	8.0	-	7.0	1525	1590
100% B	20/0	5	5	5	-	-	8.8	-	-	24.4	-	-	6.9	-	1650
100% C	20/0	5	5	5	-	-	8.8	-	-	24.3	-	-	6.9	-	1720
100% D	20/0	5	5	5	-	-	8.8	-	-	24.2	-	-	6.8	-	1740

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 22.0-23.5 °C.
Incubator #2 temperature range for the test period was 23.0-26.0°C.

Organism: ***Cyprinella leedsi*** Life stage: 12 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	7.8	8.5	8.4	24.7	23.3	24.1	7.1	7.3	6.7	320	370
Control B	0/500	5	5	5	8.0	8.6	8.4	25.9	23.1	24.2	7.3	7.2	6.8	285	330
Control C	0/500	5	5	5	8.0	8.6	8.4	24.9	23.1	24.2	7.3	7.3	6.6	280	310
Cotnrol D	0/500	5	5	5	8.0	8.6	8.4	25.9	24.1	24.4	7.3	7.3	6.5	280	300
100% A	500/0	5	5	5	7.5	8.4	8.5	25.5	23.4	24.4	7.8	7.3	6.7	1625	1500
100% B	500/0	5	5	5	7.5	8.4	8.5	25.4	23.3	24.5	7.9	7.3	6.6	1660	1620
100 % C	500/0	5	5	5	7.5	8.4	8.5	25.4	23.3	24.5	8.1	7.3	6.6	1665	1650
100% D	500/0	5	5	5	7.5	8.4	8.5	25.4	23.4	24.3	8.1	7.2	6.5	1675	1660

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 22.0-23.5°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

LIMS	
Job number:	TLH-2002-01-16-41
sample number:	571626

Data Transcription Verification	
date:	6/25/2002
by:	Joshua Ayres

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	0.05	Hach

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

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	138	130
Control water (water flea):	73	81
100% Sample:	348	740

Appendix Table 3.2 A. Gold Kist Poultry Processing, December 2001 Chemistry Analyses

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/18/01	CONTROL 100A	Nutrients-Liquid	Ammonia-N	0.023	mg N/L		0.01	0.02
12/18/01	CONTROL 100A	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	CONTROL 100A	Nutrients-Liquid	NO2NO3-N	0.42	mg/L	J	0.004	0.01
12/18/01	CONTROL 100A	Nutrients-Liquid	N_KJEL_TOT	0.13	mg N/L	I	0.06	0.2
12/18/01	CONTROL 100A	Nutrients-Liquid	O-Phosphate-P	0.24	mg P/L		0.008	0.02
12/18/01	CONTROL 100A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	CONTROL 100A	Nutrients-Liquid	Total-P	0.24	mg P/L		0.015	0.04
12/18/01	CONTROL 100A	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
12/18/01	CONTROL 100B	Nutrients-Liquid	Ammonia-N	0.022	mg N/L		0.01	0.02
12/18/01	CONTROL 100B	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	CONTROL 100B	Nutrients-Liquid	NO2NO3-N	0.43	mg N/L	J	0.004	0.01
12/18/01	CONTROL 100B	Nutrients-Liquid	N_KJEL_TOT	0.11	mg N/L	I	0.06	0.2
12/18/01	CONTROL 100B	Nutrients-Liquid	O-Phosphate-P	0.24	mg P/L		0.008	0.02
12/18/01	CONTROL 100B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	CONTROL 100B	Nutrients-Liquid	Total-P	0.23	mg P/L		0.015	0.04
12/18/01	CONTROL 100B	Nutrients-Liquid	Turbidity	0.4	NTU		0.05	0.05
12/18/01	CONTROL 30A	Nutrients-Liquid	Ammonia-N	0.024	mg N/L		0.01	0.02
12/18/01	CONTROL 30A	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	CONTROL 30A	Nutrients-Liquid	NO2NO3-N	0.43	mg N/L	J	0.004	0.01
12/18/01	CONTROL 30A	Nutrients-Liquid	N_KJEL_TOT	0.14	mg N/L	I	0.06	0.2
12/18/01	CONTROL 30A	Nutrients-Liquid	O-Phosphate-P	0.23	mg P/L		0.008	0.02
12/18/01	CONTROL 30A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	CONTROL 30A	Nutrients-Liquid	Total-P	0.22	mg P/L	A	0.015	0.04
12/18/01	CONTROL 30A	Nutrients-Liquid	Turbidity	0.5	NTU		0.05	0.05
12/18/01	CONTROL 30B	Nutrients-Liquid	Ammonia-N	0.023	mg N/L		0.01	0.02
12/18/01	CONTROL 30B	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	CONTROL 30B	Nutrients-Liquid	NO2NO3-N	0.43	mg N/L	J	0.004	0.01
12/18/01	CONTROL 30B	Nutrients-Liquid	N_KJEL_TOT	0.14	mg N/L	I	0.06	0.2
12/18/01	CONTROL 30B	Nutrients-Liquid	O-Phosphate-P	0.23	mg P/L		0.008	0.02
12/18/01	CONTROL 30B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	CONTROL 30B	Nutrients-Liquid	Total-P	0.22	mg P/L		0.015	0.04
12/18/01	CONTROL 30B	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
12/18/01	GOLDKIST EFFLUENT	Nutrients-Liquid	Ammonia-N	0.048	mg N/L	A	0.01	0.02
12/18/01	GOLDKIST EFFLUENT	Nutrients-Liquid	NO2NO3-N	99	mg N/L	J	0.8	2
12/18/01	GOLDKIST EFFLUENT	Nutrients-Liquid	N_KJEL_TOT	1.8	mg N/L		0.06	0.2
12/18/01	GOLDKIST EFFLUENT	Nutrients-Liquid	Nitrate-N	96		Q	2	4
12/18/01	GOLDKIST EFFLUENT	Nutrients-Liquid	O-Phosphate-P	13	mg P/L		0.24	0.6
12/18/01	GOLDKIST EFFLUENT	Nutrients-Liquid	Total-P	13	mg P/L		0.3	0.8
12/18/01	TEST 1A	Nutrients-Liquid	Ammonia-N	0.023	mg N/L		0.01	0.02
12/18/01	TEST 1A	Nutrients-Liquid	Color	15	PCU		5	5
12/18/01	TEST 1A	Nutrients-Liquid	NO2NO3-N	3.6	mg N/L	J	0.04	0.1
12/18/01	TEST 1A	Nutrients-Liquid	N_KJEL_TOT	0.24	mg N/L	A	0.06	0.2
12/18/01	TEST 1A	Nutrients-Liquid	O-Phosphate-P	0.64	mg P/L		0.016	0.04
12/18/01	TEST 1A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	TEST 1A	Nutrients-Liquid	Total-P	0.63	mg P/L	A	0.015	0.04
12/18/01	TEST 1A	Nutrients-Liquid	Turbidity	0.55	NTU		0.05	0.05
12/18/01	TEST 1B	Nutrients-Liquid	Ammonia-N	0.02	mg N/L	I	0.01	0.02
12/18/01	TEST 1B	Nutrients-Liquid	Color	15	PCU		5	5
12/18/01	TEST 1B	Nutrients-Liquid	NO2NO3-N	0.52	mg/L	J	0.004	0.01
12/18/01	TEST 1B	Nutrients-Liquid	N_KJEL_TOT	0.14	mg N/L	I	0.06	0.2
12/18/01	TEST 1B	Nutrients-Liquid	O-Phosphate-P	0.58	mg P/L		0.016	0.04
12/18/01	TEST 1B	Nutrients-Liquid	TSS	4	mg/L	U	4	16

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/18/01	TEST 1B	Nutrients-Liquid	Total-P	0.23	mg P/L		0.015	0.04
12/18/01	TEST 1B	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
12/18/01	TEST 3A	Nutrients-Liquid	Ammonia-N	0.024	mg N/L		0.01	0.02
12/18/01	TEST 3A	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	TEST 3A	Nutrients-Liquid	NO2NO3-N	5.7	mg N/L	J	0.04	0.1
12/18/01	TEST 3A	Nutrients-Liquid	N_KJEL_TOT	0.43	mg N/L		0.06	0.2
12/18/01	TEST 3A	Nutrients-Liquid	O-Phosphate-P	0.87	mg P/L		0.02	0.05
12/18/01	TEST 3A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	TEST 3A	Nutrients-Liquid	Total-P	0.93	mg P/L		0.015	0.04
12/18/01	TEST 3A	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	Ammonia-N	0.024	mg N/L		0.01	0.02
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	NO2NO3-N	5.5	mg N/L	J	0.4	1
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	N_KJEL_TOT	0.43	mg N/L		0.06	0.2
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	O-Phosphate-P	1	mg P/L		0.08	0.2
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	Total-P	0.95	mg P/L		0.015	0.04
12/18/01	TEST 3A DUPLICATE	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
12/18/01	TEST 3B	Nutrients-Liquid	Ammonia-N	0.024	mg N/L		0.01	0.02
12/18/01	TEST 3B	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	TEST 3B	Nutrients-Liquid	NO2NO3-N	4.8	mg N/L	J	0.04	0.1
12/18/01	TEST 3B	Nutrients-Liquid	N_KJEL_TOT	0.28	mg N/L		0.06	0.2
12/18/01	TEST 3B	Nutrients-Liquid	O-Phosphate-P	0.93	mg P/L		0.02	0.05
12/18/01	TEST 3B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	TEST 3B	Nutrients-Liquid	Total-P	0.79	mg P/L		0.015	0.04
12/18/01	TEST 3B	Nutrients-Liquid	Turbidity	0.65	NTU		0.05	0.05
12/18/01	TEST 6A	Nutrients-Liquid	Ammonia-N	0.023	mg N/L		0.01	0.02
12/18/01	TEST 6A	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	TEST 6A	Nutrients-Liquid	NO2NO3-N	13	mg N/L	J	0.4	1
12/18/01	TEST 6A	Nutrients-Liquid	N_KJEL_TOT	0.62	mg N/L		0.06	0.2
12/18/01	TEST 6A	Nutrients-Liquid	O-Phosphate-P	1.6	mg P/L		0.08	0.2
12/18/01	TEST 6A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	TEST 6A	Nutrients-Liquid	Total-P	1.9	mg P/L		0.075	0.2
12/18/01	TEST 6A	Nutrients-Liquid	Turbidity	0.7	NTU		0.05	0.05
12/18/01	TEST 6B	Nutrients-Liquid	Ammonia-N	0.024	mg N/L	A	0.01	0.02
12/18/01	TEST 6B	Nutrients-Liquid	Color	10	PCU		5	5
12/18/01	TEST 6B	Nutrients-Liquid	NO2NO3-N	5.6	mg N/L	J	0.4	1
12/18/01	TEST 6B	Nutrients-Liquid	N_KJEL_TOT	0.45	mg N/L		0.06	0.2
12/18/01	TEST 6B	Nutrients-Liquid	O-Phosphate-P	1.5	mg P/L		0.08	0.2
12/18/01	TEST 6B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
12/18/01	TEST 6B	Nutrients-Liquid	Total-P	0.99	mg P/L		0.03	0.08
12/18/01	TEST 6B	Nutrients-Liquid	Turbidity	0.65	NTU		0.05	0.05

Appendix Table 3.2 B. Gold Kist Poultry Processing, January 2002 Chemistry Analyses

Date	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
01/15/02	CONTROL 100 A	Nutrients-Liquid	Ammonia-N	0.031	mg N/L		0.01	0.02
01/15/02	CONTROL 100 A	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	CONTROL 100 A	Nutrients-Liquid	NO2NO3-N	0.53	mg N/L	J	0.004	0.01
01/15/02	CONTROL 100 A	Nutrients-Liquid	N_KJEL_TOT	0.18	mg N/L	I	0.06	0.2
01/15/02	CONTROL 100 A	Nutrients-Liquid	O-Phosphate-P	0.32	mg P/L		0.016	0.04
01/15/02	CONTROL 100 A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	CONTROL 100 A	Nutrients-Liquid	Total-P	0.31	mg P/L		0.015	0.04
01/15/02	CONTROL 100 A	Nutrients-Liquid	Turbidity	0.5	NTU		0.05	0.05
01/15/02	CONTROL 100 B	Nutrients-Liquid	Ammonia-N	0.031	mg N/L		0.01	0.02
01/15/02	CONTROL 100 B	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	CONTROL 100 B	Nutrients-Liquid	NO2NO3-N	0.54	mg N/L	J	0.004	0.01
01/15/02	CONTROL 100 B	Nutrients-Liquid	N_KJEL_TOT	0.18	mg N/L	I	0.06	0.2
01/15/02	CONTROL 100 B	Nutrients-Liquid	O-Phosphate-P	0.33	mg P/L		0.016	0.04
01/15/02	CONTROL 100 B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	CONTROL 100 B	Nutrients-Liquid	Total-P	0.31	mg P/L		0.015	0.04
01/15/02	CONTROL 100 B	Nutrients-Liquid	Turbidity	0.55	NTU		0.05	0.05
01/15/02	CONTROL 30 A	Nutrients-Liquid	Ammonia-N	0.03	mg N/L		0.01	0.02
01/15/02	CONTROL 30 A	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	CONTROL 30 A	Nutrients-Liquid	NO2NO3-N	0.54	mg N/L	J	0.004	0.01
01/15/02	CONTROL 30 A	Nutrients-Liquid	N_KJEL_TOT	0.16	mg N/L	I	0.06	0.2
01/15/02	CONTROL 30 A	Nutrients-Liquid	O-Phosphate-P	0.32	mg P/L		0.016	0.04
01/15/02	CONTROL 30 A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	CONTROL 30 A	Nutrients-Liquid	Total-P	0.3	mg P/L		0.015	0.04
01/15/02	CONTROL 30 A	Nutrients-Liquid	Turbidity	0.5	NTU		0.05	0.05
01/15/02	CONTROL 30 B	Nutrients-Liquid	Ammonia-N	0.034	mg N/L		0.01	0.02
01/15/02	CONTROL 30 B	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	CONTROL 30 B	Nutrients-Liquid	NO2NO3-N	0.54	mg N/L	J	0.004	0.01
01/15/02	CONTROL 30 B	Nutrients-Liquid	N_KJEL_TOT	0.18	mg N/L	I	0.06	0.2
01/15/02	CONTROL 30 B	Nutrients-Liquid	O-Phosphate-P	0.082	mg P/L		0.004	0.01
01/15/02	CONTROL 30 B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	CONTROL 30 B	Nutrients-Liquid	Total-P	0.32	mg P/L		0.015	0.04
01/15/02	CONTROL 30 B	Nutrients-Liquid	Turbidity	0.45	NTU		0.05	0.05
01/15/02	EFFLUENT	BNA-Water	1,2,4-Trichlorobenzene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	1,2-Dichlorobenzene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	1,3-Dichlorobenzene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	1,4-Dichlorobenzene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2,4,6-Trichlorophenol	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2,4-Dichlorophenol	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2,4-Dimethylphenol	50	ug/L	U	50	200
01/15/02	EFFLUENT	BNA-Water	2,4-Dinitrophenol	15	ug/L	U	15	60
01/15/02	EFFLUENT	BNA-Water	2,4-Dinitrotoluene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2,6-Dinitrotoluene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2-Chloronaphthalene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2-Chlorophenol	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	2-Methyl-4,6-dinitrophenol	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	2-Nitrophenol	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	3,3'-Dichlorobenzidine	40	ug/L	U	40	160
01/15/02	EFFLUENT	BNA-Water	4,4'-DDD	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	4,4'-DDE	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	4,4'-DDT	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	4-Bromophenyl phenyl ether	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	4-Chloro-3-methylphenol	1	ug/L	U	1	4

Date	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
01/15/02	EFFLUENT	BNA-Water	4-Chlorophenyl phenyl ether	2	ug/L	U	2	8
01/15/02	EFFLUENT	BNA-Water	4-Nitrophenol	15	ug/L	U	15	60
01/15/02	EFFLUENT	BNA-Water	Acenaphthene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Acenaphthylene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Aldrin	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	Anthracene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Benzidine	100	ug/L	U	100	400
01/15/02	EFFLUENT	BNA-Water	Benzo(a)anthracene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Benzo(a)pyrene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Benzo(b)fluoranthene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Benzo(g,h,i)perylene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Benzo(k)fluoranthene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Bis(2-chloroethoxy)methane	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Bis(2-chloroethyl)ether	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Bis(2-chloroisopropyl)ether	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	Bis(2-ethylhexyl)phthalate	15	ug/L	U	15	60
01/15/02	EFFLUENT	BNA-Water	Butyl benzyl phthalate	5	ug/L	U	5	20
01/15/02	EFFLUENT	BNA-Water	Chrysene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Di-n-butyl phthalate	5	ug/L	U	5	20
01/15/02	EFFLUENT	BNA-Water	Di-n-octyl phthalate	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Dibenzo(a,h)anthracene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Dieldrin	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	Diethyl phthalate	3.2	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Dimethyl phthalate	50	ug/L	U	50	200
01/15/02	EFFLUENT	BNA-Water	Endosulfan I	4	ug/L	U	4	16
01/15/02	EFFLUENT	BNA-Water	Endosulfan II	4	ug/L	U	4	16
01/15/02	EFFLUENT	BNA-Water	Endosulfan sulfate	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	Endrin	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	Endrin aldehyde	4	ug/L	U	4	16
01/15/02	EFFLUENT	BNA-Water	Fluoranthene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Fluorene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Heptachlor	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	Heptachlor epoxide	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	Hexachlorobenzene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Hexachlorobutadiene	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	Hexachlorocyclopentadiene	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	Hexachloroethane	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	Indeno(1,2,3-cd)pyrene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Isophorone	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	N-Nitrosodi-n-propylamine	2	ug/L	U	2	8
01/15/02	EFFLUENT	BNA-Water	N-Nitrosodimethylamine	2	ug/L	U	2	8
01/15/02	EFFLUENT	BNA-Water	N-Nitrosodiphenylamine	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	Naphthalene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Nitrobenzene	2	ug/L	U	2	8
01/15/02	EFFLUENT	BNA-Water	Pentachlorophenol	3	ug/L	U	3	12
01/15/02	EFFLUENT	BNA-Water	Phenanthrene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Phenol	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	Pyrene	1	ug/L	U	1	4
01/15/02	EFFLUENT	BNA-Water	alpha-BHC	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	beta-BHC	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	delta-BHC	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	BNA-Water	gamma-BHC	1.5	ug/L	U	1.5	6
01/15/02	EFFLUENT	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32

Date	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
01/15/02	EFFLUENT	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
01/15/02	EFFLUENT	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
01/15/02	EFFLUENT	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Ethoprop	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
01/15/02	EFFLUENT	GC-Water	Fonofos	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Hexazinone	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
01/15/02	EFFLUENT	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
01/15/02	EFFLUENT	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
01/15/02	EFFLUENT	GC-Water	Metribuzin	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
01/15/02	EFFLUENT	GC-Water	Naled	0.77	ug/L	U	0.77	3.08
01/15/02	EFFLUENT	GC-Water	Norflurazon	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
01/15/02	EFFLUENT	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096	0.384
01/15/02	EFFLUENT	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
01/15/02	EFFLUENT	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
01/15/02	EFFLUENT	Metals-Water	Aluminum	20	ug/L	U	20	80
01/15/02	EFFLUENT	Metals-Water	Arsenic	3	ug/L	U	3	12
01/15/02	EFFLUENT	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
01/15/02	EFFLUENT	Metals-Water	Calcium	54.7	mg/L		0.1	0.4
01/15/02	EFFLUENT	Metals-Water	Chromium	2	ug/L	U	2	8
01/15/02	EFFLUENT	Metals-Water	Copper	4.2	ug/L	I	3.5	14
01/15/02	EFFLUENT	Metals-Water	Iron_271	35	ug/L	U	35	140
01/15/02	EFFLUENT	Metals-Water	Lead	0.3	ug/L	U	0.3	1.2
01/15/02	EFFLUENT	Metals-Water	Magnesium	145	mg/L		0.25	1
01/15/02	EFFLUENT	Metals-Water	Nickel	4.1	ug/L	I	2	8
01/15/02	EFFLUENT	Metals-Water	Selenium	4	ug/L	U	4	16
01/15/02	EFFLUENT	Metals-Water	Silver	0.1	ug/L	U	0.1	0.4
01/15/02	EFFLUENT	Metals-Water	Zinc	4.5	ug/L	U	2	8
01/15/02	EFFLUENT	Nutrients-Liquid	Ammonia-N	0.068	mg N/L	A	0.01	0.02
01/15/02	EFFLUENT	Nutrients-Liquid	NO2NO3-N	89	mg N/L		0.8	2
01/15/02	EFFLUENT	Nutrients-Liquid	N_KJEL_TOT	1.5	mg N/L		0.06	0.2
01/15/02	EFFLUENT	Nutrients-Liquid	Nitrate-N	87	mg N/L	A	2	4
01/15/02	EFFLUENT	Nutrients-Liquid	O-Phosphate-P	13	mg P/L		0.4	1
01/15/02	EFFLUENT	Nutrients-Liquid	Total-P	13	mg P/L	A	0.3	0.8
01/15/02	EFFLUENT	Overflow	Oil and Grease	5	mg/L	U		
01/15/02	FIELD BLANK	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
01/15/02	FIELD BLANK	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
01/15/02	FIELD BLANK	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8

Date	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
01/15/02	FIELD BLANK	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
01/15/02	FIELD BLANK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
01/15/02	FIELD BLANK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
01/15/02	FIELD BLANK	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Benzidine	95	ug/L	U	95	380
01/15/02	FIELD BLANK	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
01/15/02	FIELD BLANK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
01/15/02	FIELD BLANK	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
01/15/02	FIELD BLANK	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
01/15/02	FIELD BLANK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
01/15/02	FIELD BLANK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
01/15/02	FIELD BLANK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
01/15/02	FIELD BLANK	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
01/15/02	FIELD BLANK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
01/15/02	FIELD BLANK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8

Date	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
01/15/02	FIELD BLANK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
01/15/02	FIELD BLANK	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
01/15/02	FIELD BLANK	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
01/15/02	FIELD BLANK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
01/15/02	FIELD BLANK	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
01/15/02	FIELD BLANK	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
01/15/02	FIELD BLANK	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
01/15/02	FIELD BLANK	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Ethoprop	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
01/15/02	FIELD BLANK	GC-Water	Fonofos	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Hexazinone	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
01/15/02	FIELD BLANK	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
01/15/02	FIELD BLANK	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
01/15/02	FIELD BLANK	GC-Water	Metribuzin	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
01/15/02	FIELD BLANK	GC-Water	Naled	0.77	ug/L	U	0.77	3.08
01/15/02	FIELD BLANK	GC-Water	Norflurazon	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
01/15/02	FIELD BLANK	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096	0.384
01/15/02	FIELD BLANK	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
01/15/02	FIELD BLANK	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
01/15/02	FIELD BLANK	Metals-Water	Aluminum	20	ug/L	U	20	80
01/15/02	FIELD BLANK	Metals-Water	Arsenic	3	ug/L	U	3	12
01/15/02	FIELD BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
01/15/02	FIELD BLANK	Metals-Water	Calcium	0.1	mg/L	U	0.1	0.4
01/15/02	FIELD BLANK	Metals-Water	Chromium	2	ug/L	U	2	8
01/15/02	FIELD BLANK	Metals-Water	Copper	1	ug/L	U	0.75	3
01/15/02	FIELD BLANK	Metals-Water	Iron_271	35	ug/L	U	35	140
01/15/02	FIELD BLANK	Metals-Water	Lead	0.3	ug/L	U	0.3	1.2
01/15/02	FIELD BLANK	Metals-Water	Magnesium	0.025	mg/L	U	0.025	0.1
01/15/02	FIELD BLANK	Metals-Water	Nickel	2	ug/L	U	2	8
01/15/02	FIELD BLANK	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
01/15/02	FIELD BLANK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
01/15/02	FIELD BLANK	Metals-Water	Zinc	4.5	ug/L	U	2	8
01/15/02	FIELD BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
01/15/02	FIELD BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
01/15/02	FIELD BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
01/15/02	FIELD BLANK	Nutrients-Liquid	Nitrate-N	0.02	mg N/L	U	0.02	0.04
01/15/02	FIELD BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
01/15/02	FIELD BLANK	Nutrients-Liquid	Total-P	0.015	mg P/L	U	0.015	0.04
01/15/02	FIELD BLANK	Overflow	Oil and Grease	5	mg/L	U		
01/15/02	TEST 1 A	Nutrients-Liquid	Ammonia-N	0.04	mg N/L		0.01	0.02

Date	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
01/15/02	TEST 1 A	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 1 A	Nutrients-Liquid	NO2NO3-N	1.8	mg N/L	J	0.02	0.05
01/15/02	TEST 1 A	Nutrients-Liquid	N_KJEL_TOT	0.18	mg N/L	I	0.06	0.2
01/15/02	TEST 1 A	Nutrients-Liquid	O-Phosphate-P	0.52	mg P/L		0.016	0.04
01/15/02	TEST 1 A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 1 A	Nutrients-Liquid	Total-P	0.45	mg P/L		0.015	0.04
01/15/02	TEST 1 A	Nutrients-Liquid	Turbidity	0.7	NTU		0.05	0.05
01/15/02	TEST 1 B	Nutrients-Liquid	Ammonia-N	0.035	mg N/L		0.01	0.02
01/15/02	TEST 1 B	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 1 B	Nutrients-Liquid	NO2NO3-N	0.96	mg N/L	J	0.008	0.02
01/15/02	TEST 1 B	Nutrients-Liquid	N_KJEL_TOT	0.17	mg N/L	I	0.06	0.2
01/15/02	TEST 1 B	Nutrients-Liquid	O-Phosphate-P	0.38	mg P/L		0.016	0.04
01/15/02	TEST 1 B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 1 B	Nutrients-Liquid	Total-P	0.37	mg P/L		0.015	0.04
01/15/02	TEST 1 B	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
01/15/02	TEST 3 A	Nutrients-Liquid	Ammonia-N	0.036	mg N/L		0.01	0.02
01/15/02	TEST 3 A	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 3 A	Nutrients-Liquid	NO2NO3-N	4.4	mg N/L		0.4	1
01/15/02	TEST 3 A	Nutrients-Liquid	N_KJEL_TOT	0.34	mg N/L	J	0.06	0.2
01/15/02	TEST 3 A	Nutrients-Liquid	O-Phosphate-P	0.85	mg P/L		0.02	0.05
01/15/02	TEST 3 A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 3 A	Nutrients-Liquid	Total-P	0.91	mg P/L		0.015	0.04
01/15/02	TEST 3 A	Nutrients-Liquid	Turbidity	0.75	NTU		0.05	0.05
01/15/02	TEST 3 A DUP	Nutrients-Liquid	Ammonia-N	0.036	mg N/L		0.01	0.02
01/15/02	TEST 3 A DUP	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 3 A DUP	Nutrients-Liquid	NO2NO3-N	4.6	mg N/L		0.4	1
01/15/02	TEST 3 A DUP	Nutrients-Liquid	N_KJEL_TOT	0.37	mg N/L	JA	0.06	0.2
01/15/02	TEST 3 A DUP	Nutrients-Liquid	O-Phosphate-P	0.75	mg P/L		0.02	0.05
01/15/02	TEST 3 A DUP	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 3 A DUP	Nutrients-Liquid	Total-P	0.86	mg P/L	A	0.015	0.04
01/15/02	TEST 3 A DUP	Nutrients-Liquid	Turbidity	0.7	NTU		0.05	0.05
01/15/02	TEST 3 B	Nutrients-Liquid	Ammonia-N	0.036	mg N/L	A	0.01	0.02
01/15/02	TEST 3 B	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 3 B	Nutrients-Liquid	NO2NO3-N	2.8	mg N/L	J	0.04	0.1
01/15/02	TEST 3 B	Nutrients-Liquid	N_KJEL_TOT	0.24	mg N/L	J	0.06	0.2
01/15/02	TEST 3 B	Nutrients-Liquid	O-Phosphate-P	0.82	mg P/L		0.02	0.05
01/15/02	TEST 3 B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 3 B	Nutrients-Liquid	Total-P	0.65	mg P/L		0.015	0.04
01/15/02	TEST 3 B	Nutrients-Liquid	Turbidity	0.85	NTU		0.05	0.05
01/15/02	TEST 6 A	Nutrients-Liquid	Ammonia-N	0.038	mg N/L		0.01	0.02
01/15/02	TEST 6 A	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 6 A	Nutrients-Liquid	NO2NO3-N	7.2	mg N/L	J	0.4	1
01/15/02	TEST 6 A	Nutrients-Liquid	N_KJEL_TOT	0.51	mg N/L	J	0.06	0.2
01/15/02	TEST 6 A	Nutrients-Liquid	O-Phosphate-P	1.1	mg P/L		0.02	0.05
01/15/02	TEST 6 A	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 6 A	Nutrients-Liquid	Total-P	1.2	mg P/L		0.03	0.08
01/15/02	TEST 6 A	Nutrients-Liquid	Turbidity	0.9	NTU		0.05	0.05
01/15/02	TEST 6 B	Nutrients-Liquid	Ammonia-N	0.027	mg N/L		0.01	0.02
01/15/02	TEST 6 B	Nutrients-Liquid	Color	5	PCU		5	5
01/15/02	TEST 6 B	Nutrients-Liquid	NO2NO3-N	7.3	mg N/L		0.4	1
01/15/02	TEST 6 B	Nutrients-Liquid	N_KJEL_TOT	0.56	mg N/L	J	0.06	0.2
01/15/02	TEST 6 B	Nutrients-Liquid	O-Phosphate-P	1.5	mg P/L		0.02	0.05
01/15/02	TEST 6 B	Nutrients-Liquid	TSS	4	mg/L	U	4	16
01/15/02	TEST 6 B	Nutrients-Liquid	Total-P	1.3	mg P/L		0.03	0.08
01/15/02	TEST 6 B	Nutrients-Liquid	Turbidity	0.95	NTU		0.05	0.05

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Gold Kist
County: Suwannee
Contact / District: Jay Jackson / NE-DIST
NPDES Permit #: FL0001465
LIMS Sample #: 571626 **LIMS Job #:** TLH-7002-01-16-41
sample log 01-24-02 mf
Test Type: (Screening) | Definitive
Static | Static Renewal | Flow-through
Test Number: 2 of 2

Sample Collection: Date 1/15/02 Time 1102
Test Beginning: Date 1/16/02 Time 13:35
Test Ending: Date 1/18/02 Time 1400
Organism Batch #: 2 **Diluent Batch #:** Well
Organism Age: 12 days SRT toxicant batch #: —
Test organism: C. dubia

Remarks:

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
CTRL H	C17	5	5	5	7.8	8.5	8.4	24.7	23.3	24.1	7.1	7.3	6.7	320	300	370
B	C18	5	5	5	8.0	8.6	8.4	25.9	23.1	24.2	7.3	7.2	6.8	285	280	330
C	C19	5	5	5	8.0	9.6	8.4	24.9	23.1	24.2	7.3	7.3	6.6	280	280	310
D	C20	5	5	5	8.0	8.6	8.4	25.9	24.1	24.4	7.3	7.3	6.5	280	280	300
100% H	C21	5	5	5	7.5	8.4	8.5	25.5	23.4	24.4	7.8	7.3	6.7	1598	1550	1500
B	C22	5	5	5	7.5	8.4	8.5	25.4	23.3	24.5	7.9	7.3	6.6	1660	1605	1620
C	C23	5	5	5	7.5	8.4	8.5	25.4	23.3	24.5	8.1	7.3	6.6	1665	1620	1650
D	C24	5	5	5	7.5	8.4	8.5	25.4	23.4	24.3	8.1	7.2	6.5	1675	1630	1660
														1625	F.O	
														Pull		
														0.05 SA 1/16/02		
measured by:		DH	GH	SA	DH	SA	GH	DH	SA	GH	DH	SA	GH	DPL	SA	GH
recorded by:		RR	GH	SA	SA	GH	SA	SA	GH	SA	SA	GH	SA	SA	GH	SA

DATA TRANSCRIPTION VERIFIED
Date 5/25/02
Initials SA

Investigators' Signatures

Temperature Range °C
Incubator # (3) 25.0-25.5°C
Room ~~24.0-24.5~~ ~~25.0~~°C
22.0-23.5°C 5/21/02 DH

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			—	—	—	—
Lab Total Residual Cl2 (mg/L):	<0.03		0.05	Hach	SA	SA
Alkalinity (mg/L as $CaCO_3$):	138		348	Hach	SA	SA
Hardness (mg/L as $CaCO_3$):	130		740	Hach	SA	SA
Total ammonia (mg/L as N):	<0.017		<0.017	Denver	DH	SA
Salinity:	<1		<1	YSI	DH	SA

reviewer form updated 3/3/99

000094

STATE OF FLORIDA
DEPT. OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT

Division of Water Facilities
Surface Water Section

MICROBIOLOGICAL ANALYSIS REPORT

NAME OF SURVEY			COLLECTOR
Gold Kist			Orielly, Jackson Oconnor, Kallemeyn
DATE: COLLECTED	**RECEIVED**	**PROCESS START**	**COMPLETED**
01/15/02	17:00 01/15/02	17:10 01/15/02	15:55 01/16/02
SURVEY TYPE	**SAMPLE TYPE**	**COUNTY**	**ANALYTICAL METHOD**
Industrial Waste Compliance	Suwannee River and Final Effluent	Jefferson	Membrane Filter
ANALYST	**COMMENTS**		
Kallemeyn Mason	# 020032 – 020035 Completed 01/16/02 15:20		

LAB NO.	STORET NO.	SITE LOCATION	COLL TIME	SET UP TIME	TOTAL COLIFORM		FECAL COLIFORM	
					#/100ML	CODE	#/100ML	CODE
020025		Gold Kist Test 1B	10:05	15:58	270		100	
020026		Test 1A	10:15	15:58	290		60	B
020027		Test 3A	10:30	15:58	440		96	
020028		Test 3A dup	10:30	15:58	280		40	B
020029		Test 3B	10:35	15:58	420		100	
020030		Test 6B	10:50	16:30	340		211	A
020031		Test 6A	10:55	16:30	250		68	B
020032		Control 30A	10:15	15:23	310		84	
020033		Control 30B	10:20	15:23	350		98	
020034		Control 100A	10:35	15:23	180		68	B
020035		Control 100B	10:40	15:23	240		68	B
020036		Goldkist Final Effluent	11:37	16:30	220		4	K

RESULTS APPROVED BY:	DATE
Tom Kallemeyn	1/22/02

STATE OF FLORIDA
DEPT. OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT

MICROBIOLOGICAL ANALYSIS REPORT

REMARK CODES

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

B - Results based on colony counts outside the acceptable range.

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

J - Estimated Value.

K - Actual value is known to be less than value given.

L - Actual value is known to be greater than value given.

N - Presumptive evidence of presence of material.

O - Sampled, but analysis lost or not performed.

Q - Sample held beyond normal holding time.

T - Value reported is less than the criterion of detection.

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

V - Analyte was detected in both sample and method blank.

Z - Colonies were too numerous to count (TNTC).

Examples: 20 colonies from 1ml of sample would be reported as 2000 / 100ml.
2 colonies from 1ml of sample would be reported as 200B / 100ml.
30 colonies from 1ml of sample that exceeded holding time would be reported as 100Q / 100ml.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/13/01	3:30	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
GULF KIST DYE STUDY		SUWANNEE RIVER	TEST 6,4

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

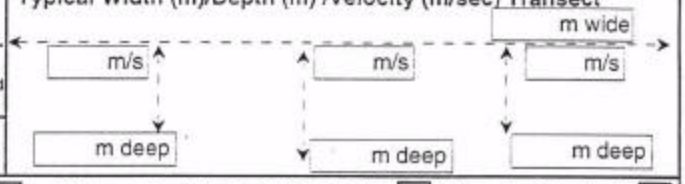
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top 0.6	~~Z1.00~~	21.60	7.57	11.17	355			1.2 L
Mid-depth								
Bottom	1.0	20.99	7.58	11.07	347			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
	Jay Hacker	12/13/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	3:25	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Field Kist Dye Study		Suwannee River	Test 3B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

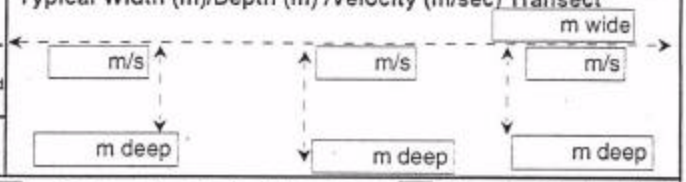
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

Artificially Channelized ☐ no ☐ ☐ ☐ ☐ recent, severe / some recovery / mostly recovered

Artificially Impounded ☐ yes more sinuous

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.5	21.0	7.6	10.7	330			
Mid-depth								
Bottom	2.6	21.0	7.6	10.7	342			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
	Jay A Jackson	12/18/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	3:37	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		SUWANNEE RIVER	TEST 6B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: ***List & map dominant vegetation on back***

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

m wide

Artificially Channelized ☐ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

m/s	m/s	m/s
m deep	m deep	m deep

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	**Substrate Types**	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.6	20.9	7.7	11.4	388			
Mid-depth								
Bottom	1.5	20.7	7.7	10.8	273			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
	Jon A Jeter	12/18/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	3:15	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Suwannee River	Test 3A

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: ***List & map dominant vegetation on back***

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

m wide

Artificially Channelized ☐ no ☐ ☐ ☐ recent, severe, some recovery, mostly recovered

Artificially Impounded ☐ yes more sinuous

m/s	m/s	m/s
m deep	m deep	m deep

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	**Substrate Types**	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.6	21.1	7.6	11.0	338			
Mid-depth								
Bottom	1.5	21.0	7.6	10.5	334			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE
	[signature]	12/18/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	2:50 P	SUWANNEE RIVER

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
GOLD KIST DYE STUDY		SUWANNEE RIVER	TEST 1A

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

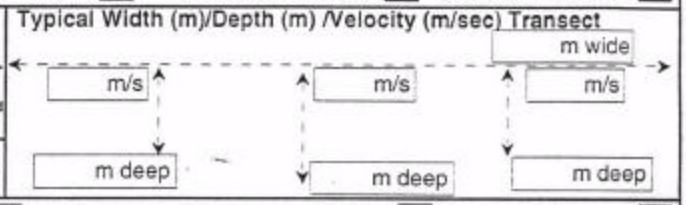
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.6	20.6	7.5	10.9	275			1.0 B
Mid-depth								
Bottom	3.2	20.7	7.5	10.7	287			

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:

SLIGHT BREEZE, CLEAR SKIES, 70's

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

SAMPLING TEAM:	SIGNATURE:	DATE:
JJKEEGAN, JRILEY, PCONNOR		12/18/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	3:00 P	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Gold Kist Dye Study		Suwannee River	Test 1B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

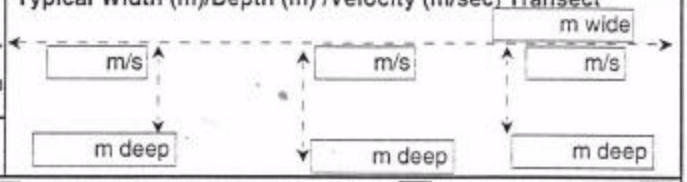
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.6	20.7	7.2	10.7	251			VOB
Mid-depth								
Bottom	2.7	20.5	7.6	10.7	301			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
J Jackson T Riley, PCCounce		12/18/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/07	4:12	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Bold Kist Dye Study		Suwannee River	Control 100 B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: *List & map dominant vegetation on back*

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

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

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

m wide

m/s	m/s	m/s
m deep	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 Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.3	20.54	7.40	8.50	299			
Mid-depth								
Bottom	0.5	20.59	7.41	8.57	299			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
		12/18/07

8.14 300
8.31 300
7.45 7.72
20.55 20.52
0.3 0.5
1 of 2 Bottom
4:15p Control 100 A

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	4:03	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Rhodamine Dye Study		Suwannee River	30A Control

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

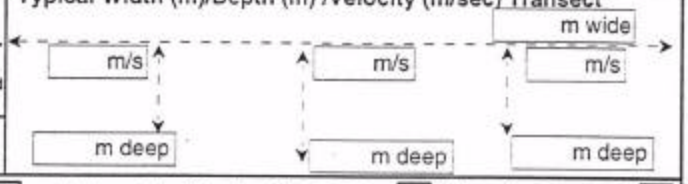
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

Artificially Channelized ☐ no ☐ ☐ ☐ ☐ recent, severe / some recovery / mostly recovered

Artificially Impounded ☐ yes more sinuous

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.3	20.54	7.58	7.47	300			0.9
Mid-depth								
Bottom	0.5	20.54	7.65	7.96	300			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
		12/18/01

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		12/18/01	3:57	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Good Kist Dye Study		Suwannee River	Control 30 B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

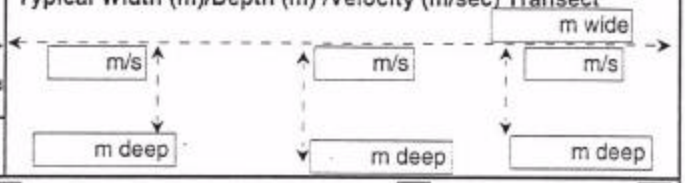
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.5	20.5	7.4	8.6	300			
Mid-depth			7.5					
Bottom	0.7	20.6	~~7.0~~	8.0	300			

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
		12/03/01

JULIE) SNAG ||||
BARK |||| VII ROOTS |||

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

0.0

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (S-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/15/02	10:50	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Test 6B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: ***List & map dominant vegetation on back***

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

m wide | m/s | m/s | m/s | m deep | m deep | m deep

Artificially Channelized ☐ no ☐ ☐ ☐ ☐ recent, severe / some recovery / mostly recovered

Artificially Impounded ☐ yes more sinuous

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		16.85	7.54	7.20	398.00			
Mid-depth								
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:

N 30°21'55.8"
W 083°11'30.3"
*8.2 ppb

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

SAMPLING TEAM:	SIGNATURE:	DATE:
J. Richardson T. Jackson T. Hillsman		11/15/02

* control site 30A reading was 3.4 ppb background water ± 3.4 ppb (@ 100 m)

.16 velocity

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	10:40	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FH	Test 6A

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: ***List & map dominant vegetation on back***

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

m wide

m/s m/s m/s

m deep m deep m deep

Artificially Channelized ☐ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		16.46	7.57	7.45	374.00			
Mid-depth								
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:
N 30° 21' 56.1"
W 083° 11' 29.8"
10.8 ppt

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

SAMPLING TEAM:	SIGNATURE:	DATE:
J. Rolando J. Tubbs T. Kellemeyer		1/15/02

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	10:25	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Test 3A

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: ***List & map dominant vegetation on back***

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

m wide

Artificially Channelized ☐ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

m/s	m/s	m/s
m deep	m deep	m deep

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	**Substrate Types**	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		16.77	7.56	7.25	357.0			
Mid-depth								
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:
N30°21'54.5"
W 83°11'29.7"
5.2 ppb

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

SAMPLING TEAM: J. Richardson, J. Jackson, Tom Gallagher

SIGNATURE: [signature]

DATE: 1/15/02

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	10:30	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Test 3B

RIPARIAN ZONE/INSTREAM FEATURES

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

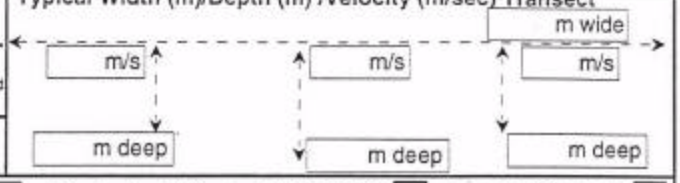
Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

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: ***List & map dominant vegetation on back***

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



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

Artificially Impounded ☐ yes

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		11.41	7.63	7.00	344.00			
Mid-depth								
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:

6.2 ppb

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

SAMPLING TEAM: T. Richardson J Jackson, Tom Kilkenny

SIGNATURE:

DATE: 1/15/02

33 sp per meter

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	10:05	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist Fyl	Test 1B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

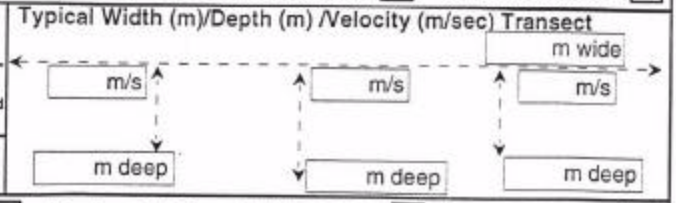
Width of riparian vegetation (m) on least buffered side: *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		16.73	7.42	7.26	3/2.00			
Mid-depth								
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:
N 30° 21' 51.0"
W 83° 11' 30.0"
± 35 ppb

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

SAMPLING TEAM: J. Richardson, J. Hatcher, Tim Kelley | SIGNATURE: | DATE:

.Q ± 200 meters downstream. Last reading was ± 38 ppb

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	10:15	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Test 1A

RIPARIAN ZONE/INSTREAM FEATURES

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

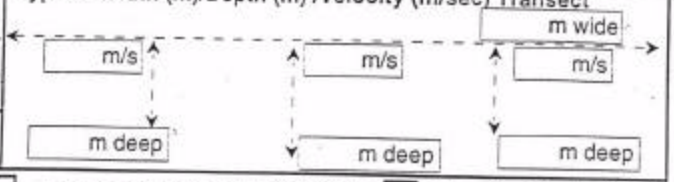
Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

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: ***List & map dominant vegetation on back***

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



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

Artificially Impounded ☐ yes

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

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		16.74	7.55	6.85	317.00			
Mid-depth								
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:
N 30° 21' 51.5"
W 83° 11' 29.7"
3.64 pob

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

SAMPLING TEAM: J. Richardson, J. Jackson, Tom Kallemeyn SIGNATURE: DATE: 1/15/2

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	1015	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Control 30 A

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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: *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

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

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

½ the river — 30 m wide

m/s	0.25 m/s	0.25 m/s
m deep	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 Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	1	8		Sand			
Leaf Packs or Mats				Mud/Muck/Silt	3	4	
Aquatic Vegetation				Other:			
Rock or Shell Rubble	96	8		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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.3	16.7	7.6	10	309			0.62
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: RAIN PREVIOUS 24 HRS
OVERCAST COOL 55°F
EPE 17' DOP 1.3 N30 21 57.7 W83 11 30.3 A

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

SAMPLING TEAM:	SIGNATURE:	DATE:
FSPA Riley, O'Connor		1/15/02

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	1015	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Control 30 B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

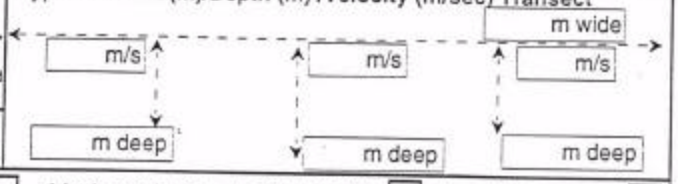
Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or 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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.3	16.1	7.6	9.7	309			1.02
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:
EPE 17 Def +3 to 1.3
30 21 57.4 83 11 30.1

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

SAMPLING TEAM:	SIGNATURE:	DATE:
RILEY, O'CONNOR, ESPY		

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	1045	Savannah River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist EYI	Control 100 A

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

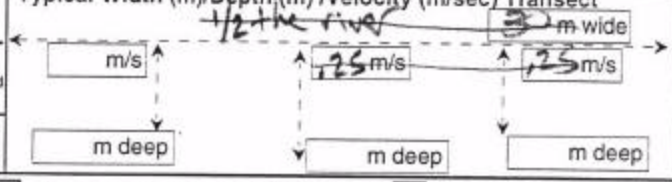
Width of riparian vegetation (m) on least buffered side: *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	1	3	VOB	Sand			
Leaf Packs or Mats	*			Mud/Muck/Silt	3	4	VOB
Aquatic Vegetation				Other:			
Rock or Shell Rubble	96	3	VOB	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. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.3	16.7	7.7	9.7	309			VOB
Mid-depth								
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: * SHOULD'VE BEEN RECORDED AS CONTROL 30A

30° 22' 00.1"
83° 11' 29.5"

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

SAMPLING TEAM:	SIGNATURE:	DATE:
	[signature]	1/15/02

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/15/02	1045	Suwannee River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Control 100 B

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

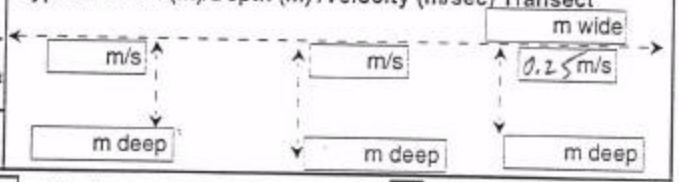
Width of riparian vegetation (m) on least buffered side: *List & map dominant vegetation on back*

Artificially Channelized ☐ no ☐ ☐ ☐ ☐ recent, severe, some recovery, mostly recovered

Artificially Impounded ☐ yes more sinuous

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	1	10		Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble	99	10		Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

Lime

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.3	16.7	7.7	9.8	309			
Mid-depth								
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: EPE 33ft
30° 22' 00.1"
83° 11' 31.0"
DOP 2.5

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

SAMPLING TEAM:	SIGNATURE:	DATE:

Appendix 4: Principal components analysis: gradients related to the Gold Kist outfall

Physical and chemical data were analyzed using Principal Component Analysis (PCA) following Clarke and Warwick (2001). Nutrients analyzed included ammonia, nitrate plus nitrite, total Kjeldahl nitrogen and total phosphorus. Physical variables included temperature, dissolved oxygen, pH, turbidity and conductivity. Nitrate plus nitrite and total phosphorus were square-root transformed to remove skewness, and all variables were normalized to a mean of zero and a standard deviation of one. December 2001 and January 2002 data were analyzed separately.

PCA results were similar on both dates, clearly reflecting the strong gradient associated with the Gold Kist outfall (Appendix Figures 4.1, 4.2, Appendix Tables 4.1, 4.2). The first two principal components explained >85% of the variance in physical and chemical parameters. The first principal component explained ~70% of the total variance and was weighted on nitrate plus nitrite, total phosphorus, total Kjeldahl nitrogen, temperature and conductivity. The second principal component was most heavily weighted on ammonia, pH and dissolved oxygen.

On both dates, sampling locations were oriented along the first PCA axis by position on the outfall gradient: Test 6A and 6B, Test 3A and 3B, Test 1A and 1B, followed by the four upstream control sites (Control 30A, 30B, Control 100A, 100B, Appendix Figures 4.1, 4.2). Results for the two dates are mirror images, due to slight differences in the pattern of dissolved oxygen with location between dates.

Concentrations of nutrients released by the outfall were strongly correlated with the dye dilution gradient (Appendix Table 4.3).

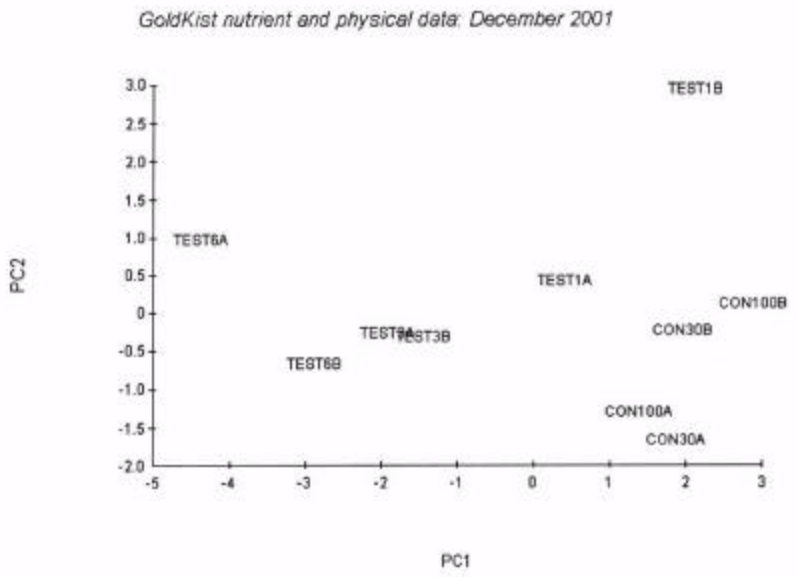
Appendix Table 4.1. Principal components weightings and variance explained: December 2001

Variable	Principal Component 1	Principal Component 2
Ammonia (NH_3)	-0.197	-0.638
Total Kjeldahl nitrogen	-0.392	0.072
Nitrate plus nitrite	-0.389	0.096
Total phosphorus	-0.392	0.087
Turbidity	-0.304	0.134
Temperature	-0.375	0.180
pH	-0.231	-0.595
Dissolved oxygen	-0.303	0.374
Conductivity	-0.353	-0.165
Percent of variance explained	68.4	18.4
Cumulative percent variance	68.4	86.8

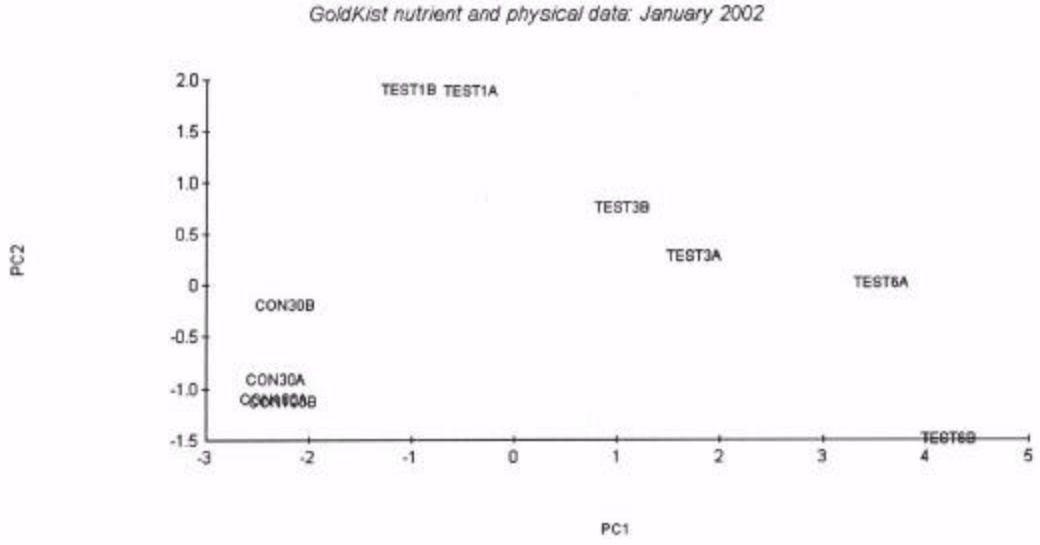
Appendix Table 4.2. Principal components weightings and variance explained: January 2002		
Variable	Principal Component 1	Principal Component 2
Ammonia (NH_3)	0.043	0.676
Total Kjeldahl nitrogen	0.374	-0.233
Nitrate plus nitrite	0.396	-0.017
Total phosphorus	0.395	-0.076
Turbidity	0.383	0.079
Temperature	0.384	-0.168
pH	-0.136	-0.385
Dissolved oxygen	-0.294	-0.513
Conductivity	0.382	-0.194
Percent of variance explained	70.0	16.6
Cumulative percent variance	70.0	86.6

Appendix Table 4.3. Correlations between dye concentration and nutrient concentration downstream of the Gold Kist Processing Plant outfall: December 18, 2001,and January 15, 2002			
Comparison	Correlation coefficient (r^2)	Probability	N
December: Dye concentration vs. NO_2+NO_3	0.998	P<0.001	7
January: Dye concentration vs. NO_2+NO_3	0.996	P<0.001	7
December: Dye concentration vs. TP*	0.998	P<0.001	7
January: Dye concentration vs. TP*	0.998	P<0.001	7
* TP = total phosphorus, NO_2+NO_3 = nitrate plus nitrite			

Appendix Figure 4.1
A.



B.



Appendix Figure 4.1. Principal components analysis, Gold Kist physical and chemical data. A. December 2001, B. January 2002.

Appendix 5. Algal Growth Potential (AGP) Analyses

Water was collected from each sample point (n=10) in December 2001 and January 2002 site visits, and AGP measured for each sample (Miller et al. 1978). Data were transformed using the square root to meet the assumption of homogeneity of variances (Cochran's C statistic, $p > 0.05$, Winer 1971) and analyzed with two-way ANOVA using Statistica™. There was a highly significant effect of location, but not of date or the interaction between date and location (Appendix Table 5.1).

Sample points upstream of the outfall had significantly lower AGP than those receiving effluent (Figure 4 in text) in both December 2001 and January 2002. AGP increased by approximately a factor of five (~25 mg dry weight/L upstream, ~135 mg dry weight/L at Test 6A, 6B and Test 3A, 3B), but was intermediate at Test1A, 1B (Appendix Table 5.1, Table 3 in text).

It is possible to calculate the expected yield (AGP value) using the concentration of nutrients in the water tested (Miller et al. 1978) and assuming required compounds are present in excess. The expected amount of production is calculated as 38 times total soluble inorganic nitrogen (TSIN, nitrate plus nitrite plus ammonia) or 430 times ortho-phosphorus (OP). Both estimates have an error of ± 20% (Miller et al. 1978). If the nitrogen (N) to phosphorus (P) ratio is less than 11:1, then it is probable that N is limiting algal growth rather than P (Miller et al. 1978). In the vicinity of the Gold Kist outfall, N:P ratios were ≤8.1 (Table 1, Appendix Table 5.2), making N limitation more likely. Calculated values for nitrogen and phosphorus limitation based on the formulas given above are shown in Appendix Table 5.2 and discussed further in the text.

Appendix Table 5.1. Analysis of variance table: Algal growth potential (square root transformed) in mg dry weight/L

Effect	Sum of squares	Degrees of freedom	Mean square	F	Probability
Location	170.856	4	42.714	8.5547	.003
Date	13.791	1	13.791	2.7620	.128
Date x Location	24.751	4	6.188	1.2393	.355
Error	49.931	10	4.993		

Appendix Table 5.2. Measured and predicted algal growth potential (AGP) for total soluble inorganic nitrogen (TSIN) and ortho-phosphorus (OP) limitation				
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	N:P ratio
A. December 2001				
Control 100A	24.3	16.8 ± 3.4	103.2 ± 20.6	1.8
Control 100B	22.6	17.2 ± 3.4	103.2 ± 20.6	1.9
Control 30A	25.5	17.3 ± 3.5	98.9 ± 19.8	2.0
Control 30B	23.5	17.2 ±3.4	98.9 ± 19.8	2.0
Effluent	53.3	3763.8 ± 752.8	5590.0 ± 1118.0	7.6
Test 6A	91.1	494.9 ± 99.0	688.0 ± 137.6	8.1
Test 6B	254.0	213.7 ± 42.7	645.0 ± 129.0	3.7
Test 3A	214.0	217.5 ± 43.5	374.1 ± 74.8	6.6
Test 3A Duplicate	369.0	209.9 ± 42.0	430.0 ± 86.0	5.5
Test 3B	203.0	183.3 ± 36.7	399.9 ± 80.0	5.2
Test 1A	154.0	137.7 ± 27.5	275.2 ± 55.0	5.7
Test 1B	28.5	20.5 ± 4.1	249.4 ± 49.9	0.9
B. January 2002				
Control 100A	28.3	21.3 ± 4.3	137.6 ± 27.5	1.8
Control 100B	27.9	21.7 ± 4.3	141.9 ± 28.4	1.7
Control 30A	27.7	21.7 ± 4.3	137.6 ± 27.5	1.8
Control 30B	26.3	21.8 ± 4.4	35.3 ± 7.1	7.0
Effluent	34.3	3308.6 ± 661.7	5590.0 ± 1118.0	6.7
Test 6A	103.0	275.0 ± 55.0	473.0 ± 94.6	6.6
Test 6B	116.0	278.4 ± 55.7	645.0 ± 129.0	4.9
Test 3A	74.4	168.6 ± 33.7	365.5 ± 73.1	5.2
Test 3A Duplicate	88.9	176.2 ± 35.2	322.5 ± 64.5	6.2
Test 3B	80.2	107.8 ± 21.6	352.6 ± 70.5	3.5
Test 1A	85.2	69.9 ± 14.0	223.6 ± 44.7	3.5
Test 1B	40.4	37.8 ± 7.6	163.4 ± 32.7	2.6
See text for further explanation.				

Appendix 6: Periphyton collections by size class, Suwannee River upstream and downstream of the Gold Kist outfall

Appendix Table 6.1, Periphyton ≤1mm long collected from shoreline transects up and downstream of the Gold Kist outfall, January 15, 2002

	Downstream				Upstream		
Species	0-10m	50-60m	100-110m	130-140m	0-10m	50-60m	90-100m
Chlorella sp.	x	x	x	x	x	x	x
Anabaena sp.	x	x	x	x	x	x	x
Oscillatoria #1	x	x		x	x	x	x
Oscillatoria #2					x		
Oscillatoria #4			x		x		
Oscillatoria #7				x			
Oscillatoria tenuis	x				x		
Oscillatoria Formosa	x	x		x	x	x	
Oscillatoria acutissima	x				x		
Oscillatoria agardhii	x						
Oscillatoria granulata			x				x
Oscillatoria subbrevis						x	
Lyngbya sp.	x						
Lyngbya #1	x						
Lyngbya #2		x	x	x	x	x	x
Lyngbya major		x			x		
Lyngbya aerugineo-caerulea	x	x	x	x	x	x	x
Lyngbya birgei					x		
Ulothrix cf. zonata						x	
Ulothrix sp.	x	x	x	x	x	x	x
Cyanobium parvum	x	x	x	x	x	x	x
Cyanobium plancticum	x	x	x	x	x	x	x
Oocystis sp.	x				x		
Chlorococcum sp.	x	x	x	x	x	x	x
Chlorococcaceae	x			x	x		x
Scenedesmus quadricauda	x	x	x	x	x	x	x
Scenedesmus abundans	x		x	x			
Scenedesmus dimorphus	x	x	x			x	x
Scenedesmus bijuga	x	x	x	x	x	x	x
Scenedesmus dispar			x				
Scenedesmus acuminatus			x	x	x		x
Scenedesmus acutus				x		x	x
Scenedesmus acutiformis					x	x	
Scenedesmus brevispina				x	x		
Scenedesmus smithii					x		x
Scenedesmus soli				x			
Scenedesmus sp.	x	x	x	x	x	x	x
Aphanocapsa sp.	x	x	x	x	x	x	x
Cyanothece aeruginosa	x						
Characium pringsheinii	x						
Characium sp.			x	x	x	x	x
Chroococcus dispersus							x
Chroococcus limneticus							x
Chroococcus minutus	x	x	x	x	x	x	x
Chroococcus turgidus			x		x		
Chroococcaceae	x	x	x	x	x		x
Coelastrum microporum	x						
Actinotaenium truncatum	x					x	

Appendix Table 6.1, continued. Periphyton ≤1mm long collected from shoreline transects up and downstream of the Gold Kist outfall, January 15, 2002							
Actinotaenium sp.					x		
Scytonema sp.	x	x	x				
Cosmarium calcareum v. calcareum	x	x					
Cosmarium variolatum	x		x		x		
Cosmarium variolatum v. cataractarum						x	
Cosmarium pseudoretusum v. pseudoretusum	x						
Cosmarium pseudoretusum						x	
Cosmarium sp.				x	x		
Gloeothece sp.	x		x				
Cyanosarcina sp.	x						
Hydrodictyon reticulatum	x	x			x	x	x
Hydrodictyon sp.					x		
Oedogonium #2	x	x	x	x	x	x	x
Closterium lunula	x	x	x	x		x	x
Closterium dianae-pseudoleibleinii			x				
Closterium libellula					x	x	x
Selenastrum sp.	x						
Microcoleus sp.	x						
Microchaete sp.	x						
Microcystis sp.	x			x	x		
Spirogyra sp.	x					x	
Ankistrodesmus falcatus	x						
Unknown green filament	x		x	x			x
Microspora sp.		x				x	x
Golenkinia sp.		x					
Dichotomosiphon sp.		x					
Merismopedia punctata		x		x			x
Merismopedia tenuissima			x	x		x	
Coelomoron sp.			x	x			x
Cladophora sp.				x			
Tribonema sp.				x			
Cylindrospermum sp.				x		x	x
Pithophora sp.					x		
Chamaesiphon sp.						x	
Nostoc commune						x	
Aphanothece nidulans						x	
Taxa count	44	28	31	35	39	35	33

Appendix Table 6.2. Periphyton collected from shoreline transects up and downstream of the Gold Kist outfall,
January 15, 2002

Algal height class	>50mm	10-50mm	1<10mm
A. 0-10m downstream Sample #571669	*Rhizoclonium hookei* ++++ *Rhizoclonium hieroglyphicum* ++ *Cladophora sp.* + *Hydrodictyon reticulatum* + *Hydrodictyon #2* ++ *Oedogonium #2* + *Dichomosiphon tuberosus* + *Microcoleus sp.* + *Lyngbya birgei* + *Lyngbya spp.* + *Oscillatoria spp.* + *Anabaena sp.* +	*Rhizoclonium hookei* ++ *Rhizoclonium hieroglyphicum* + *Cladophora sp.* + *Oedogonium #2* + *Hydrodictyon #2* +	*Rhizoclonium hookei* + *Rhizoclonium hieroglyphicum* + *Cladophora sp.* + *Oedogonium #2* + *Hydrodictyon #2* ++ *Dichomosiphon tuberosus* + *Enteromorpha sp.* + *Hydrodictyon reticulatum* +
B. 50-60m downstream Sample #571670	*Dichomosiphon tuberosus* +++ *Rhizoclonium hookei* +++ *Cladophora sp.* + *Oedogonium #2* + *Hydrodictyon #2* + *Spirogyra crassa* + *Characium sp.* + *Chamaesiphon sp.* + *Oscillatoria sp.* + *Lyngbya sp.* +	*Dichomosiphon tuberosus* +++ *Rhizoclonium hookei* + *Cladophora sp.* + *Oedogonium #2* +	*Dichomosiphon tuberosus* ++ *Oedogonium #2* + *Hydrodictyon #2* + *Anabaena sp.* + *Oscillatoria sp.* + *Closterium sp.* + *Calothrix sp.* +

Appendix Table 6.2, continued. Periphyton collected from shoreline transects up and downstream of the Gold Kist outfall, January 15, 2002			
C. 100-110m downstream Sample #571671	*Microspora crassior* ++++ *Oedogonium #2* +++ *Rhizoclonium hookei* ++ *Rhizoclonium hieroglyphicum* + *Hydrodictyon #2* + *Characium sp.* +++ *Cladophora sp.* +	*Microspora crassior* +++ *Rhizoclonium hookei* ++ *Rhizoclonium hieroglyphicum* + *Oedogonium #2* ++ *Hydrodictyon #2* + *Cladophora* + *Stigeoclonium sp.* + *Hydrodictyon #4* +	*Rhizoclonium hookei* ++ *Microspora crassior* + *Oedogonium #2* + *Cladophora* +
D. 130-140m downstream Sample #571672	*Rhizoclonium hookei* +++ *Cladophora spp.* +++ *Rhizoclonium hieroglyphicum* ++ *Cladophora cf. glomerata* + *Pithophora sp.* + *Hydrodictyon #3* + *Oedogonium #2* +	*Cladophora spp.* ++ *Oedogonium #2* + *Rhizoclonium hookei* + *Rhizoclonium hieroglyphicum* +	*Cladophora spp.* ++ *Rhizoclonium hookei* ++ *Oedogonium #2* + *Rhizoclonium hieroglyphicum* + *Hydrodictyon #4* + *Oscillatoria #1* +
E. 0-10m upstream Sample #571673	*Hydrodictyon reticulatum* ++++ *Hydrodictyon #2* ++++ *Rhizoclonium hookei* +++ *Hydrodictyon #3* ++ *Rhizoclonium hieroglyphicum* ++ *Hydrodictyon #4* + *Cladophora spp.* + *Oedogonium #2* + *Oscillatoria #1* + *Lyngbya #2* +	*Hydrodictyon reticulatum* ++++ *Hydrodictyon #2* ++ *Hydrodictyon #3* ++ *Rhizoclonium hookei* + *Rhizoclonium hieroglyphicum* + *Cladophora spp.* + *Oedogonium #2* + *Chamaesiphon sp.* + *Oscillatoria sp.* + *Lyngbya sp.* +	*Hydrodictyon reticulatum* ++ *Hydrodictyon #3* ++ *Hydrodictyon #2* + *Hydrodictyon #4* + *Rhizoclonium hookei* + *Oedogonium #2* + *Enteromorpha sp.* + *Chamaesiphon sp.* +

Appendix Table 6.2, continued. Periphyton collected from shoreline transects up and downstream of the Gold Kist outfall, January 15, 2002

F. 50-60m upstream	*Rhizoclonium hookei* ++++	*Hydrodictyon reticulatum* +++	*Rhizoclonium hookei* ++
Sample #571674	*Hydrodictyon reticulatum* +++	*Rhizoclonium hookei* ++	*Hydrodictyon reticulatum* +
	Hydrodictyon #2 +	*Hydrodictyon #2* +	*Hydrodictyon #2* +
	Hydrodictyon #3 +	*Hydrodictyon #3* +	*Hydrodictyon #3* +
	Hydrodictyon #4 +	*Hydrodictyon #4* +	*Oedogonium #2* +
	Cladophora spp. +	*Oedogonium #2* +	*Ulothrix sp.* +
	Pithophora sp. +	*Pithophora sp.* +	*Anabaena sp.* +
	Characium sp. +	*Ulothrix sp.* +	*Oscillatoria #1* +
	Chamaesiphon sp. +	*Spirogyra sp.* +	*Lyngbya #2* +
	Oscillatoria kuetzingii +	*Cladophora spp.* +	
	Oscillatoria epiphytica +		
	Oscillatoria spp. +		
	Lyngbya spp. +		
G. 90-100m upstream	*Rhizoclonium hookei* ++++	*Rhizoclonium hookei* +++	*Rhizoclonium hookei* +
Sample #571675	*Rhizoclonium hieroglyphicum* ++	*Rhizoclonium hieroglyphicum* ++	*Oedogonium #2* +
	Hydrodictyon reticulatum ++	*Cladophora spp.* +	*Pithophora sp.* +
	Cladophora spp. ++	*Oedogonium #2* +	*Cladophora cf glomerclonium* +
	Oedogonium #2 +	*Pithophora sp.* +	*Cladophora spp.* +
	Pithophora sp. +	*Ulothrix sp.* +	*Hydrodictyon reticulatum* +
	Hydrodictyon #2 +	*Hydrodictyon #2* +	*Hydrodictyon #3* +
	Hydrodictyon #3 +	*Hydrodictyon #3* +	*Hydrodictyon #4* +
	Oscillatoria #1 +		
	Lyngbya #2 +		

Note: Rank abundance indicated by +, + present, ++ frequent, or +++ major component of collection.

Appendix 7. Macroinvertebrates collected during periphytometer retrieval

Appendix Table 7.1 summarizes identifications of grazers found on periphytometers on January 15, 2002. Collections of grazers were incomplete, but we attempted to collect as many as possible during retrieval. Counts are therefore underestimates of grazer density.

Appendix Table 7.1. Invertebrates collected from periphytometers, January 15, 2002	
Control 100A	**Gyrinidae** (larvae and eggs), Planorbidae, *Physella*, Baetidae, Chironomidae (20)
Test 6A	***Physella***, Simuliunon, Leptocenidae, Baetidae, Chironomidae (25)
Test 6B	**Baetidae**, *Hydropsyche*, *Physella, Simuliunon, Hydroptila*, Chrironomidae (51)
Test 3A	**Baetidae,** Plecoptera, *Physella*, Chrionomidae (16)
Test 3B	**Baetidae**, *Physella*, Plecoptera, Planorbidae, *Pseudosuccinea*, Chrionomidae (28)
Test 1A	**Baetidae**, *Physella*, Chironomidae, *Chematopsyche*, Gryrinidae, *Simuliunon* (21)
Test 1B	**Baetidae**, *Physella, Hydropsyche, Pseudosuccinea*, Leptocaridae (7)
Partial collection of invertebrates colonizing periphytometers. Group in bold face was most abundant in collections. Number in parentheses is number of invertebrates collected.	

Appendix 8. Qualitative Stream Condition Index Data

Appendix Table 8.1. Macroinvertebrate taxa from Stream Condition Index samples, January 15, 2001

Scientific Name	Control 100 SCI	Test 110 SCI	Control 30 SCI	Test 10 SCI
Hydra	0	0	0	8
Planariidae	0	1	0	2
Prostoma	0	0	1	0
Limnodrilus	0	1	0	2
Limnodrilus hoffmeisteri	0	0	3	0
Haber speciosus	0	3	1	1
Slavina appendiculata	0	0	0	2
Stylaria lacustris	0	3	0	35
Pristina	0	0	1	0
Pristina leidyi	0	0	0	3
Pristina synclites	0	0	0	2
Nais communis complex	0	0	3	3
Viviparus georgianus	0	2	0	0
Hydrobiidae	1	8	2	1
Amnicola	0	2	0	4
Elimia	1	0	1	3
Ferrissia	0	0	0	1
Planorbidae	0	0	1	0
Micromenetus dilatatus	4	32	0	0
Bivalvia	0	0	0	1
Corbicula manilensis	13	0	4	0
Pisidiidae	0	0	1	0
Arrenurus	0	0	0	2
Sperchon	0	1	0	0
Sperchonopsis	0	1	0	0
Lebertia	0	2	0	0
Neumania	0	0	0	1
Hydrachna	0	0	0	1
Hydrodroma	1	8	2	6
Mideopsis	1	0	0	3
Krendowskia	0	2	0	1
Acariformes	1	0	0	0
Caecidotea	0	72	0	1
Hyalella azteca	0	1	0	11
Cambaridae	0	0	0	1
Stenonema integrum integrum	0	0	1	0
Pseudocloeon	0	1	0	0
Centroptilum	0	1	0	0
Callibaetis	0	1	0	0
Isonychia	0	0	1	0
Tricorythodes albilineatus	2	2	0	1
Argia	1	0	0	0

Appendix Table 8.1. Macroinvertebrate taxa from Stream Condition Index samples, January 15, 2001

Scientific Name	Control 100 SCI	Test 110 SCI	Control 30 SCI	Test 10 SCI
Stenelmis	4	3	5	2
Dubiraphia vittata	0	1	0	0
Microcylloepus pusillus	0	21	0	0
Climacea	0	1	0	0
Cheumatopsyche	0	1	0	0
Hydropsyche	0	0	1	0
Hydroptila	17	50	10	6
Oxyethira	0	0	0	1
Oecetis persimilis	0	4	1	0
Oecetis georgia	2	0	0	0
Ceratopogonidae	0	0	1	3
Atrichopogon	0	1	0	0
Dasyhelea	0	1	0	0
Chironomidae	0	2	0	0
Ablabesmyia mallochi	6	0	0	33
Pentaneura inconspicua	1	0	0	0
Corynoneura	1	0	0	0
Cricotopus bicinctus	0	1	0	3
Parakiefferiella	0	0	4	0
Tvetenia vitracies	0	0	2	0
Cryptochironomus	0	0	0	3
Dicrotendipes modestus	0	0	1	0
Dicrotendipes neomodestus	16	17	26	293
Polypedilum convictum	0	2	1	0
Polypedilum scalaenum grp.	1	0	5	6
Polypedilum halterale grp.	0	0	7	0
Stenochironomus	1	0	0	0
Xestochironomus	0	0	2	0
Pseudochironomus	4	2	9	0
Paratanytarsus	1	0	0	0
Rheotanytarsus pellucidus	1	16	3	0
Rheotanytarsus exiguus grp.	0	3	1	0
Stempellina	2	0	2	3
Tanytarsus sp. a epler	0	0	0	5
Tanytarsus sp. c epler	13	8	12	10
Hemerodromia	1	1	2	0

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		1/15/02	Suwannee River

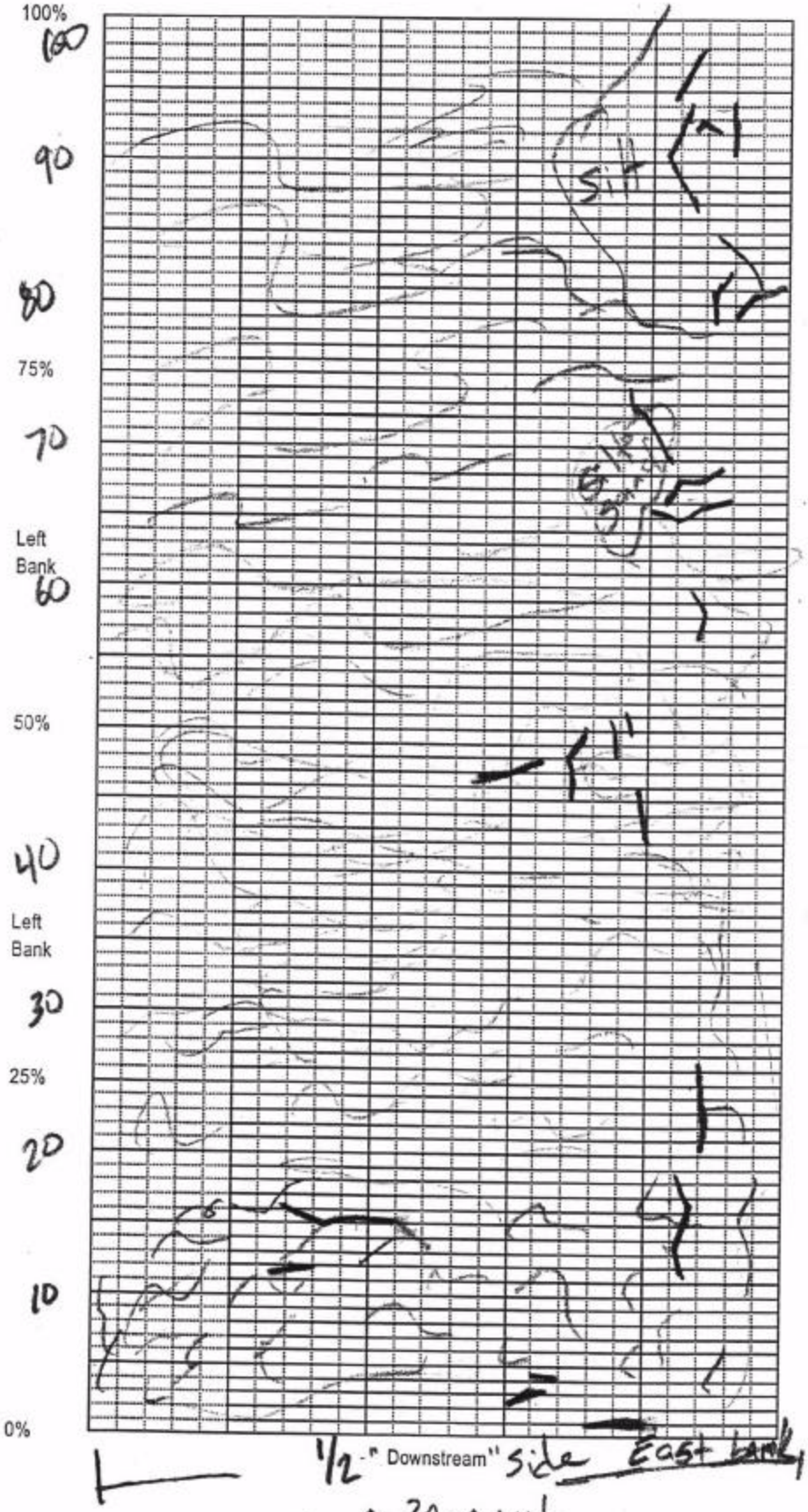
REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Control 30 [East Bank]

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components				
Substrate Diversity [8]	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 1 8 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 [20]	Greater than 30% productive habitat present at site. (20) 19 1 8 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 [15]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 1 8 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec (15) 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering [18]	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent
Primary Score [61]	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Secondary Habitat Components				
Artificial Channelization [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 1 8 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank [10] Left Bank [10]	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) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system (5) 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank [10] Left Bank [10]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. (10) (9)	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score [80]				

TOTAL SCORE [146]

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/15/02	Jay Jackson	Jay Jackson

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

Gold Kist FYI - Control 30
[East Bank]

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 1/15/02	RECEIVING BODY OF WATER: Suwannee River

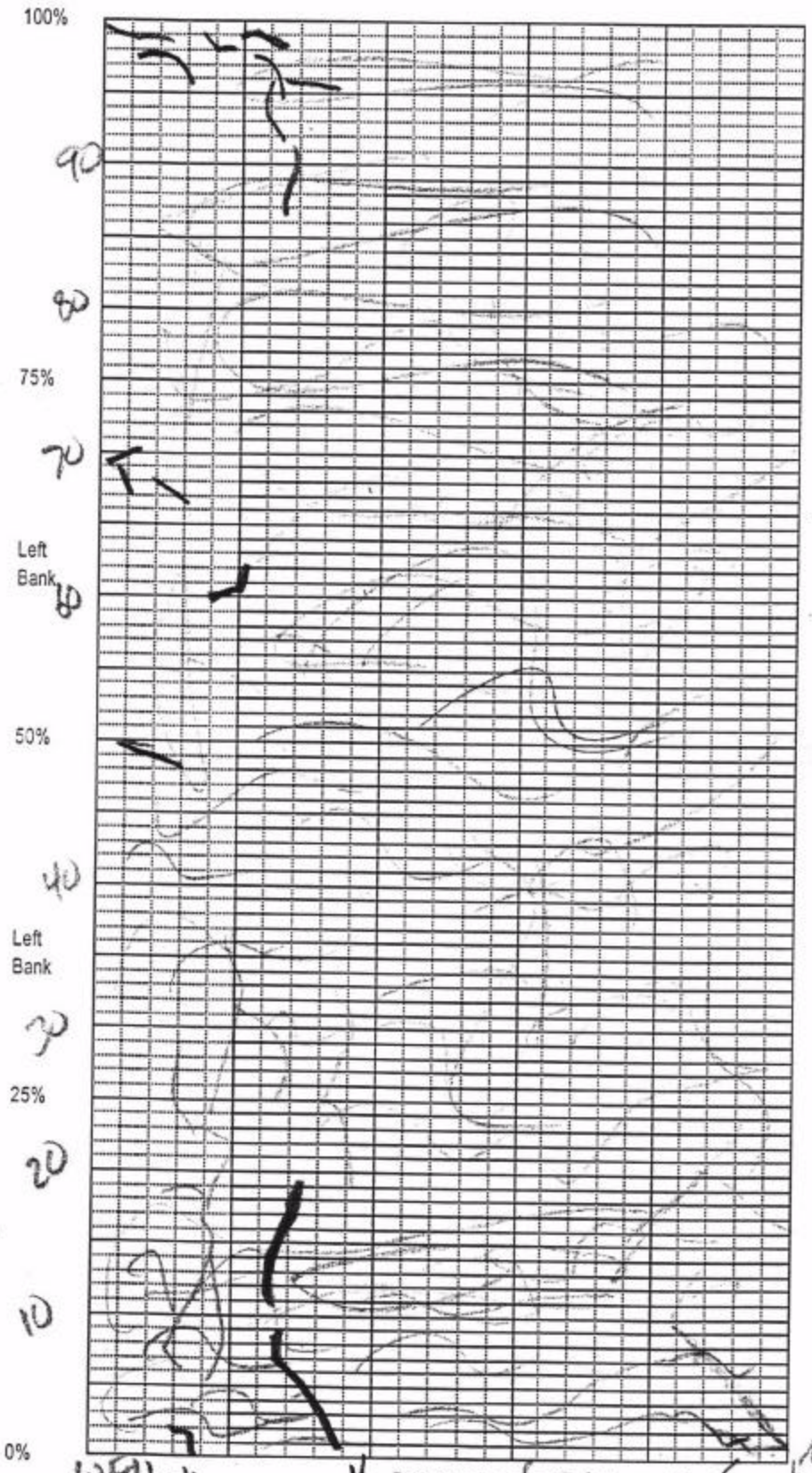
REMARKS:	COUNTY:	LOCATION: Gold Kist. FYI	FIELD ID/NAME: Control 100 [West Bank]

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** [9]	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 (9) 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability [20]	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 [15]	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 [20]	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent
Primary Score [64]	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	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	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank [10] Left Bank [10]	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) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank [10] Left Bank [10]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score [80]				

[144] **TOTAL SCORE**

ANALYSIS DATE: 1/15/02	ANALYST: Jay Jackson	SIGNATURE: Jay Jackson

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

Gold Kist FYI - Control 100 - West Bank

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		1/15/02	Suwannee River

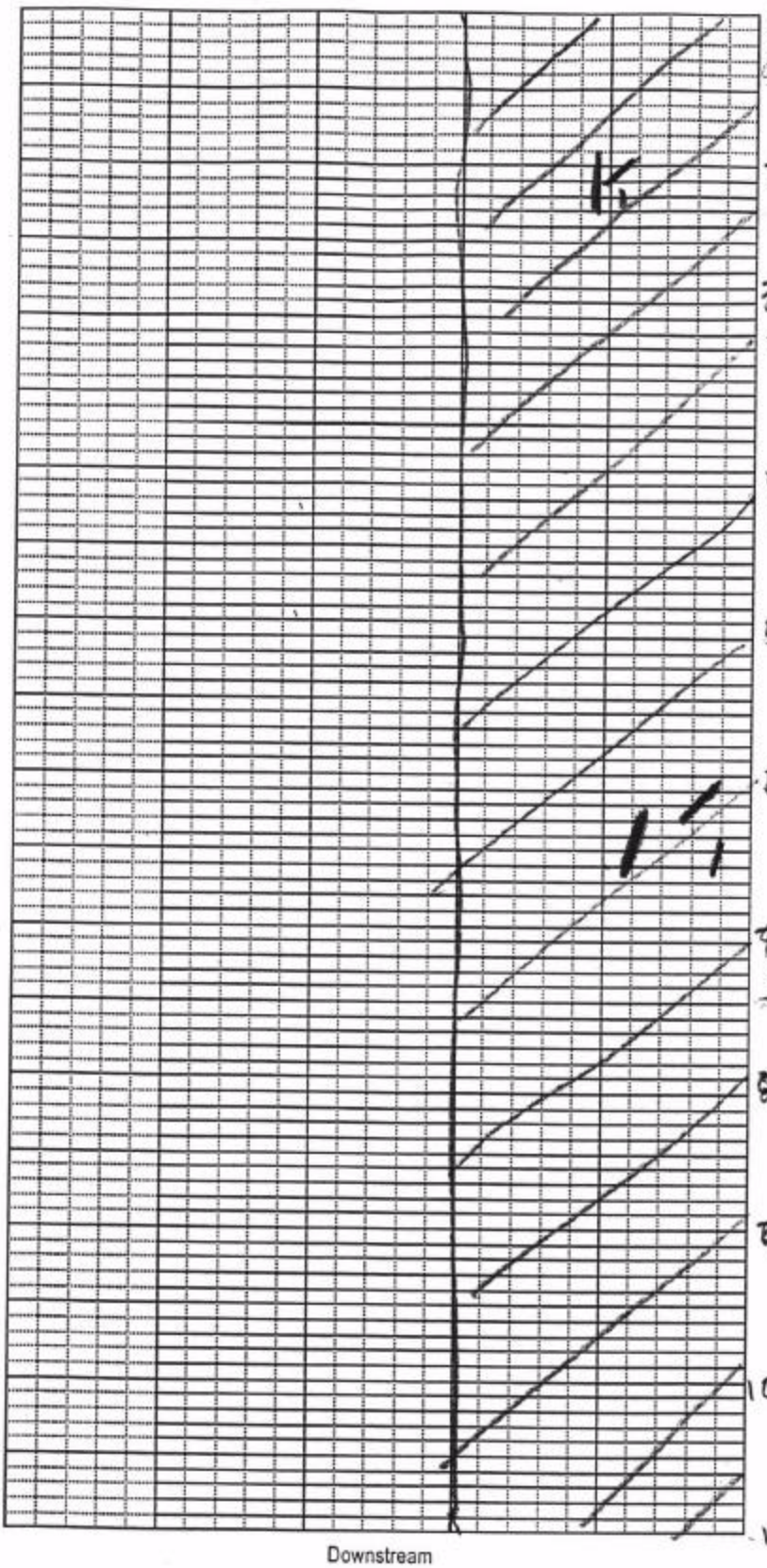
REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist FYI	Test 10

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** [7]	Four or more productive habitats present (snags tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 (7) 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability [20]	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 [13]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 (13) 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering [18]	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent
Primary Score [58]	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	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	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank [10] Left Bank [10]	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) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank [10] Left Bank [10]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score [80]				

[138] TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/15/02	Jay Jackson	Jay Jackson

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

Cold Kict FYI - Test 10

(USE W| TEST 6A PHIS /CHEM)

* only mapped + sampled out to ± 10 m from bank

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		1/15/02	Suwannee River

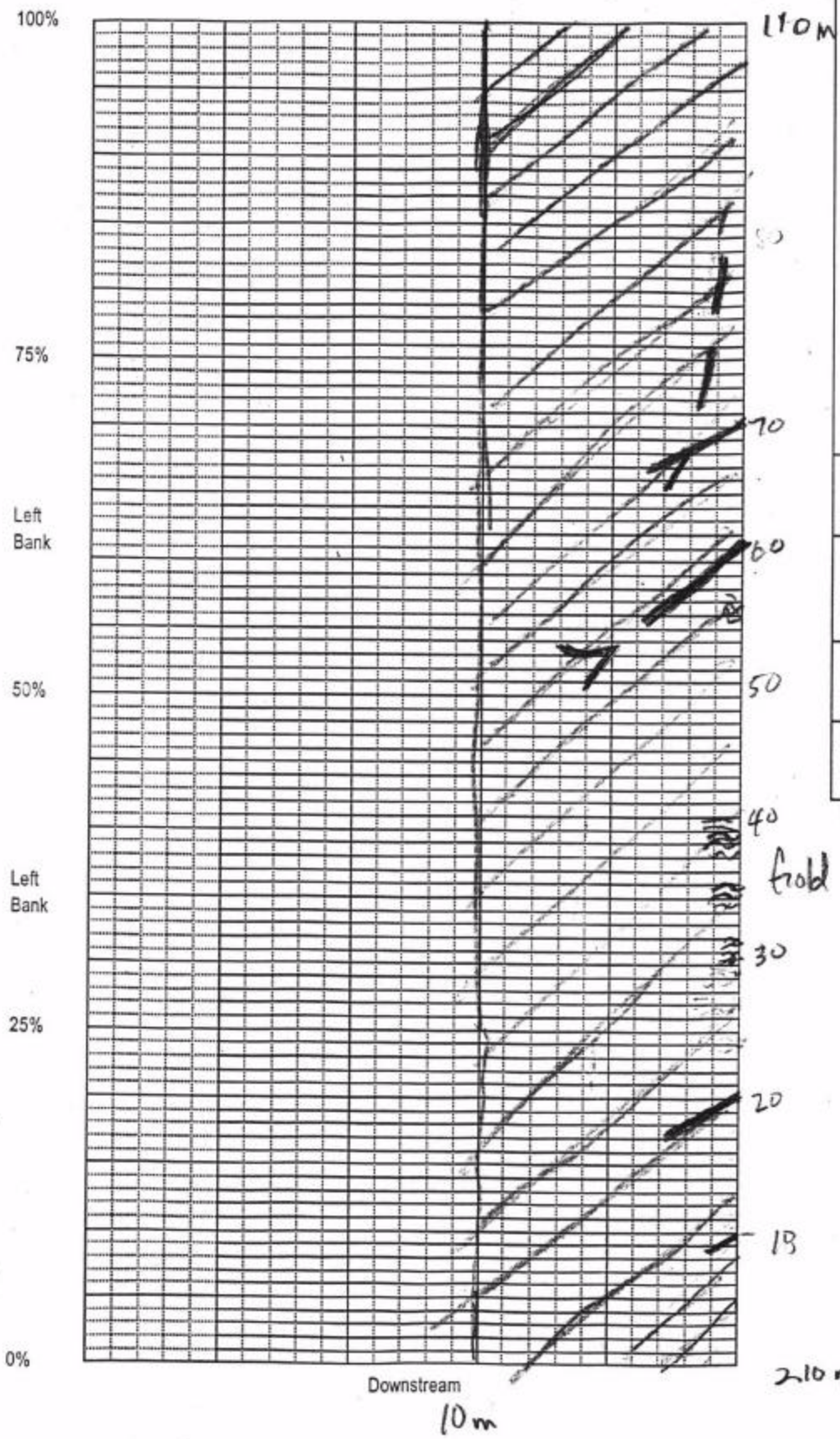
REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		Gold Kist F41	Test 110

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components				
Substrate Diversity 17	Four or more productive habitats present (snags tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 (14) 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 20	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 14	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 20	Less than 20% of habitats affected by sand or silt accumulation (20) 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Primary Score 68				
Secondary Habitat Components				
Artificial Channelization 20	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 10 / Left Bank 10	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) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 / Left Bank 10	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score 80				

148 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/15/02	Jay Jackson	Jay Jackson

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

Frobd Kist Fyl - Toot 110

Appendix 9. Quantitative macro-invertebrate data: Hester-Dendy multi-plate samplers

Appendix Table 9.1 Results From Hester-Dendy multi-plate samplers: January 2002. Values are the sum of results from three Hester-Dendy blocks.

	Control (upstream)				Test (downstream)				
Scientific Name	GLDKST100A	GLDKST100B	GLDKST30A	GLDKST30B	GLDKST6B	GLDKST6A	GLDKST3A	GLDKST3B	GLDKST1A
Hydra	1	0	0	0	0	0	0	0	0
Enchytraeidae	1	0	0	0	0	0	0	0	0
Limnodrilus hoffmeisteri	0	0	1	0	0	0	0	0	0
Slavina appendiculata	0	0	0	0	0	0	1	0	0
Stylaria lacustris	0	0	0	0	2	3	0	0	0
Nais(animal)	0	0	0	0	0	1	0	0	0
Nais communis complex	1	0	2	20	0	0	0	0	0
Viviparus georgianus	0	0	0	0	0	0	1	0	1
Amnicola	0	1	0	0	0	2	0	0	0
Amnicola dalli	0	0	0	0	0	0	0	0	3
Pseudosuccinea columella	0	1	0	0	0	0	0	0	0
Ancylidae	0	5	2	0	0	5	1	0	1
Ferrissia	2	0	0	1	0	0	0	1	0
Planorbidae	0	1	0	0	0	0	0	0	0
Micromenetus dilatatus	0	0	0	0	0	0	1	1	0
Physella	1	8	0	0	288	180	8	15	2
Sperchon	0	0	1	0	0	0	0	0	0
Lebertia	0	1	3	0	0	0	0	0	0
Hydrodroma	0	8	0	0	1	8	1	1	0
Atractides	0	0	1	2	1	0	0	0	1
Hygrobates	0	0	0	3	0	0	0	0	1
Hyalella azteca	0	0	0	1	4	8	2	2	1
Stenonema	1	0	0	0	0	0	0	0	0
Stenonema exiguum	0	10	13	8	8	3	2	0	13
Stenonema smithae	0	0	0	8	0	0	0	0	0
Stenacron	0	0	0	0	0	0	3	0	0
Stenacron interpunctatum	2	0	0	0	0	0	0	0	0
Pseudocloeon	0	1	0	0	1	0	1	0	0
Centroptilum	0	2	0	0	0	9	0	0	0

Appendix Table 9.1 Results From Hester-Dendy multi-plate samplers: January 2002. Values are the sum of results from three Hester-Dendy blocks.

Continued,	Control (upstream)	Test (downstream)							
Scientific Name	GLDKST100A	GLDKST100B	GLDKST30A	GLDKST30B	GLDKST6B	GLDKST6A	GLDKST3A	GLDKST3B	GLDKST1A
Callibaetis	0	0	0	0	0	1	0	0	0
Isonychia	0	3	1	0	0	0	0	0	0
Tricorythodes albilineatus	7	8	5	3	2	5	4	3	7
Caenis	0	1	1	0	0	0	0	0	0
Argia	1	1	0	0	0	0	0	0	0
Argia tibialis	0	0	0	0	0	0	0	1	0
Taeniopteryx	0	1	2	0	0	0	0	0	1
Attaneuria ruralis	0	0	0	0	0	0	0	0	1
Agnetina annulipes	0	0	1	0	0	0	0	0	0
Dineutus	0	3	3	0	1	0	0	0	0
Elmidae	0	0	0	0	0	1	0	0	0
Stenelmis	1	0	4	2	0	0	0	0	1
Chimarra	0	13	64	46	3	1	0	0	1
Cheumatopsyche	0	10	149	40	36	7	0	0	5
Hydropsyche	0	66	226	184	26	2	0	1	2
Hydroptila	139	803	741	633	263	138	0	2	132
Oxyethira	35	4	1	0	6	6	1	0	2
Neotrichia	8	4	0	1	1	8	2	0	7
Oecetis avara	0	0	0	0	1	0	0	0	0
Oecetis persimilis	4	15	9	7	12	12	3	2	3
Oecetis georgia	4	0	0	0	0	0	0	2	0
Nectopsyche exquisita	0	22	0	0	0	0	0	0	1
Ceraclea transversus	0	0	0	0	0	1	0	0	2
Neureclipsis	0	0	4	0	0	1	0	0	0
Neureclipsis crepuscularis	0	0	0	3	1	0	0	0	0
Simulium	0	1	1	0	0	0	0	1	0
Palpomyia/bezzia grp.	2	0	0	0	0	0	0	0	0
Ablabesmyia mallochi	81	73	36	21	16	44	7	17	9
Ablabesmyia rhamphe grp.	0	0	0	0	0	0	0	1	0

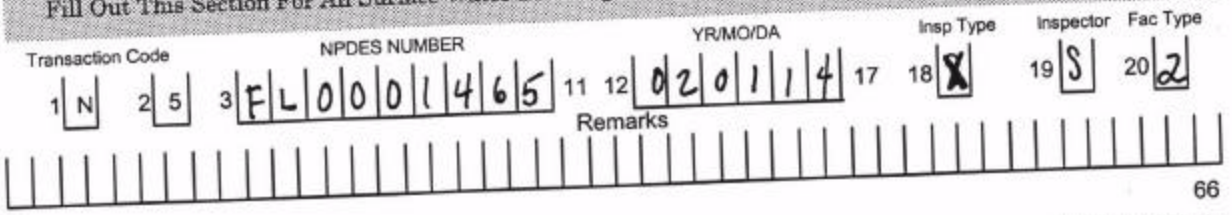
Appendix Table 9.1 Results From Hester-Dendy multi-plate samplers: January 2002. Values are the sum of results from three Hester-Dendy blocks.

Continued,	Control (upstream)	Test (downstream)							
Scientific Name	GLDKST100A	GLDKST100B	GLDKST30A	GLDKST30B	GLDKST6B	GLDKST6A	GLDKST3A	GLDKST3B	GLDKST1A
Labrundinia	0	0	0	0	0	0	0	1	0
Labrundinia pilosella	0	0	0	0	0	4	0	0	0
Pentaneura inconspicua	28	83	71	48	7	13	0	1	22
Rheopelopia	0	0	36	76	13	4	0	0	12
Potthastia longimana	6	0	0	9	0	0	0	0	0
Thienemannimyia grp.	0	0	12	14	3	0	0	0	0
Corynoneura	0	0	0	0	0	0	0	1	0
Corynoneura lobata	0	4	0	0	0	0	0	0	0
Corynoneura sp. b epler	18	0	17	32	9	20	0	0	20
Cricotopus bicinctus	0	25	41	39	6	4	0	0	0
Nanocladius	12	0	11	6	3	3	2	2	3
Parakiefferiella	38	10	23	73	23	65	0	9	23
Thienemanniella	0	0	0	38	11	10	0	0	0
Thienemanniella xena	0	0	6	0	0	0	0	0	0
Thienemanniella sp. b epler	0	0	6	0	0	0	0	0	3
Tvetenia vitracies	0	92	283	307	8	3	0	0	3
Dicrotendipes neomodestus	529	272	192	243	283	407	21	17	29
Phaenopsectra obediens	4	0	0	0	0	0	1	0	0
Polypedilum convictum	4	6	43	19	10	12	0	0	8
Polypedilum fallax	4	0	0	0	0	0	0	0	0
Polypedilum scalaenum grp.	0	3	0	0	0	0	3	0	1
Polypedilum illinoense grp.	1	0	0	6	0	0	0	0	0
Polypedilum halterale grp.	3	0	0	32	1	0	0	0	0
Pseudochironomus	4	4	15	25	0	0	0	0	3
Cladotanytarsus	1	0	0	0	0	0	0	0	0
Paratanytarsus	0	0	0	0	2	0	0	0	0
Rheotanytarsus pellucidus	52	568	653	269	19	10	1	3	106
Rheotanytarsus exiguus grp.	10	39	104	75	21	6	0	0	22
Stempellina	3	2	0	6	0	0	1	0	0

Appendix Table 9.1 Results From Hester-Dendy multi-plate samplers: January 2002. Values are the sum of results from three Hester-Dendy blocks.

Continued,	Control (upstream)	Test (downstream)							
Scientific Name	GLDKST100A	GLDKST100B	GLDKST30A	GLDKST30B	GLDKST6B	GLDKST6A	GLDKST3A	GLDKST3B	GLDKST1A
Tanytarsus sp. l epler	0	5	0	0	0	3	0	0	0
Tanytarsus sp. a epler	74	92	34	4	12	45	35	62	17
Tanytarsus sp. s epler	0	0	0	0	0	3	0	0	5
Tanytarsus sp. c epler	142	93	87	139	54	130	18	20	63
Hemerodromia	2	38	37	50	16	16	1	0	8

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



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

