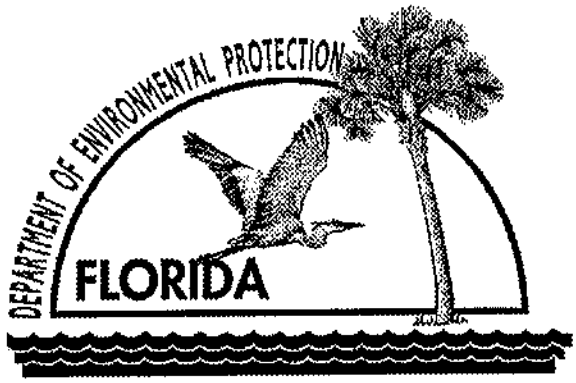



Biological Assessment of

# Gold Kist Inc. - Poultry Division

Suwannee County

NPDES #FL0001465

Sampled April 1995

August 1995

**Biology Section**
**Division of Administrative and Technical Services**

Comprehensive Quality Assurance Plan No. 870346G

# Department of Environmental Protection
## Results of Fifth Year Inspections

Discharger: Gold Kist Inc. - Poultry Division
County: Suwannee
NPDES Number: FL0001465
State Permit Expiration Date: 16 July 1996

### Toxics Sampling Inspection (XSI)

Date Sampled: 24 April 1995

Results: No organic pollutants or metals were detected in the effluent at levels exceeding Class III water quality standards.

### Compliance Biomonitoring Inspection (CBI)

Date Sampled: 24 April 1995

Results: The sample of effluent was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the bannerfin shiner, *Cyprinella leedsi*.

### Impact Bioassessment Inspection (IBI)

Date Sampled: 24 April 1995

Results: Both the Hester-Dendy and dip net data indicated that the facility was not adversely affecting the receiving waters. Taxa richness, the Florida Index, and the EPT Index were relatively similar between the reference and test sites, with the dip net scores being substantially higher than those calculated from the Hester-Dendys. The Stream Invertebrate Index for Florida scores (27 at the reference site, 23 at the test site) indicated that both sites were in the unimpaired range. Although diversity was decreased at the test site, it was within water quality standards. The phytoplankton data suggested that the discharge was not exerting any appreciable negative effects in the Suwannee River. The phytoplankton taxa richness, Shannon-Weaver Diversity Index, and chlorophyll *a* indicated moderate improvements from the reference to test site.

### Water Quality Inspection (WQI)

Date Sampled: 24 April 1995

Results: The effluent total residual chlorine exceeded the facility's permit limits. Fecal and total coliforms complied with Class III water quality standards in the effluent, reference site, and test site samples. The Gold Kist facility had a negligible effect on the nutrient levels of the receiving waters, which already exhibited signs of nitrate-nitrite and phosphorus enrichment. Although the effluent had elevated concentrations of ammonia (6.4 mg/L), nitrate-nitrite (17 mg/L) and TKN (8.5 mg/L), it did not appear to significantly increase the test site levels. The high nutrient concentrations at the reference site can possibly be attributed to other sources upstream from the facility (*e.g.*, dairies, springs, and other point source discharges). Algal growth potential results at the reference and test sites were identical (at 22.5 mg dry wt/L), both exceeding the 5 mg dry wt/L "problem threshold". The effluent AGP was 77.8 mg dry wt/L. These data suggest that even though the bioavailable nutrients were quite high in the effluent, the river, at its current stream flow, was able to adequately assimilate them via dilution. However, during extremely low flow conditions, this nutrient loading may present a problem.

## Introduction

Gold Kist, Inc. - Poultry Division is a poultry processing plant and rendering facility located in Suwannee County on Highway 90, south of the Suwannee River State Park, Florida (see maps in Appendix). Wastewater treatment at this 1.04 MGD facility consists of dissolved air floatation, trickling filtration, extended aeration in an activated sludge reactor, and subsequent clarification. This wastewater then receives tertiary treatment, consisting of nutrient removal in a stabilization pond and sand filtration. The effluent is chlorinated for disinfection, and then dechlorinated, before it flows through a pipeline into the Suwannee River, an Outstanding Florida Waterbody. The plant has been operating at 0.819 MGD, which is approximately 80% of its capacity.

State permit limits are as follows: $BOD_5$ (24.3 mg/L as a daily maximum, 18 mg/L as a monthly average, and 15 mg/L as an annual average), TSS (46.2 mg/L as a daily maximum, 25.5 mg/L as a monthly average, and 20 mg/L as an annual average), TKN (15.0 mg/L as a daily maximum, 10.0 mg/L as a monthly average), total residual chlorine (0.01 mg/L as a daily maximum), oil and grease (5 mg/L as both a monthly and an annual average), pH (6.0 to 8.5 SU's), fecal coliforms (200 organisms/100 mL as a daily maximum), and unionized ammonia (0.02 mg/L as a daily maximum).

TSS and fecal coliforms exceeded permit limits in November, 1994, due to a treatment plant upset. Construction of the tertiary treatment system to control nutrient levels began in October, 1993. Also at that time, a spray field was acquired for applying digested sludge. A review of Gold Kist's monitoring data shows that they have improved the quality of their effluent. Unionized ammonia, TKN, and fecal coliform values reported from

*Major characteristics of invertebrate community structure of control and test sites.*

| | Reference Site | Test Site |
|---|---|---|
| **Macroinvertebrate Qualitative** | | |
| Number of Taxa | 45 | 31 |
| Florida Index | 19 | 17 |
| SIIF | 27 | 23 |
| EPT Index | 8 | 6 |
| % Contribution of Dominant Taxon | 18.4 | 17.4 |
| % Isopoda | 10.1 | 7.4 |
| % Diptera | 44.3 | 49.6 |
| % Ephemeroptera | 3.2 | 5.8 |
| % Trichoptera | 10.8 | 13.2 |
| % Gastropoda | 5.1 | 2.5 |
| % Coleoptera | 12.0 | 12.4 |
| % Pelecypoda | 3.8 | 3.3 |
| % Other Taxa | 10.7 | 5.8 |
| % Predators | 11.4 | 6.6 |
| % Above Surface Deposit Feeders | 12.7 | 13.2 |
| % Below Surface Deposit Feeders | 0 | 0.8 |
| % Suspension Feeders | 24.7 | 42.6 |
| % Scrapers | 11.7 | 14.1 |
| % Shredders | 4.1 | 0.1 |
| % Other Feeding Groups | 35.4 | 22.6 |
| **Macroinvertebrate Hester-Dendy** | | |
| Number of Taxa | 18 | 26 |
| Florida Index | 9 | 11 |
| Shannon-Weaver Diversity | 3.7 | 2.9 |
| EPT Index | 4 | 4 |
| %Pelecypoda | 2.0 | 0 |
| % Diptera | 50.0 | 89.1 |
| % Ephemeroptera | 26.0 | 6.6 |
| % Trichoptera | 4.0 | 0 |
| % Gastropoda | 2.0 | 0 |
| % Coleoptera | 2.0 | 1.6 |
| % Other Taxa | 14.0 | 2.7 |
| % Predators | 14.0 | 14.6 |
| % Above Surface Deposit Feeders | 14.0 | 7.4 |
| % Below Surface Deposit Feeders | 0 | 1.3 |
| % Suspension Feeders | 16.0 | 59.7 |
| % Scrapers | 15.0 | 3.8 |
| % Shredders | 1.0 | 0 |
| % Other Feeding Groups | 40.0 | 13.2 |

*Major characteristics of algal community structure of control and test sites.*

| | Reference Site | Test Site |
|---|---|---|
| **Phytoplankton Algae** | | |
| Number of Taxa | 8 | 10 |
| Shannon-Weaver Diversity | 2.9 | 3.2 |
| Algal Density (#/mL) | 113.0 | 143.8 |
| Chlorophyll a (µg/L) | .56 | .39 U |
| % Blue-green | 36.4 | 35.7 |
| % Green | 9.1 | 35.7 |
| % Diatoms | 54.5 | 21.4 |
| % Euglenophytes | 0 | 7.1 |
| **Algal Growth Potential (mg dry wt/l)** | 22.5 | 22.5 |

1992 to the present have decreased significantly due to the addition of the tertiary treatment system.

## Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (approximately 100 meters upstream of the discharge) and a test site (approximately 100 meters downstream from the discharge). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays using the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, as test organisms were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton racks were placed at the reference and test sites, but the water level dropped drastically and the slides were dry when retrieved. Therefore, phytoplankton communities were analyzed for chlorophyll *a* and algal identification (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

### Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of a discharge. These are briefly discussed here.

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. Species sensitivity data from other sources, such as Hulbert (1990), Hudson *et*

*al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), are used as appropriate.

Ephemeroptera/Plecoptera/Trichoptera Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.

Community structure: Substantial shifts in proportions of major groups of organisms, compared to reference conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

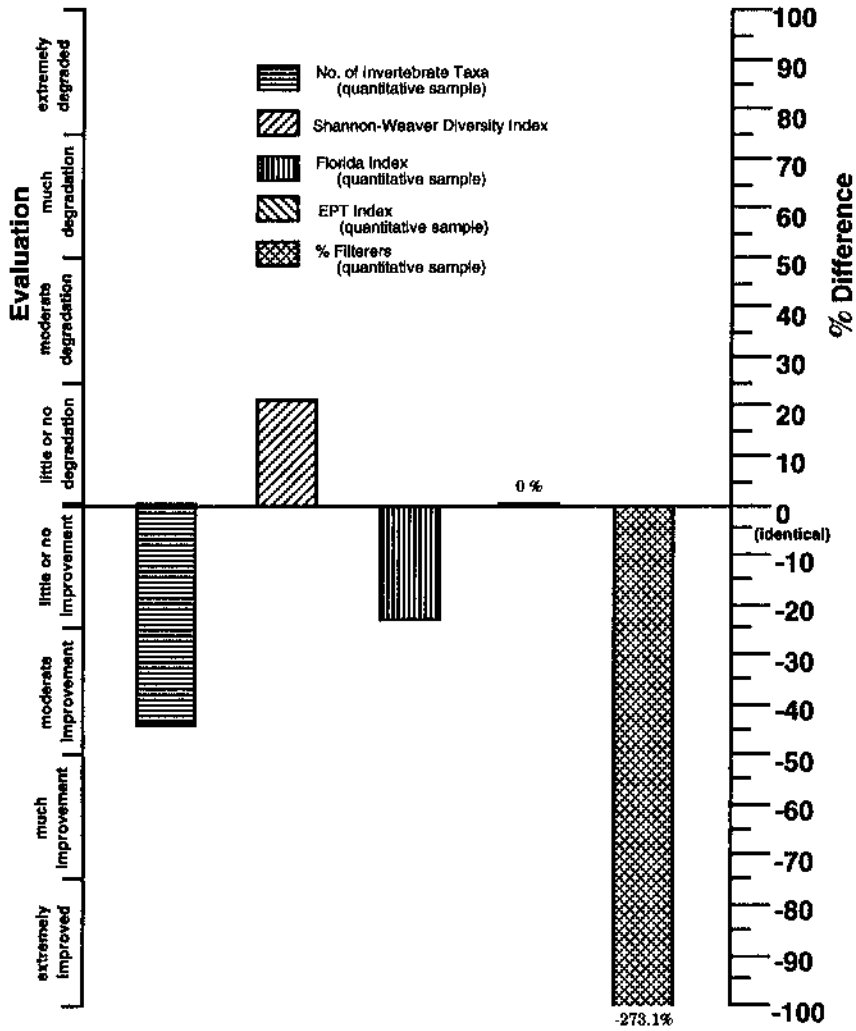
Algal biomass: High algal biomass (algal density or chlorophyll *a* implies nutrient stress. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

Trophic composition/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream Invertebrate Index for Florida (SIIF) is a composite macroinvertebrate metric (EA Engineering 1994). The SIIF assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SIIF calculation table in Appendix).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, the diatom to blue-green algae ratio, and the % filter-feeders are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Tim McKelvey and Ruth Bouman (DEP Northeast District) and Lyn Burton, Michael Corrigan, Marshall Faircloth, Russel Frydenborg, Maosen Hua, Christy LeDuc, Kathleen Lurding, Tina Mikulski, Ed Miller, Elizabeth Miller, Joe North, Urania Quintana, Tobin Rader, Bart Richard, Landon Ross, Jennifer Sparapani, Lisa Tamburello, Lori Wenkert, David Whiting, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.




***Effect of discharge on the benthic macroinvertebrate community.***

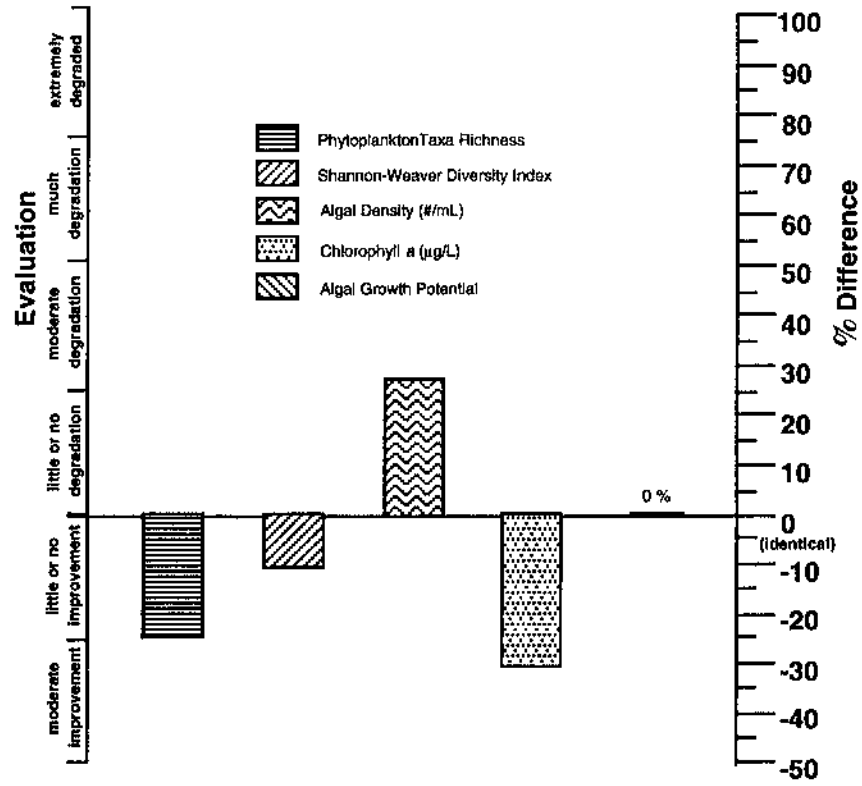
## Results and Discussion

Habitat quality ratings at the two Suwannee River study sites were virtually identical, with 127 points and 126 points assigned to the reference and test sites, respectively. The instream substrates sampled at both stations included snags, rock rubble, and limestone undercut banks. Leaf packs were an additional substrate found at the reference site. Dissolved oxygen at the reference site (4.5 mg/L) and the test site (4.8 mg/L) were both below Class III Water Quality Standards. The facility's effluent did not appear to contribute to this problem. The pH was slightly above neutral at both sites (7.3 S.U.'s at the reference site and 7.2 S.U.'s at the test site). The conductivities at the reference site (211 µmhos/cm) and the test site (215 µmhos/cm) were also similar.

The sample of effluent was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the bannerfin shiner, *Cyprinella leedsi*. No mortality occurred in the chlorinated or the dechlorinated water sample during the two 48 hour acute bioassays (Appendix), however, the effluent total residual chlorine (0.1 mg/L) exceeded the facility's permit limits.

No organic pollutants were detected in the effluent. Of the metals analyzed for, only iron (70 µg/L), nickel (15 µg/L), and zinc (16 µg/L) were found. None of these metals are above Class III water quality standards.

Fecal coliform bacteria were measured to be 20 organisms/100 mL at the reference site, less than 20 organisms/100 mL at the test site, and less than 20 organisms/100 mL in the effluent. Total coliforms were 500 organisms/100 mL at the reference site, 220 organisms/100 mL at the test site, and 230 organisms/100 mL in the effluent. All of these values were within Class III water quality standards.




***Effect of discharge on the algal community.***

The Gold Kist facility had a negligible effect on the nutrient levels of the Suwannee River test site. The nitrate-nitrite concentration was higher than 80%-85% of typical Florida streams at both the reference (0.38 mg/L) and the test site (0.40 mg/L). Total phosphorus was higher than approximately 55% of typical Florida streams at both stations, with 0.16 mg/L at the reference site and 0.15 mg/L at the test site. Although the effluent had elevated concentrations of ammonia (6.4 mg/L), nitrate-nitrite (17 mg/L) and TKN (8.5 mg/L), it did not appear to significantly increase the test site levels. The high nutrient levels at the reference site can possibly be attributed to other sources upstream from the facility (*e.g.*, dairies, springs, and other point source discharges).

Algal growth potential (AGP) values at the reference and test sites were identical (at 22.5 mg dry wt/L), both exceeding the 5 mg dry wt/L "problem threshold" (Raschke and Schultz, 1987). The effluent AGP was 77.8 mg dry wt/L. These data suggest that even though the bioavailable nutrients were quite high in the effluent, the river, at its current stream flow, was able to adequately assimilate them via dilution. However, during extremely low flow conditions, this nutrient loading may present a problem.

The figure on p. 3 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger dif-

ferences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference.

The Hester-Dendy data indicate that the facility was not adversely affecting the receiving waters. Taxa richness (18 at the reference site and 26 at the test site) and the Florida Index (9 at the reference site and 11 at the test site) indicated slight improvement downstream of the discharge. The Shannon-Weaver Diversity Index decreased by 21.6% from the reference site to the test site, but this was within water quality standards. The Ephemeroptera/Plecoptera/Trichoptera Index was identical (4) at both sites. The percent filter feeders increased at the test site, another sign of improvement. Taxa sensitive to pollution, such as *Rheotanytarsus exiguus* group and *Stenonema exiguum,* were abundant at both sites.

Dip net sampling was confounded by several factors, including extreme river depth, recent water level fluctuations, and difficulty in reaching inhabited substrates (accessible only on the shoreline). Nevertheless, qualitative sampling indicated that both sites were well represented by pollution sensitive taxa. Taxa richness, the Florida Index, and the EPT Index were relatively similar between the reference and test sites, with the dip net scores being substantially higher than those calculated from the Hester-Dendys. The Stream Invertebrate Index for Florida scores (27 at the reference site, 23 at the test site) indicated that both sites were in the unimpaired range.

The figure on p. 4 represents changes in the phytoplankton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. Although periphyton is the preferred community for detecting water quality changes in flowing waters, only phytoplankton data were available (due to dry diatometers). The phytoplankton data indicated the discharge was not exerting any appreciable negative effects in the Suwannee River. The phytoplankton taxa richness, Shannon-Weaver Diversity Index, and chlorophyll *a* indicated slight improvements from the reference to test sites. Algal density was slightly higher at the test site, but the absolute value (143.8 algal cells/mL) was quite low.

## Conclusions

The sample of effluent was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the bannerfin shiner, *Cyprinella leedsi*. No mortality occurred in either the chlorinated or the dechlorinated water sample during the two 48 hour acute bioassays. However, the effluent total residual chlorine exceeded the facility's permit limits.

No organic pollutants were detected in the effluent. No metals were found above Class III water quality standards.

Fecal and total coliforms complied with Class III water quality standards in the effluent, reference site, and test site samples.

The Gold Kist facility had a negligible effect on the nutrient levels of the receiving waters, which already exhibited signs of nitrate-nitrite and phosphorus enrichment. Although the effluent had elevated concentrations of ammonia (6.4 mg/L), nitrate-nitrite (17 mg/L) and TKN (8.5 mg/L), it did not appear to significantly increase the test site levels. The high nutrient concentrations at the reference site can possibly be attributed to other sources upstream from the facility (*e.g.*, dairies, springs, and other point source discharges).

Algal growth potential (AGP) values at the reference and test sites were identical (at 22.5 mg dry wt/L), both exceeding the 5 mg dry wt/L "problem threshold". The effluent AGP was 77.8 mg dry wt/L. These data suggest that even though the bioavailable nutrients were quite high in the effluent, the river, at its current stream flow, was able to adequately assimilate them via dilution. However, during extremely low flow conditions, this nutrient loading may present a problem.

Both the Hester-Dendy and dip net data indicated that the facility was not adversely affecting the receiving waters. Taxa richness, the Florida Index, and the EPT Index were relatively similar between the reference and test sites, with the dip net scores being substantially higher than those calculated from the Hester-Dendys. The Stream Invertebrate Index for Florida scores (27 at the reference site, 23 at the test site) indicated that both sites were in the unimpaired range. Although diversity was decreased at the test site, it was within water quality standards.

Although periphyton is the preferred community for detecting water quality changes in flowing waters, only phytoplankton data

was available (due to dry diatometers). The phytoplankton data suggested that the discharge was not exerting any appreciable negative effects in the Suwannee River. The phytoplankton taxa richness, Shannon-Weaver Diversity Index, and chlorophyll *a* indicated moderate improvements from the reference to test sites. Algal density was increased at the test site, but the absolute value (143.8 algal cells/mL) was quite low.

## Literature Cited

American Public Health Assoc., American Water Works Assoc., and Water Pollution Control Federation. 1989. Standard Methods for the Examination of Water and Wastewater, 17th ed. New York, N.Y. 1268 p.

Chang, S., F. W. Steimle, R. N. Reid, S. A. Fromm, V. S. Zdanowicz, and R. A. Pikanowski. 1992. Association of benthic macrofauna with habitat types and quality in the New York Bight. Mar. Ecol. Prog. Ser. 89: 237-251.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Fla. Dept. Environ. Protection. Unpaginated.

Engle, V. D., J. K. Summers, and G. R. Gaston. 1994. A benthic index of environmental condition of Gulf of Mexico estuaries. Estuaries 17(2): 372-384.

Farrell, D. H. 1992. A community based metric for marine benthos. Fla. Dept. Environ. Reg. SW Dist. Office. unpublished rept. 15 p.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Prot. Biology Section, Tallahassee, Fla. 73 p.

Hudson, P. L., D. R. Lenat, B. A. Caldwell, and D. Smith. 1990. Chironomidae of the Southeastern United States: A checklist of species and notes on biology, distribution, and habitat. U. S. Fish Wildl. Serv., Fish. Wildl. Res. 7. 46 pp.

Hulbert, J. L. 1990. A proposed lake condition index for Florida. North Amer. Benth. Soc. 38th Ann. Mtg., Blacksburg, VA, 11 p.

Lenat, D. R. 1993. A biotic index for the southeastern United States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. J. N. Am. Benthol. Soc. 12(3): 270-290.

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

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

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

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

Whitmore, T. J. 1989. Florida diatom assemblages as indicators of trophic state and pH. Limnol. Oceanogr. 34(5): 882-895.

**Chemistry summary table for**

| Gold Kist Inc. | Effluent | Reference Site | Test Site |
|---|---|---|---|
| **Organic Constituents (ug/L)** | | | |
| | None Detected | | |
| **Metals (ug/L)** | | | |
| Aluminum | 100 U | | |
| Arsenic | 10 U | | |
| Cadmium | 0.1 U | | |
| Chromium | 10 U | | |
| Copper | 3 U | | |
| Iron | 70 | | |
| Lead | 10 U | | |
| Mercury | .10 U | | |
| Nickel | 15 | | |
| Selenium | 30 U | | |
| Silver | 0.05 U | | |
| Zinc | 16 I | | |
| **Nutrients (mg/L)** | | | |
| Ortho-phosphate | 0.073 A | 0.098 A | 0.091 Q |
| Total phosphorus | 0.15 A | 0.16 | 0.15 |
| Ammonia | 6.4 A | 0.024 I | 0.023 I |
| Unionized ammonia | 0.011 | | |
| Nitrate+Nitrite | 17 | 0.38 | 0.40 |
| Nitrate | 17 | 0.37 | 0.38 A |
| TKN | 8.5 A | 0.57 | 0.47 |
| **General Phys-Chem Parameters** | | | |
| Habitat Assessment | | 127 | 126 |
| D.O. (mg/L) | 5.8 | 4.5 | 4.8 |
| pH (SU's) | 6.4 | 7.3 | 7.2 |
| Conductivity (µmhos/cm) | 1186 | 211 | 215 |
| Temperature (°C) | 25.3 | 21.7 | 21.6 |
| Total Suspended Solids (mg/L) | 3 | 3 | 4 |
| Biological Oxygen Demand, 5 day (mg/L) | 8 | < 2 | < 2 |
| Turbidity (NTU's) | 0.9 | 1.7 | 1.6 |
| Total Residual Chlorine (mg/L) | 0.1 | | |
| Color (PCU's) | 10 | 200 | 150 |
| Hardness (mg CaCO3) | 413.2 | | |
| Algal Growth Potential (mg dry wt/L) | 77.8 | 22.5 | 22.5 |
| **Toxicity** | | | |
| Bioassay Fish-Chlorinated | Not Toxic | | |
| Bioassay Invertebrate-Chlorinated | Not Toxic | | |
| Bioassay Fish-Dechlorinated | Not Toxic | | |
| Bioassay Invertebrate-Dechlorinated | Not Toxic | | |
| **Microbiological Communities (org/100 mL)** | | | |
| Fecal coliform | < 20 | 20 | < 20 |
| Total coliform | 230 | 500 | 220 |

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

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

Q - Sample held beyond normal holding time

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

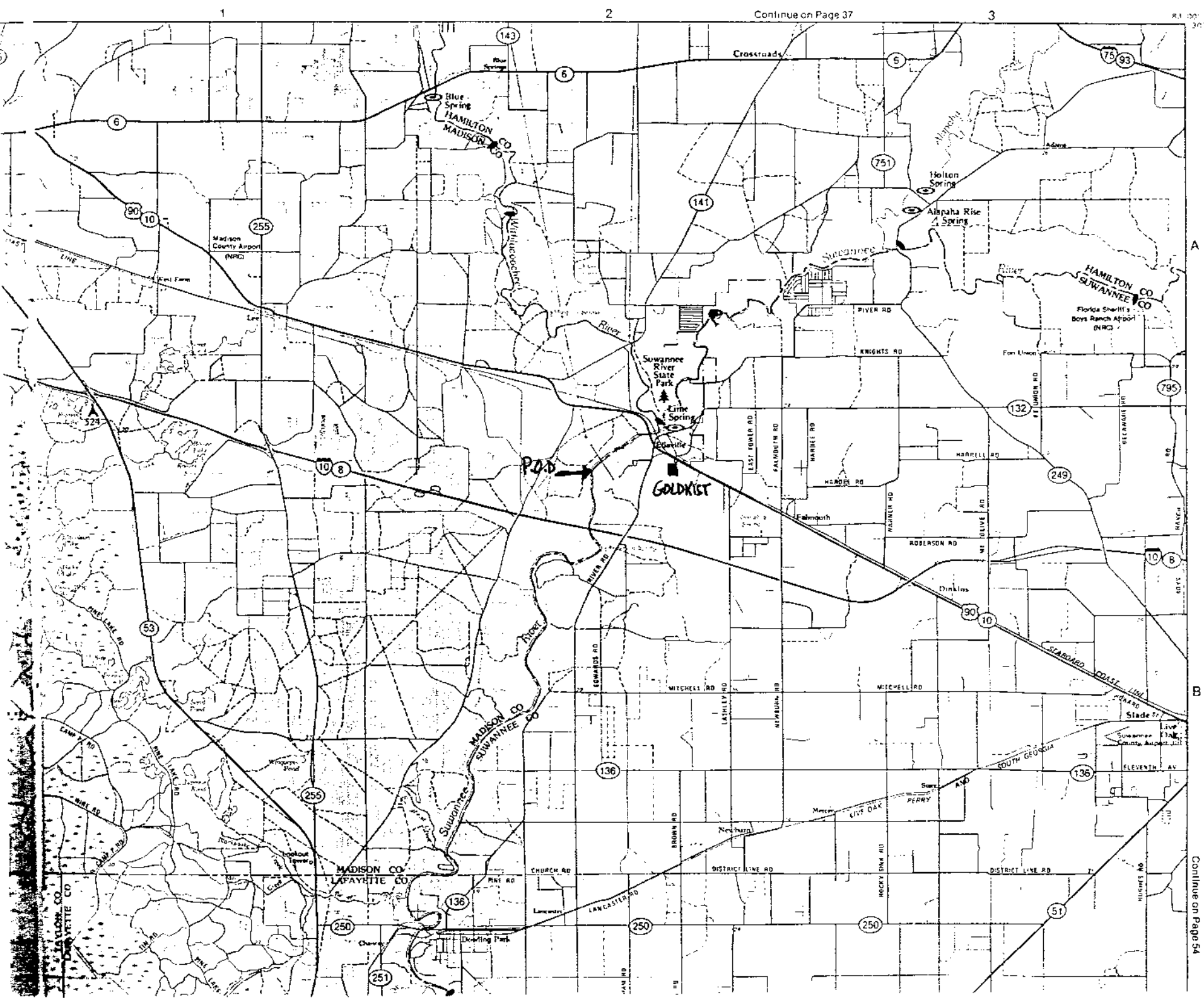
# Typical Values for Selected Parameters in Florida Waters

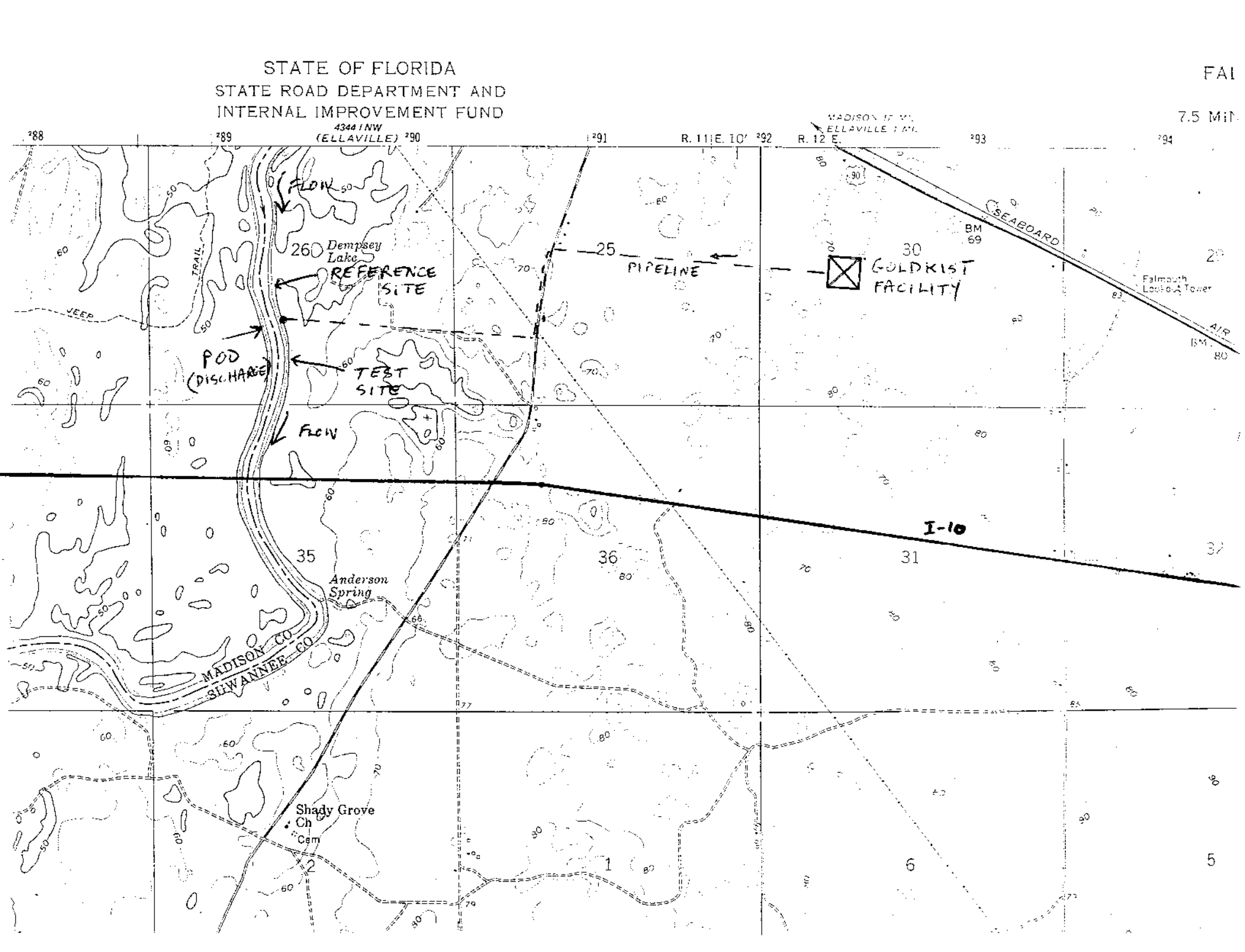
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

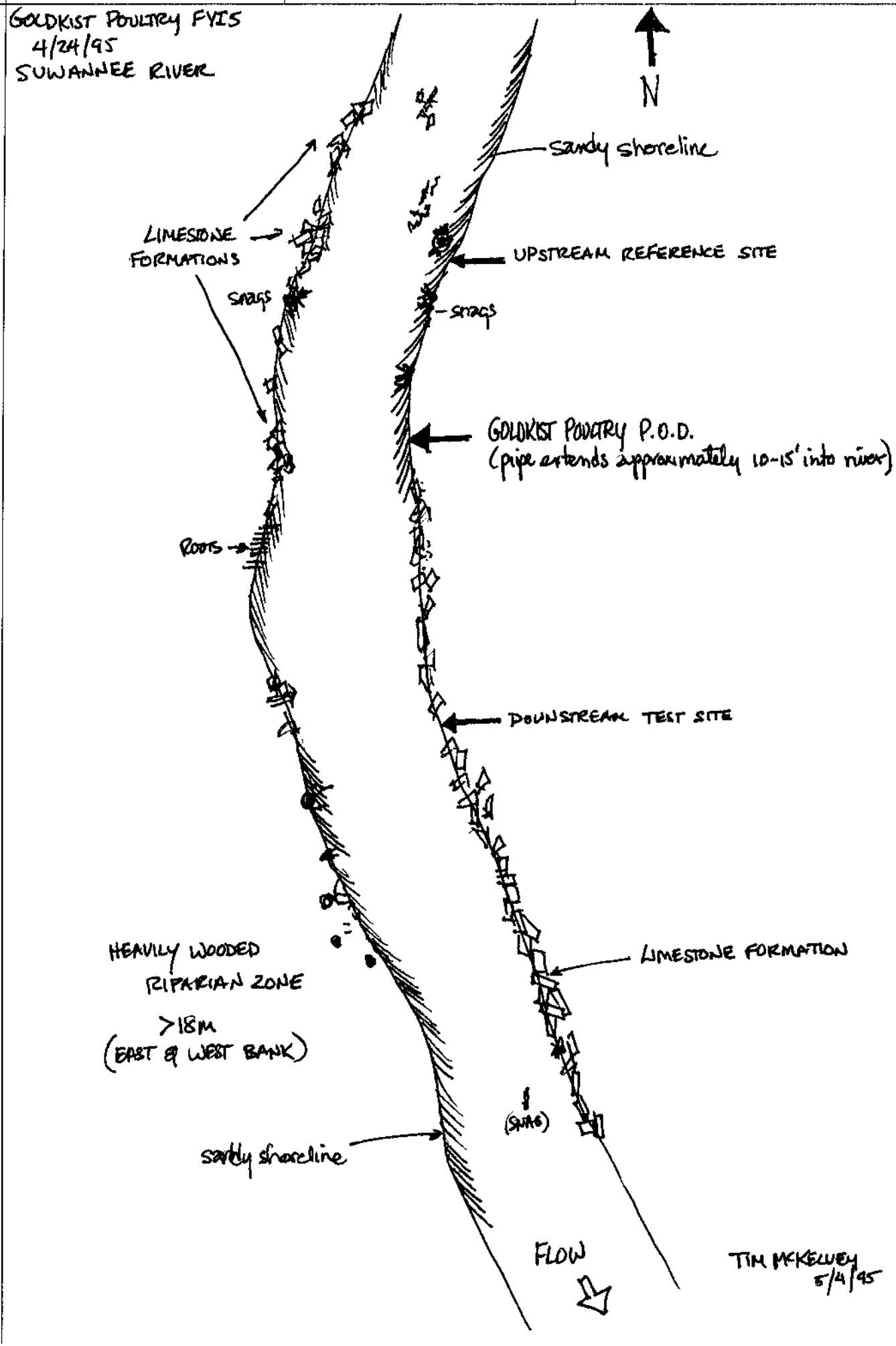
## Percentile Distribution

| Parameter | 5% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 95% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **STREAMS** (1617 stations) | | | | | | | | | | | |
| Phytoplankton Chlorophyll *a* | 0.22 | 0.52 | 0.94 | 1.60 | 3.02 | 4.63 | 6.72 | 9.87 | 14.68 | 27.35 | 48.70 |
| Periphyton Chlorophyll *a* | 0.31 | 0.43 | 0.77 | 1.04 | 2.16 | 2.94 | 6.45 | 10.51 | 17.00 | 39.51 | 60.85 |
| H-D Diversity | 0.84 | 2.12 | 2.48 | 2.74 | 2.88 | 3.09 | 3.25 | 3.40 | 3.52 | 3.76 | 3.90 |
| Qualitative Taxa Richness | 9.00 | 12.00 | 17.00 | 20.00 | 22.00 | 24.50 | 26.00 | 28.00 | 31.00 | 37.00 | 53.00 |
| H-D Taxa Richness | 6.00 | 6.50 | 9.00 | 11.50 | 13.00 | 15.00 | 17.00 | 21.50 | 26.00 | 29.00 | 32.00 |
| TKN | 0.30 | 0.39 | 0.56 | 0.73 | 0.87 | 1.00 | 1.11 | 1.26 | 1.49 | 1.93 | 2.80 |
| Ammonia | 0.02 | 0.02 | 0.04 | 0.05 | 0.06 | 0.08 | 0.11 | 0.14 | 0.20 | 0.34 | 0.60 |
| NO2-NO3 | 0.01 | 0.01 | 0.03 | 0.05 | 0.07 | 0.10 | 0.14 | 0.20 | 0.32 | 0.64 | 1.05 |
| Total Phosphorus | 0.02 | 0.03 | 0.05 | 0.06 | 0.10 | 0.13 | 0.18 | 0.25 | 0.39 | 0.74 | 1.51 |
| Ortho Phosphorus | 0.01 | 0.01 | 0.03 | 0.04 | 0.05 | 0.08 | 0.11 | 0.17 | 0.27 | 0.59 | 1.37 |
| Turbidity | 0.60 | 0.90 | 1.20 | 1.45 | 2.10 | 2.80 | 3.60 | 4.50 | 6.65 | 10.45 | 16.30 |
| **LAKES** (477 stations) | | | | | | | | | | | |
| Phytoplankton Chlorophyll *a* | 0.80 | 1.71 | 2.88 | 4.28 | 10.06 | 13.40 | 20.00 | 30.10 | 47.20 | 65.44 | 113.90 |
| Dredge Diversity | 0.71 | 0.97 | 1.43 | 1.74 | 1.98 | 2.12 | 2.21 | 2.59 | 2.85 | 3.15 | 3.17 |
| Dredge Taxa Richness | 3.00 | 5.00 | 6.50 | 7.00 | 9.00 | 10.00 | 11.00 | 13.00 | 15.00 | 17.00 | 21.00 |
| TKN | 0.36 | 0.49 | 0.67 | 0.83 | 1.08 | 1.26 | 1.40 | 1.51 | 1.68 | 2.11 | 3.46 |
| NH3+NH4 | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.12 | 0.15 | 0.21 | 0.28 |
| NO2-NO3 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.10 | 0.14 | 0.23 |
| Total Phosphorus | 0.01 | 0.02 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.23 | 0.42 |
| Ortho-Phosphorus | 0.00 | 0.01 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.08 | 0.21 | 0.32 |
| Turbidity | 1.00 | 1.25 | 1.55 | 2.05 | 2.75 | 4.50 | 6.45 | 9.60 | 14.10 | 26.00 | 40.00 |
| **ESTUARIES** (690 stations) | | | | | | | | | | | |
| Phytoplankton Chlorophyll *a* | 2.14 | 3.28 | 4.49 | 5.13 | 6.00 | 6.93 | 7.94 | 9.60 | 12.40 | 17.60 | 22.20 |
| Dredge Diversity | 1.34 | 1.53 | 1.91 | 2.28 | 2.56 | 2.90 | 3.15 | 3.59 | 4.01 | 4.53 | 4.98 |
| Dredge Taxa Richness | 4.00 | 6.00 | 9.00 | 11.00 | 15.00 | 18.50 | 25.00 | 35.00 | 41.00 | 62.00 | 90.00 |
| TKN | 0.26 | 0.34 | 0.42 | 0.50 | 0.59 | 0.69 | 0.76 | 0.82 | 0.95 | 1.30 | 1.49 |
| NH3+NH4 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.08 | 0.09 | 0.13 | 0.22 | 0.28 |
| NO2-NO3 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.08 | 0.17 | 0.23 |
| Total Phosphorus | 0.01 | 0.02 | 0.06 | 0.07 | 0.10 | 0.11 | 0.14 | 0.17 | 0.23 | 0.43 | 0.59 |
| Ortho-Phosphorus | 0.01 | 0.02 | 0.03 | 0.04 | 0.04 | 0.05 | 0.07 | 0.09 | 0.12 | 0.21 | 0.44 |
| Turbidity | 3.50 | 4.00 | 4.50 | 5.05 | 5.40 | 5.60 | 6.30 | 6.80 | 8.00 | 11.40 | 11.75 |

Units:
Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* ($mg/m^2$), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates


1
2
3
Continue on Page 37
A
B
Continue on Page 54
P.O.D
GOLDKIST
Crossroads
Blue Spring
HAMILTON CO
MADISON CO
Holton Spring
Alapaha Rise
Spring
Suwannee River
HAMILTON CO
SUWANNEE CO
Madison County Airport (NRG)
Florida Sheriff's Boys Ranch Airport (NRG)
Suwannee River State Park
Lime Spring
Falmouth
Dinsles
MADISON CO
SUWANNEE CO
MADISON CO
LAFAYETTE CO
TAYLOR CO
LAFAYETTE CO
Dowling Park
Live Oak
PERRY
SEABOARD COAST LINE
SOUTH GEORGIA
RIVER RD
KNIGHTS RD
HARRELL RD
ROBERSON RD
MITCHELL RD
DISTRICT LINE RD
CHURCH RD
LANCASTER RD
PINE LAKE RD
CAMP 7 RD
PINE LINE RD
ELEVENTH AV
Slade St


STATE OF FLORIDA
STATE ROAD DEPARTMENT AND
INTERNAL IMPROVEMENT FUND
FAI
7.5 MIN
4344 I NW
(ELLAVILLE)
R. 11 E.
R. 12 E.
ELLAVILLE 7 MI.
FLOW
260
Dempsey Lake
REFERENCE SITE
TRAIL
JEEP
POD (DISCHARGE)
TEST SITE
FLOW
25
PIPELINE
30
GOLDKIST FACILITY
SEABOARD
AIR
BM 69
Falmouth Lookout Tower
I-10
35
36
31
Anderson Spring
MADISON CO.
SUWANNEE CO.
Shady Grove Ch
Cem
2
1
6
5


GOLDKIST POULTRY FYIS
4/24/95
SUWANNEE RIVER
N
sandy shoreline
LIMESTONE FORMATIONS
UPSTREAM REFERENCE SITE
snags
snags
GOLDKIST POULTRY P.O.D.
(pipe extends approximately 10-15' into river)
ROOTS
DOWNSTREAM TEST SITE
HEAVILY WOODED RIPARIAN ZONE
>18m
(EAST & WEST BANK)
LIMESTONE FORMATION
(SNAG)
sandy shoreline
FLOW
TIM McKELVEY
5/4/95

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

# FACILITY SUMMARY

| | | |
|---|---|---|
| Facility Name: Gold Kist - Poultry D.U. | | Date Summary Prepared: 5/11/95 |
| Location (attach detailed map): | County: Suwannee | District: Northeast |
| Federal Permit # FL0001465 and expiration date: 9/30/96 | State GMS # and State expiration date: 3161P05012 7/16/96 | Facility Type: (Industrial) Municipal Federal Agricultural Other (list): |

Function of facility:
Poultry Processing Plant & Rendering facility

Description of treatment process:
Primary Treatment consisting of Dissolved Air Flotation. Secondary Treatment consisting of one (1) Trickling Filter in series with the extended aeration activated sludge reactor with two (2) clarifiers operated in parallel. Effluent from clarifiers flows to tertiary treatment consisting of one stabilization pond for nutrient removal and two sand filters. Effluent is chlorinated and dechlorinated before discharge to pipeline that flows to Suwannee R.

| | | |
|---|---|---|
| Receiving waters: Suwannee R. | Classification: I II (III) Fresh OFW | |
| Design Flow: 1.64 MGD | Mean Flow: 0.819 MGD | Flow during survey: |

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

therefore, the best time to sample is: When Suwannee River is at normal levels

If facility has a mixing zone, give details (size, parameters affected, etc.):
None

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

| Parameter | Limit (units) |
|---|---|
| See attachment Specific Condition # 1 | |

Describe special permit conditions and permit modifications:
The facility was issued construction permit IC61-213794 on 10/25/93 for construction/operation of tertiary treatment to control nutrient levels and to extend spray field area for digested sludge.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

## FACILITY SUMMARY

Gold Kist - Poultry Div.
(Facility)

**Description of permitted outfall(s):** Submerged effluent pipe with manholes along length for sampling

**List permit violations (from MOR data or other source) and plant upsets that occurred within past year:** High TSS and Fecal Coliform bacteria counts during 11/94. Facility attributes to death of small fish interfering with sand filter operation due to plant harvesting of stabilization pond.

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

Facility entered due to high nutrient level being discharged to Suwannee. Facility obtained construction permit and added tertiary treatment to resolve situation.

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

Trends show that Gold Kist has improved considerably the quality of the effluent discharged. Un-ionized Ammonia, TKN, and Fecal Coliform values reported from 1992 to present have decreased significantly due to addition of tertiary treatment.

**Additional information:**

**Staff contributing to this review (signature):**

| | |
|---|---|
| Tim McKelvey | (Biologist) |
| Michael L. Lindsey | (Inspector) |
| Michael L. Lindsey | (Engineer) |
| | ( ) |
| | ( ) |
| | ( ) |

.TTEE:

Gold Kist - Live Oak Poultry Plant

I.D. Number: 31P05012
Permit Number: I061-168545
Date of Issue: July 16, 1991
Expiration Date: July 16, 1996

SPECIFIC CONDITIONS:

1. Operation reports containing results of the following examinations shall be submitted on a monthly basis to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7577:

| Sample Location | Parameters | Effluent Limitations: Monthly Average | Daily Max. | Long Term Ann. Avg. | Frequency | Sample Type |
|---|---|---|---|---|---|---|
| Influent | $BOD_5$ (mg/L) | - - - | - - | - - - - | 1/month | 24-hour Composite |
| | TSS (mg/L) | - - - | - - | - - - - | 1/month | 24-hour Composite |
| Effluent prior to mixing with receiving waters | Flow (MGD) | - - - | - - | - - - - | Continuous | Recorder |
| | $BOD_5$ (mg/L) | 18 | 24.3 | 15.0 | 1/week | 24-hour Composite |
| | TSS (mg/L) | 25.5 | 46.2 | 20.0 | 1/week | 24-hour Composite |
| | TKN (mg/L) | 10 | 15.0 | - - - - | 1/week | 24-hour Composite |
| | TRC (mg/L) | | 0.01 | - - - - | 1/week | Grab |
| | Oil & Grease* (mg/L) | 5.0 | - - | 5.0 | 1/week | Grab |
| | pH (S.U.) | 6.0 | 8.5 | - - - - | 1/week | Grab |
| | Fecal Coliform (#/100 ml) | - - - | 200 | - - - - | 1/week | Grab |
| | Unionized Ammonia as N (mg/L) | - - - | .02 | - - - - | 1/week | Grab |
| | Bioassay | See Spec. Cond. #2 | | | Quarterly | Grab |
| Ambient sampling at locations A and B shown in Attachment A | D.O. (mg/L) | - - - | - - | - - - - | 1/month** | Grab |
| | pH (S.U.) | - - - | - - | - - - - | 1/month** | Grab |
| | TKN (mg/L)) | - - - | - - | - - - - | 1/month** | Grab |
| | Unionized Ammonia as N (mg/L) | - - - | - - | - - - - | 1/month** | Grab |
| | $NO_3$ as N (mg/L) | - - - | - - | - - - - | 1/month** | Grab |

* Pursuant to Rule 17-302.510(3)(k), FAC, the appropriate method that must be used to determine compliance with this permit and limit is 5520B, 17th Edition of Standard Methods.

** The Permittee shall conduct the ambient water sampling at the specified frequency for a period of one year from the effective date of this permit. Upon completion of the collection of one year's sampling data, the Department will examine the need for additional monitoring.

705-7357

PERMITTEE:

Gold Kist, Inc.-Live Oak Plant

I.D. Number: 3161P05012
Permit Number: I061-168545
Date of Issue: July 16, 1991
Expiration Date: July 16, 1996
Modification Date: February 26, 1996

1. Operation reports containing results of the follwing examinations shall be submitted on a monthly basis to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7577:

| Sample Location | Parameters | Effluent Limitations | | | Frequency | Sample Type |
|---|---|---|---|---|---|---|
| | | Monthly Average | Daily Max. | Long Term Ann. Avg. | | |
| Influent | $BOD_5$ (mg/L) | - - - | - - | - - - - | 1/month | 24-hour Composite |
| | TSS (mg/L) | - - - | - - | - - - - | 1/month | 24-hour Composite |
| Effluent prior to mixing with receiving waters | Flow (MGD) | - - - | - - | - - - - | Continuous | Recorder |
| | $BOD_5$ (mg/L) | 18 | 24.3 | 15.0 | 1/week | 24-hour Composite |
| | TSS (mg/L) | 25.5 | 46.2 | 20.0 | 1/week | 24-hour Composite |
| | TKN (mg/L) | 10 | 15.0 | - - - - | 1/week | 24-hour Composite |
| | TRC (mg/L) | | | - - - - | 1/week | Grab |
| | Oil & Grease* (mg/L) | 5.0 | - - | 5.0 | 1/week | Grab |
| | pH (S.U.) | 6.0 | 8.5 | - - - - | 1/week | Grab |
| | Fecal Coliform (#/100 ml) | - - - | 200 | - - - - | 1/week | Grab |
| | Unionized Ammonia as N (mg/L) | - - - | .02 | - - - - | 1/week | Grab |
| | Bioassay | See Spec. Cond. #2 | | | See Spec. Cond. #2 | |
| Ambient sampling at locations A and B shown in Attachment A | D.O. (mg/L) | - - - | - - | - - - - | 1/month** | Grab |
| | ph (S.U.) | - - - | - - | - - - - | 1/month** | Grab |
| | TKN (mg/L) | - - - | - - | - - - - | 1/month** | Grab |
| | Unionized Ammonia as N (mg/L) | - - - | - - | - - - - | 1/month** | Grab |
| | $NO_3$ as N (mg/L) | - - - | - - | - - - - | 1/month** | Grab |

# STATE OF FLORIDA
## DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

| SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP. NED-TAL | STORET STATION NUMBER: 21010018 | DATE (M/D/Y): 4/24/95 | TIME: 3:30pm | RECEIVING BODY OF WATER: SUWANNEE RIVER |
|---|---|---|---|---|

| REMARKS: river level down 6ft. since last sampling, canopy of periphyton racks depressed | LOCATION: REFERENCE SITE ABOVE GOLDKIST POULTRY P.O.D. (100 yards upstream) | FIELD ID/NAME: 21010018 |
|---|---|---|

RIPARIAN ZONE/INSTREAM FEATURES

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

| Forest/Natural | Silviculture | Field/Pasture | Agricultural | Residential | Commercial | Industrial | Other (Specify) |
|---|---|---|---|---|---|---|---|
| 95 | | | | | | 5 | |

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

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

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

*List & map dominant vegetation on back*

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 4m (above surface)

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) | 45 | 5 | dipnet | Riffles | | | |
| Leaf Packs or Mats | 10 | 5 | dipnet | Sand | 15 | | |
| Aquatic Vegetation | | | | Mud/Muck/Silt | | | |
| Rock or Shell Rubble | 10 | 5 | dipnet | Other: | | | |
| Undercut Banks/Roots | 20 | 5 | dipnet | *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): | turbidity | | Secchi (m): |
|---|---|---|---|---|---|---|---|---|
| Top | 0.0 | 21.72 | 7.25 | 4.47 | 211.0 | 23.9 | | 1.0 |
| Mid-depth | 1.5 | | | | | | | |
| Bottom | 3.0 | | | | | | | |

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:

Cool 60-65°, rain front passed over, slight rain, cloudy in AM, sunny in PM.

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

| SAMPLING TEAM: | SIGNATURE: | DATE: |
|---|---|---|
| Tim McKelvey Ruth Bowman | Timothy R. McKelvey | 4/24/95 |

Turbidity was 9 January 1995 sample run

# STATE OF FLORIDA
## DEPARTMENT OF ENVIRONMENTAL PROTECTION
### FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

| SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: NED-JAX FDEP | STORET STATION NUMBER: 21010018 | DATE (M/D/Y): 4/24/95 | RECEIVING BODY OF WATER: SUWANNEE RIVER |
|---|---|---|---|

| REMARKS: river level down 6ft. since Heater Dendy & periphyton racks deployed | LOCATION: REFERENCE SITE ABOVE GOLDKIST POULTRY P.O.D | FIELD ID/NAME: 21010018 |
|---|---|---|

| Habitat Parameter | Optimal | Suboptimal | Marginal | Poor |
|---|---|---|---|---|
| **Bottom Substrate/ Available Cover** [16] | Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 (16) | 20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11 | 5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6 | Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1 |
| **Water Velocity** [20] | Max. observed: >0.25 m/sec. but < 2 m/sec (20) 19 18 17 16 | Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11 | Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6 | Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1 |
| **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 |
| **Deposition** [16] | 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 |
| **Bank Stability** [10] | Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16 | Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11 | Moderately unstable. Moderate areas of erosion, high erosion potential during floods (10) 9 8 7 6 | Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1 |
| **Riparian Buffer Zone Width** [20] | Width of native vegetation (least buffered side) greater than 18 m (20) 19 18 17 16 | Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11 | Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6 | Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1 |
| **Riparian Zone Vegetation Quality** [20] | Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. (20) 19 18 17 16 | 50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11 | 25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6 | Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1 |

[5] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

**Comments**

[127] **TOTAL SCORE**

| ANALYSIS DATE: 4/24/95 3:30pm | ANALYST: McKelvey/Bowman | SIGNATURE: Kim McKelvey |
|---|---|---|

# STATE OF FLORIDA
## DEPARTMENT OF ENVIRONMENTAL PROTECTION

### PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

| SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP NED-JAX | STORET STATION NUMBER: 21FL0072 | DATE (M/D/Y): 4/24/95 | TIME: 2:00 p.m. | RECEIVING BODY OF WATER: SUWANNEE RIVER |
|---|---|---|---|---|

| REMARKS: river level down 6ft. since hester-dendys & periphyton racks deployed | LOCATION: TEST SITE BELOW GOLDKIST POULTRY P.O.D. (100 yds downstream) | FIELD ID/NAME: 21FL0072 |
|---|---|---|

RIPARIAN ZONE/INSTREAM FEATURES

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

| Forest/Natural | Silviculture | Field/Pasture | Agricultural | Residential | Commercial | Industrial | Other (Specify) |
|---|---|---|---|---|---|---|---|
| 90% | | | | 5% | | 5% | |

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

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

Width of riparian vegetation (m) on least buffered side: > 18m — *List & map dominant vegetation on back*

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

Velocity 1 m/sec — depth: 3-4 m in center — width of river: 100 yards

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 4m above surface

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) | 30 | 6 | dipnet | Riffles | | | |
| Leaf Packs or Mats | | | | Sand | 20 | 2 | dipnet |
| Aquatic Vegetation | | | | Mud/Muck/Silt | | | |
| Rock or Shell Rubble | 30 | 6 | dipnet | Other: | | | |
| Undercut Banks/Roots | 20 | 6 | dipnet | *Draw aerial view sketch of habitats found in 100 m section* | | | |

wine stone

| WATER QUALITY | Depth (m): | Temp. (°C): | pH (SU): | D.O. (mg/l): | Cond. (µmho/cm) or Salinity (ppt): | turbidity NTU | | Secchi (m): |
|---|---|---|---|---|---|---|---|---|
| Top | 0 | | | | | | | 1.0m |
| Mid-depth | 1.5 | 21.63 | 7.15 | 4.76 | 215.0 | 5.6 | | |
| Bottom | 3.0 | | | | | | | |

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:

Cloudy, cool, 60-70°F in A.M

Sunny, cool 70°F in P.M

HESTER-DENDY'S HIGH AND DRY

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

| SAMPLING TEAM: | SIGNATURE: | DATE: |
|---|---|---|
| TIM McKELVEY RUTH BOWMAN | Tim McKelvey | |

# STATE OF FLORIDA
## DEPARTMENT OF ENVIRONMENTAL PROTECTION
### FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

| SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP NED JAX | STORET STATION NUMBER: 21010072 | DATE (M/D/Y): 4/24/95 | RECEIVING BODY OF WATER: SUWANEE RIVER |
|---|---|---|---|

| REMARKS: River level down 6ft since H.D. & periphyton rocks deployed | LOCATION: TEST SITE BELOW GOLDKIST P.O.D. | FIELD ID/NAME: 21010072 |
|---|---|---|

| Habitat Parameter | Optimal | Suboptimal | Marginal | Poor |
|---|---|---|---|---|
| **Bottom Substrate/ Available Cover** [15] | Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16 | 20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). (15) 14 13 12 11 | 5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6 | Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1 |
| **Water Velocity** [20] | Max. observed: >0.25 m/sec. but < 2 m/sec (20) 19 18 17 16 | Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11 | Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6 | Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1 |
| **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 |
| **Deposition** [16] | 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 |
| **Bank Stability** [10] | Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16 | Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11 | Moderately unstable. Moderate areas of erosion, high erosion potential during floods. (10) 9 8 7 6 | Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1 |
| **Riparian Buffer Zone Width** [20] | Width of native vegetation (least buffered side) greater than 18 m (20) 19 18 17 16 | Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11 | Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6 | Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1 |
| **Riparian Zone Vegetation Quality** [20] | Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. (20) 19 18 17 16 | 50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11 | 25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6 | Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1 |

[5] Add 5 points if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

[126] **TOTAL SCORE**

Comments: River ~~bed~~ level down below optimum substrates.

| ANALYSIS DATE: 4/24/95 | ANALYST: Tim McKelvey | SIGNATURE: Tim McKelvey |
|---|---|---|

# FDEP Biology Section — Acute Bioassay Bench Sheet

**Sample Source:** Goldkist poultry
**County:**
**Contact / District:**
**NPDES Permit #:** FL00
**LIMS Sample #:** 104833 **LIMS Job #:** 95-APR-25-25

**Sample Collection:** Date 4-24-95 Time 1300
**Test Beginning:** Date 4-25-95 Time 1530
**Test Ending:** Date 4-27-95 Time 1530
**Organism Batch #:** 23 **Diluent Batch #:** 17
**Organism Age:** <24 hrs.
***Test Organism:*** Ceriodaphnia dubia

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

**Test Number:** 2 of 4

**Remarks:** Cl⁻

**Instrument Calibrations:**

| | pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm |
|---|---|---|---|---|
| meter # | 7851 | 90H018262 | 90H018262 | G9005749 |
| 0 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.5 @ 23.6 | 8.5 @ 23.3 °C | 1540 @ 10.73<br>107.6 @ 98.6 @ 24.2 °C |
| 24 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 24.3 @ 24.4 | 8.4 @ 23.8 °C | 15.3 @ 107.3<br>107.6 @ 98.6 @ 24.1 °C |
| 48 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.8 @ 23.9 | 8.2 @ 25.2 °C | 1083 @ 95.6<br>1008 @ 1004 @ 24.5 °C |

| Conc. | Chamber # | Number Live 0 hr | Number Live 24 h | Number Live 48 h | pH 0 hr | pH 24 h | pH 48 h | Temperature (°C) 0 hr | Temperature (°C) 24 h | Temperature (°C) 48 h | D.O. (mg/L) 0 hr | D.O. (mg/L) 24 h | D.O. (mg/L) 48 h | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 24 h | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | A | 5 | 5 | 5 | 8.1 | | 8.2 | 23.6 | | 24.0 | 7.8 | | 8.3 | 170 | | 190 |
| Control | B | 5 | 5 | 5 | | | 8.2 | | | 23.7 | | | 8.3 | | | 190 |
| Control | C | 5 | 5 | 5 | | | 8.2 | | | 23.6 | | | 8.4 | | | 190 |
| Control | D | 5 | 5 | 5 | | | 8.2 | | | 23.4 | | | 8.4 | | | 190 |
| 100% | A | 5 | 5 | 5 | 7.0 | | 8.3 | 23.5 | | 24.0 | 7.7 | | 8.4 | 1155 | | 1140 |
| 100% | B | 5 | 5 | 5 | | | 8.3 | | | 23.9 | | | 8.4 | | | 1170 |
| 100% | C | 5 | 5 | 5 | | | 8.3 | | | 23.8 | | | 8.4 | | | 1160 |
| 100% | D | 5 | 5 | 5 | | | 8.3 | | | 23.7 | | | 8.4 | | | 1180 |
| Recorded by: | | MF | TR | MF | MF | | JHS | MF | | JHS | MF | | JHS | MF | | JdS |
| Measured/Loaded by: | | MF | MF | MF | MF | | MF | MF | | MF | MF | | MF | MF | | MF |

**Investigators' Signatures**

Marshall Faulcon
Robin C. Rader
Joseph Smith
Jennifer Sparagan
Reviewer

| | Salt Water / Well Water | Water Quality Parameters: 20% Min Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | | | |
| Lab Total Residual Cl2 (mg/L): | | <0.03 | 0.14 | DR-100 | TR |
| Alkalinity (mg/L as $CaCO_3$): | | 75 | 125 | Hach | TR |
| Hardness (mg/L as $CaCO_3$): | | 80 | 400 | Hach | TR |
| Total ammonia (mg/L as N): | | <0.017 | 6.84 | Orion | JN |

Ammonia Meter #98136 Ammonia Meter Slope: -58.6 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 10/05/94

# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Goldkist Poultry
County: P
Contact / District: ~~Tim McKelvey / NE~~
NPDES Permit #: FL00~~40274~~
LIMS Sample #: ~~10480T~~ LIMS Job #: ~~95-Apr-25-16~~ 95-APR-25.25 TR
10483 3 wrong sample TR 4/26/95

Sample Collection: Date 4-24-95 Time 1300
Test Beginning: Date 4-25-95 Time 1530
Test Ending: Date 4-27-95 Time 1530
Organism Batch #: 16 Diluent Batch #: MKW
Organism Age: 11 days
Test Organism: Cyprinella leedsi

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 4
Remarks: Cl-

| Instrument Calibrations: | pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm |
|---|---|---|---|---|
| meter # | 7851 | 90H018262 | 90H018262 | G9005749 |
| 0 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.5 @ 23.6 | 8.5 @ 23.3 °C | 15.40 @ 10.73<br>107.6 @ 98.6 @ 24.2 °C |
| 24 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 24.3 @ 24.4 | 8.4 @ 23.8 °C | 15.3 @ 10.73 997@1004<br>107.6 @ 98.6 @ 24.1 °C |
| 48 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.8 @ 23.9 | 8.2 @ 25.2 °C | 108.3 @ 98.6 1004 @ 1004<br>1008 @ 1004 @ 24.5 °C |

| | | Number Live | | | pH | | | Temperature (°C) | | | D.O. (mg/L) | | | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conc. | Chamber # | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h |
| CTL A | 76 | 5 | 5 | 5 | 7.8 | 8.2 | 8.3 | 23.9 | 23.4 | 23.6 | 7.7 | 8.3 | 8.3 | 245 | 250 | 250 |
| CTL B | 476 | 5 | 5 | 5 | 7.8 | 8.2 | 8.3 | | | 23.4 | 7.7 | 8.3 | 8.2 | 245 | 250 | 250 |
| CTL C | 132 | 5 | 5 | 5 | 7.8 | 8.2 | 8.3 | | | 23.4 | 7.7 | 8.3 | 8.4 | 245 | 250 | 250 |
| CTL D | 43 | 5 | 5 | 4 | 7.8 | 8.2 | 8.3 | | | 23.5 | 7.7 | 8.4 | 8.4 | 245 | 245 | 250 |
| 100% A | 210 | 5 | 5 | 5 | 6.6 | 7.4 | 7.9 | 23.9 | 23.7 | 23.7 | 7.5 | 7.8 | 8.3 | 1185 | 1190 | 1200 |
| 100% B | 120 | 5 | 5 | 5 | 6.6 | 7.4 | 7.9 | | | 23.7 | 7.3 | 7.7 | 8.1 | 1185 | 1190 | 1200 |
| 100% C | 888 | 5 | 5 | 5 | 6.6 | 7.3 | 7.8 | | | 23.7 | 7.3 | 7.8 | 8.0 | 1185 | 1185 | 1200 |
| 100% D | 3 | 5 | 5 | 5 | 6.6 | 7.2 | 7.8 | | | 23.8 | 7.3 | 7.8 | 8.0 | 1180 | 1180 | 1190 |
| Recorded by: | | TR | TR | MF | TR | TR | JAS | TR | TR | JAS | TR | TR | JAS | TR | TR | JAS |
| Measured/Loaded by: | | MF | TR | MF | MF | MF | MF | MF | MF | MF | MF | MF | MF | MF | MF | MF |

Investigators' Signatures

Reviewer

form updated 10/05/94

| Water Quality Parameters | Salt Water (Well Water) / 20% Min Water | Sample | Method | Measured by |
|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | | |
| Lab Total Residual Cl2 (mg/L): | <0.03 | 0.14 | DR 100 | TR |
| Alkalinity (mg/L as $CaCO_3$): | 125 | 125 | Hach | TR |
| Hardness (mg/L as $CaCO_3$): | 120 | 400 | Hach | TR |
| Total ammonia (mg/L as N): | <0.017 | 6.84 | orion | JN |

Ammonia Meter #98136 Ammonia Meter Slope: -58.6 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

# FDEP Biology Section — Acute Bioassay Bench Sheet

**Sample Source:** Goldkist Poultry
**County:**
**Contact / District:**
**NPDES Permit #:** FL00
**LIMS Sample #:** 104833 **LIMS Job #:** 95-Apr-25-25

**Sample Collection:** Date 4-24-95 Time 1300
**Test Beginning:** Date 4-25-95 Time 1530
**Test Ending:** Date 4-27-95 Time 1530
**Organism Batch #:** 23 **Diluent Batch #:** 17
**Organism Age:** < 24 hrs
***Test Organism:*** *Ceriodaphnia dubia*

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

**Test Number:** 4 of 4

**Remarks:** dz. Cl⁻
Sodium thiosulfate (0.025 N) added at the rate of 0.2 mL/Liter.

| Instrument Calibrations: | pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm |
|---|---|---|---|---|
| meter # | 7851 | 90H018262 | 90H018262 | G9005749 |
| 0 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.5 @ 23.6 | 8.5 @ 23.3 °C | 15.40 @ 10.73<br>107.6 @ 98.6 @ 24 (9976) |
| 24 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 24.3 @ 24.4 | 8.4 @ 23.8 °C | 15.3 @ 10.73<br>107.6 @ 98.6 @ 24 |
| 48 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.8 @ 23.9 | 8.2 @ 25.2 °C | 108.3 @ 98.2 @ 4°C<br>1008 @ 1004 @ 24 |

| | | Number Live | | | pH | | | Temperature (°C) | | | D.O. (mg/L) | | | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conc. | Chamber # | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h |
| Control | A | 5 | 5 | 5 | 8.1 | | 8.2 | 23.6 | | 24.3 | 7.9 | | 8.4 | 170 | | 200 |
| Control | B | 5 | 5 | 5 | | | 8.2 | | | 24.1 | | | 8.3 | | | 195 |
| Control | C | 5 | 5 | 5 | | | 8.2 | | | 24.0 | | | 8.3 | | | 195 |
| Control | D | 5 | 5 | 5 | | | 8.2 | | | 23.9 | | | 8.3 | | | 200 |
| 100% | A | 5 | 5 | 5 | 6.8 | | 8.2 | 23.4 | | 24.7 | 7.8 | | 8.1 | 1115 | | 1300 |
| 100% | B | 5 | 5 | 5 | | | 8.3 | | | 24.5 | | | 8.0 | | | 1215 |
| 100% | C | 5 | 5 | 5 | | | 8.2 | | | 24.4 | | | 8.1 | | | 1225 |
| 100% | D | 5 | 5 | 5 | | | 8.2 | | | 24.3 | | | 8.1 | | | 1280 |
| Recorded by: | | MF | TR | MA | MF | | JAS | MF | | JAS | MF | | JAS | MP | | JAS |
| Measured/Loaded by: | | MF | MF | MP | MF | | MF | MF | | MC | MF | | MF | MP | | MF |

**Investigators' Signatures**
Marshall Faircloth
John G. Rader
Stephen Smith
Jennifer Sparagana
Reviewer

| | Salt Water / Well Water | 20% Min Water | Sample | Method (w/ range #) | Measured by |
|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | <0.03 TR | | |
| Lab Total Residual Cl2 (mg/L): | | <0.03 | ~~0.14 R~~ | DR-100 | TR |
| Alkalinity (mg/L as $CaCO_3$): | | 75 | 125 | Hach | TR |
| Hardness (mg/L as $CaCO_3$): | | 80 | 400 | Hach | TR |
| Total ammonia (mg/L as N): | | <0.017 | ~~<0.017~~ A 6.84 4/28/95 | Orion | JN |

Ammonia Meter #98136 Ammonia Meter Slope: -58.6 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0

form updated 10/05/94

# FDEP Biology Section — Acute Bioassay Bench Sheet

**Sample Source:** Goldkist Poultry
**County:**
**Contact / District:**
**NPDES Permit #:** FL00
**LIMS Sample #:** 104833 **LIMS Job #:** 95-APR-25-25

**Sample Collection:** Date 4-24-95 Time 1300
**Test Beginning:** Date 4-25-95 Time 1530
**Test Ending:** Date 4-27-95 Time 1530
**Organism Batch #:** 16 **Diluent Batch #:** well
**Organism Age:** 11 days
***Test Organism:*** Cyprinella leedsi

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

**Test Number:** 3 of 4

**Remarks:** de.Cl- (0.025N) Sodium Thiosulfate added at the rate of .2 ml/liter

| Instrument Calibrations: | pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm |
|---|---|---|---|---|
| meter # | 7851 | 90H018262 | 90H018262 | G9005749 |
| 0 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.5 @ 23.6 | 8.5 @ 23.3 °C | 15.40 @ 10.73<br>107.6 @ 98.6 @ 24.2 °C |
| 24 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 24.3 @ 24.4 | 8.4 @ 23.8 °C | 15.3 @ 10.73 997@1004<br>107.6 @ 98.6 @ 24.1 °C |
| 48 hr | 7.0 @ 7.0<br>10.0 @ 10.0 | 23.8 @ 23.9 | 8.2 @ 25.2 °C | 108.3 @ 98.6 1004 @ 1004<br>1008 @ 1004 @ 24.5 °C |

* 7.6 recorded wrong #

| | | Number Live | | | pH | | | Temperature (°C) | | | D.O. (mg/L) | | | UNCORRECTED Cond. (µmhos/cm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conc. | Chamber # | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h | 0 hr | 24 h | 48 h |
| Ctl A | 412 | 5 | 5 | 5 | ~~8.1~~ | 8.2 | 8.3 | 23.4 | 23.0 | 23.7 | 7.7 | 8.3 | 8.1 | 245 | 245 | ~~250~~ |
| Ctl B | 350 | 5 | 5 | 5 | 7.8 | 8.2 | 8.3 | | | 23.3 | 7.6 | 8.3 | 8.3 | 245 | 245 | 245 |
| Ctl C | 9 | 5 | 5 | 5 | 7.8 | 8.2 | 8.3 | | | 23.3 | 7.7 | 8.3 | 8.3 | 245 | 250 | 250 |
| Ctl D | 4 | 5 | 5 | 5 | 7.8 | 8.2 | 8.3 | | | 23.5 | 7.8 | 8.4 | 8.3 | 245 | 245 | ~~250~~ |
| 100% A | 366 | 5 | 5 | 5 | 6.9 | 7.5 | 7.9 | 23.9 | 23.2 | 23.6 | 7.6 | 8.0 | 8.1 | 1185 | 1170 | 1190 |
| 100% B | 25 | 5 | 5 | 5 | 6.9 | 7.5 | 7.8 | | | 23.4 | 7.6 | 7.9 | 8.0 | 1185 | 1170 | 1180 |
| 100% C | 53 | 5 | 5 | 5 | 6.9 | 7.5 | 7.8 | | | 23.3 | 7.6 | 7.9 | 7.8 | 1185 | 1170 | 1175 |
| 100% D | 57 | 5 | 5 | 5 | 6.9 | 7.5 | 7.8 | | | 23.4 | 7.6 | 7.9 | 7.7 | 1185 | 1180 | 1185 |
| Recorded by: | | mf | TR | MF | mf | TR | JOS | TR | TR | JOS | TR | TR | JOS | TR | TR | JOS |
| Measured/Loaded by: | | mf | TR | MF | mf | MF | mf | MF | MF | mf | MF | MF | mf | MF | MF | mf |

**Investigators' Signatures**

Reviewer

| Water Quality Parameters | Salt Water: Well Water | 20% Min Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | <0.03 TR | | |
| Lab Total Residual Cl2 (mg/L): | <0.03 | | ~~0.14~~ * (wrong #) | DR 100 | TR |
| Alkalinity (mg/L as $CaCO_3$): | 125 | | 125 | Hach | TR |
| Hardness (mg/L as $CaCO_3$): | 120 | | 400 | Hach | TR |
| Total ammonia (mg/L as N): | <0.017 | | 6.84 | Orion | JN |

Ammonia Meter #98136 Ammonia Meter Slope: 58.6 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 10/05/94

Bentic macroinvertebrate taxa list for Gold Kist, Inc.–Poultry Division, collected via Hester-Dendy artificial substrates on 24 April 1995. Densities, in number/$m^2$, represent the mean of three replicates. The Reference Site was located in the Suwannee River, 100 m upstream of the discharge, and the Test Site was located in the Suwannee River 100 m below the discharge.

| | Reference Site | Test Site |
|---|---|---|
| **Platyhelminthes** | | |
| *Dugesia* sp. | 1 | – |
| *Dugesia tigrina* | 2 | – |
| **Oligochaeta** | | |
| *Nais behningi* | – | 1 |
| *Nais simplex* | – | 1 |
| *Slavina appendiculata* | – | 2 |
| **Gastropoda** | | |
| *Ferrissia hendersoni* | 1 | – |
| **Pelecypoda** | | |
| Pisidiidae | 1 | – |
| **Acarina** | | |
| *Arrenurus* sp. | 1 | – |
| *Mideopsis* sp. | 1 | – |
| **Isopoda** | | |
| *Caecidotea* sp. | – | 1 |
| *Lirceus* sp. | – | 1 |
| **Amphipoda** | | |
| *Hyalella azteca* | 1 | – |
| **Ephemeroptera** | | |
| *Stenacron* sp. | – | 1 |
| *Stenacron interpunctatum* | 2 | – |
| *Stenonema exiguum* | 10 | 16 |
| *Stenonema smithae* | 1 | – |
| *Tricorythodes albilineatus* | – | 2 |
| Heptageniidae | – | 1 |
| **Odonata** | | |
| *Argia moesta* | 1 | – |
| **Plecoptera** | | |
| *Perlesta placida* | – | 1 |
| **Coleoptera** | | |
| *Hydroporus* sp. | 1 | – |
| *Microcylloepus pusillus* | – | 3 |
| *Stenelmis* sp. | – | 2 |
| **Megaloptera** | | |
| *Corydalus cornuta* | – | 1 |
| **Trichoptera** | | |
| *Cyrnellus fraternus* | 1 | – |
| Trichoptera | 1 | – |
| **Diptera** | | |
| *Rheopelopia* sp. | – | 19 |
| *Cladotanytarsus* sp. | – | 1 |

| | | |
|---|---|---|
| *Corynoneura* sp. B Epler | – | 1 |
| *Hemerodromia* sp. | – | 10 |
| *Nilothauma* sp. | – | 1 |
| *Polypedilum convictum* grp. | 3 | 13 |
| *Polypedilum fallax* | – | 1 |
| *Polypedilum scalaenum* grp. | 4 | 3 |
| *Rheotanytarsus* sp. | – | 7 |
| *Rheotanytarsus distinctissimus* grp. | 2 | 99 |
| *Rheotanytarsus exiguus* grp. | 4 | 74 |
| *Stelechomyia perpulchra* | – | 1 |
| *Tanytarsus* sp. | – | 1 |
| *Tanytarsus* sp. A Epler | – | 1 |
| *Tanytarsus* sp. C Epler | – | 1 |
| *Tanytarsus* sp. D Epler | 6 | 19 |
| Chironomidae | 6 | 19 |

Benthic macroinvertebrate taxa list for Gold Kist, Inc.–Poultry Division, collected via 20 discrete dip net sweeps on 24 April 1995. The Reference Site was located in the Suwannee River, 100 m upstream of the discharge, and the Test Site was located in the Suwannee River 100 m below the discharge.

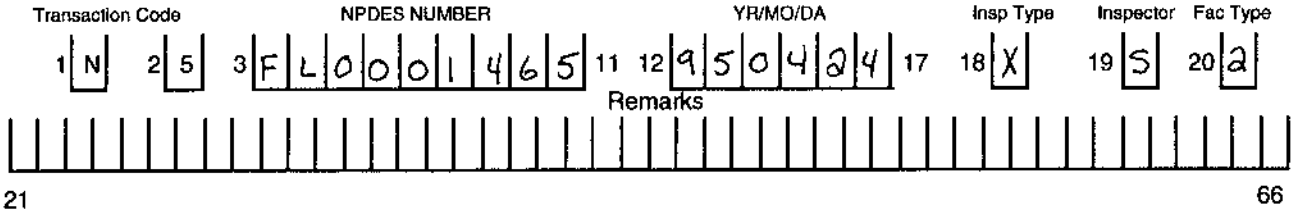
| | Reference Site | Test Site |
|---|---|---|
| **Oligochaeta** | | |
| *Nais simplex* | – | 33 |
| **Gastropoda** | | |
| *Campeloma limum* | 33 | – |
| *Micromenetus dilatatus* | 133 | – |
| *Physella* sp. | 33 | – |
| *Viviparus georgianus* | – | 33 |
| Ancylidae | 66 | 33 |
| Gastropoda | – | 33 |
| **Pelecypoda** | | |
| *Sphaerium striatinum* | 33 | – |
| Pisidiidae | 166 | 133 |
| **Acarina** | | |
| *Arrenurus* sp. | 66 | – |
| *Hygrobates* sp. | 33 | – |
| *Mideopsis* sp. | 133 | 66 |
| *Sperchon* sp. | 33 | – |
| Trombidiformes | 33 | – |
| **Isopoda** | | |
| *Caecidotea* sp. | 533 | 300 |
| **Amphipoda** | | |
| *Gammarus* sp. | – | 33 |
| *Hyalella azteca* | 200 | – |
| **Decapoda** | | |
| *Palaemonetes kadiakensis* | – | 33 |
| *Palaemonetes paludosus* | – | 33 |
| **Ephemeroptera** | | |
| *Baetis propinquus* | 33 | – |
| *Stenonema exiguum* | 100 | – |
| *Tricorythodes albilineatus* | 33 | – |
| Ephemeroptera | – | 33 |
| Heptageniidae | – | 200 |
| **Odonata** | | |
| *Gomphus geminatus* | 33 | – |
| Gomphidae | – | 33 |
| **Hemiptera** | | |
| Hemiptera | 33 | – |
| **Coleoptera** | | |
| *Dubiraphia* sp. | 100 | – |
| *Dubiraphia vittata* | 100 | – |
| *Microcylloepus pusillus* | – | 33 |
| *Peltodytes oppositus* | 33 | – |
| *Suphisellus* sp. | 33 | – |

| | | |
|---|---|---|
| *Stenelmis* sp. | 366 | 466 |
| **Trichoptera** | | |
| *Cheumatopsyche* sp. | – | 66 |
| *Hydropsyche* sp. | – | 200 |
| *Hydropsyche decalda* | 33 | – |
| *Hydroptila* sp. | 233 | – |
| Leptoceridae | – | 33 |
| *Nectopsyche* sp. | 33 | – |
| *Nectopsyche exquisita* | – | 33 |
| *Neotrichia* sp. | – | 100 |
| *Oecetis cinerascens* | – | 66 |
| *Oecetis parva* | 33 | – |
| *Triaenodes* sp. | 66 | – |
| Hydropsychidae | – | 33 |
| Hydroptilidae | 166 | – |
| **Diptera** | | |
| *Ablabesmyia mallochi* | 133 | 33 |
| *Ablabesmyia rhamphe* grp. | – | 33 |
| *Cladotanytarsus* sp. | – | 33 |
| *Hemerodromia* sp. | 66 | 33 |
| *Labrundinia* sp. | 33 | – |
| *Paralauterborniella nigrohalterale* | 33 | – |
| *Pentaneura inconspicua* | 33 | – |
| *Polypedilum convictum* grp. | 66 | 66 |
| *Polypedilum fallax* | – | 33 |
| *Polypedilum halterale* | 33 | – |
| *Polypedilum illinoense* | 33 | 33 |
| *Polypedilum scalaenum* grp. | 100 | – |
| *Rheotanytarsus* sp. | 33 | 33 |
| *Rheotanytarsus distinctissimus* grp. | 233 | 666 |
| *Rheotanytarsus exiguus* grp. | 966 | 700 |
| *Simulium* sp. | 33 | – |
| *Stenochironomus* sp. | – | 33 |
| *Stictochironomus devinctus* | 33 | – |
| *Tribelos jucundus* | 133 | 100 |
| *Tanytarsus* sp. | 33 | – |
| *Tanytarsus* sp. D Epler | 33 | – |
| *Tvetenia discoloripes* grp. | 66 | 100 |
| *Xenochironomus xenolabis* | 33 | 33 |
| *Xestochironomus subletti* | 33 | – |
| Chironomidae | 133 | 66 |
| Tipulidae | 33 | – |

Phytoplankton taxa list and densities (#/mL) for Gold Kist, Inc.–Poultry Division, collected via subsurface grabs on 24 April 1995. The Reference Site was located in the Suwannee River, 100 m upstream of the discharge, and the Test Site was located in the Suwannee River 100 m below the discharge.

| | Reference Site | Test Site |
|---|---|---|
| **Cyanophyceae** | | |
| *Aphanocapsa* sp. | 10 | – |
| *Dactylococcopsis* sp. | 31 | 10 |
| *Lyngbya* sp. | – | 31 |
| *Microcystis* sp. | – | 10 |
| **Bacillariophyceae** | | |
| *Achnanthes* sp. | 10 | – |
| *Anomoeneis* sp. | 10 | – |
| *Cyclotella* sp. | 21 | 10 |
| *Navicula* sp. | 10 | 21 |
| *Nitzschia* sp. | 10 | – |
| **Chlorophyceae** | | |
| *Carteria* sp. | 10 | – |
| *Chlamydomonas* sp. | – | 10 |
| *Pteromonas* sp. | – | 10 |
| *Pediastrum* sp. | – | 10 |
| *Spermatozoopsis* sp. | – | 21 |
| **Euglenophyceae** | | |
| *Trachelomonas* sp. | – | 10 |

**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)**

