

Biological Assessment of

Brittany Estates Mobile Home Park WWTP

Alachua County

NPDES #FL0040215

Sampled March 2000

September 2001

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:	Brittany Estates Mobile Home Park WWTP
County:	Alachua
NPDES Permit Number:	FL0040215
Permit Expiration:	November 20, 2005

Toxics Sampling Inspection (XSI)

Date Sampled: March 27, 2000

Results: Iron and zinc were detected in the effluent at levels that complied with Class III water quality standards. No organic constituents were detected in the effluent.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: March 27, 2000

Results: The effluent sample was not toxic to the fish *Cyprinella leedsi* or to the invertebrate *Ceriodaphnia dubia* during the 48-hour acute bioassays.

Impact Bioassessment Inspection (IBI)

Date Sampled: March 27, 2000

Results: The SCI scores, based on the qualitative dipnet samples, placed the control site with 29 points in the "excellent" category and the test site with 25 points in the "good" category. The qualitative Florida Index score for the control site was 11 and the test site score was 15, about a 36% increase at the test site. The Florida Index score for the quantitative sample showed a 144% increase from the control site (9 points) to the test site (22 points). The Shannon-Weaver Diversity Index increased 32% (3.14-4.15) from the control to the test site. This difference in diversity violates Class III water quality standards (Rule 62-302.530(11)Several periphyton community health measures were improved at the test site compared to the control site. However, the community shifted from a Diatom dominated assemblage at the control site to a Blue-Green Algae/Diatom co-dominated assemblage at the test site. This shift combined with nutrient enrichment and elevated un-ionized ammonia depressed algal density and reduced thescraper population at the test site.

Water Quality Inspection (WQI)

Date Sampled: March 27, 2000

Results: Dissolved oxygen values at the control site (4.4 mg/L) and test site (4.3 mg/L) were below the Class III water quality standard (Rule 62-302.530(31) FAC). Fecal coliforms at the control (1,200 counts/100ml) and test sites (2,300 counts/100ml) and total coliforms at the control (3,400 counts/100ml) and test sites (4700 counts/100ml) exceeded Class III Water Quality Standards (Rule 62-302.530(6) and (7) respectively). Effluent levels were in compliance with the permit limit and do not appear related to the elevated levels at the study sites. Algal growth potential increased 10 fold from the control site (3.6 mg dry wt/L) to the test site (36.3 mg dry wt/L). The test site level greatly exceeds the 5 mg dry wt/L "problem threshold" and appears to be the result of the facility's nutrient input to the test site. Effluent AGP was 32.3 mg dry wt/L. Nutrient levels for total phosphorus, ortho-phosphate, ammonia, and TKN, were all elevated at the test site compared to the control site. Un-ionized ammonia (0.018 mg/L) in the effluent was near toxic levels (0.02 mg/L) (USEPA 1999).

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

Introduction

The Brittany Estates Mobile Home Park, located in Alachua County Florida, operates a 0.06 MGD domestic wastewater treatment facility (see map in Appendix). This facility treats domestic wastewater with activated sludge, utilizing a lift station, six aeration basins, two secondary clarifiers, chlorination, and a polishing pond or direct discharge with dechlorination (see Facility Summary in Appendix). The effluent is continuously discharged into the Class III Little Hatchet Creek. The annual mean flow for the previous year was 0.021 MGD.

State permit limits for the effluent are listed in Table 1. A Florida Department of Environmental Protection (FDEP) review of the monthly operating reports from the facility indicates the facility is presently in compliance with the permit limits. Discharge Monitoring Reports (DMRs) list residual chlorine after dechlorination as <0.02 mg/L where the limit is <0.01 mg/L. However, <0.02 mg/L is the detection limit of the chlorine analyzer. The remaining DMRs results were consistent with the permit during the last year. Previously, there were nutrient violations due to algal growth in the polishing pond.

Methods

The purpose of this investigation was to determine the effects of the Brittany Estates wastewater discharge on Little Hatchet Creek. A comparative assessment of biological community health was made between the control site located approximately 60 meters upstream of the Point of Discharge (POD) in Little Hatchet Creek, and the test site, 60 meters downstream of the POD in Little Hatchet Creek. A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical and chemical data were collected at the effluent and both study sites. Effluent from Brittany Estates was analyzed for nutrients, metals, volatile organics, semivolatile organics, and pesticides. Data for this report were collected on March 27, 2000.

Acute toxicity bioassays were conducted on an effluent sample using the invertebrate *Ceriodaphnia dubia*, and the fish *Cyprinella leedsi*, as test organisms. Bacterial populations were analyzed for total and fecal coliforms.

Benthic macroinvertebrate communities were examined quantitatively and qualitatively at both study sites. Quantitative sampling was conducted with Hester-Dendy multiplate samplers incubated for 28 days. Qualitative sampling was collected by 20 discrete dip-net sweeps from available substrate types (snags, roots, leaf packs, etc.).

Quantitative sampling for periphyton was conducted by incubating glass microscope slides in a standard periphytometer for 28 days. Qualitative phytoplankton sampling was conducted by subsurface water bottle grabs. Chlorophyll *a* was determined for both phytoplankton and periphyton communities using laboratory spectrophotometer analyses. Algal growth potential (AGP) was measured via algal growth response of the test organism *Selenastrum capricornutum*. All field and laboratory methods for FDEP investigations are carried out following the Bureau of Laboratory's Standard Operating Procedures (SOP's), which may be reviewed at: http://www8.myflorida.com/environment/learn/science/laboratories/index.html.

The indicators that were used to determine the effect of the effluent on the macroinvertebrate and algal community health include: measures of community composition, functional feeding groups, habitat assessments, taxa richness; Ephemeroptera-Plecoptera-Trichoptera (EPT) Index, Florida Index, Stream Condition Index (SCI), and Shannon-Weaver Diversity Index. For a brief review of each of these measurements, see *Explanation of Measurements of Community Health* in the Appendix.

The following personnel were involved in this investigation: Patrick O'Connor, Chris Mason and Kathleen Gerard of the FDEP Northeast District and Central Biology and Chemistry Laboratory Staff. The Point Source Studies Review Committee consisted of Wayne Magley, Michael Tanski, Chuck Ziegmont, and District representatives.

Results and Discussion

Habitat assessment scores placed both the control and test sites in the "suboptimal" category with scores of 88 and 98 points, respectively.

Differences in the scores were due to higher substrate diversity, larger riparian buffer zone, and better vegetation quality in the buffer zone at the test site (see Habitat Assessment Sheets in Appendix).

Physical characteristics between the control and the test site were similar with the exception of conductivity (Table 1). Conductivity at the test site (362 µmhos/cm) was greater than the control site (256 µmhos/cm) and appears to be due to the elevated conductivity value of the effluent (557 µmhos/cm). Although somewhat elevated, the test site level complied with Class III water quality standards. Dissolved oxygen levels at the control (4.4 mg/L) and test sites (4.3 mg/L) were below the Class III standard of 5.0 mg/L (Rule 62-302.530(31) FAC). These values appear unrelated to the discharge.

Iron and zinc were detected in the effluent at levels that complied with Class III water quality standards (Table 1). No organic constituents were detected in the effluent.

The 48-hour acute bioassay test conducted on the effluent sample did not indicate acute toxicity either to the fish, *Cyprinella leedsi* or to the invertebrate,

Table 1. Effluent limits and summary of chemistry data.

Brittany Estates MHP WWTP	Effluent Limits	Effluent Samples	Control Site	Test Site
Organic Constituents (µg/L)				
None Detected	-	-	-	-
Metals (µg/L)				
Aluminum	≤ 1,500 **	180 U	-	-
Arsenic	≤50 **	4.0 U	-	-
Cadmium	≤ 1.4 **b	0.04 U	-	-
Chromium	≤ 250.0 **b	0.70 U	-	-
Copper	≤ 14.4 **b	2.5 U	-	-
Iron	≤ 1,000 **	51 I	-	-
Lead	≤ 4.3 **b	0.25 U	-	-
Nickel	≤ 191.7 **b	1.3 U	-	-
Selenium	≤ 5.0 **	1.2 U	-	-
Silver	≤ 0.07 **	0.03 U	-	-
Zinc	≤ 128.9 **b	40 I	-	-
Nutrients (mg/L)				
Ortho-phosphate	-	2.7	0.02	1.0
Total phosphorus	-	3.5 A	0.05	0.98
Ammonia	≤ 4.8 *	0.17 A	0.03	0.19
Un-ionized ammonia	≤ 0.02 **	0.02	-	-
Nitrate+Nitrite	-	1.3	0.02	0.17
Nitrate	≤12 *	-	-	-
TKN	-	1.4 AQ	0.41	0.8
Organic Nitrogen	≤6.4 *	1.23 c	0.38 c	0.61 c
Total Nitrogen	-	2.7 c	0.43 c	0.97 c
General Phys-Chem Parameters				
Habitat Assessment	-	-	88	98
DO (mg/L)	> 6.0 *	6.7	4.4	4.3
pH (SU)	6.0-8.5 *	6.8	6.9	7.0
Conductivity (µmhos/cm)	-	557	256	362
Temperature (°C)	-	21.56	19.7	20.1
CBOD, 5 day (mg/L)	≤ 16 *	4	2 K	2 K
TSS	≤ 60 *	3	2	2
Flow (MGD)	0.06	0.021 a	-	-
Hardness (mg $CaCO_3$)	-	125.9	-	-
AGP (mg dry wt/L)	-	32.3	3.6	36.3
Toxicity (48-hour static, screening bioassay)				
Bioassay - Fish	NOEC	Not Toxic	-	-
Bioassay - Invertebrate	NOEC	Not Toxic	-	-
Microbiology (# counts/100ml)				
Fecal Coliforms	≤ 800 *	50 B	1,200 B	2,300
Total Coliforms	≤ 2,400 **	780	3,400	4,700

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range
I - Value is < the MQL, and ≥ the MDL
K - Actual value is known to be less than value given
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value is the MDL
NOEC - A no observed effect concentration < 100% constitute a violation of this permit
* Permit limit
** Class III WQS
a - Annual average
b - Value is hardness based
c - Value is calculated

Ceriodaphnia dubia using a 100% effluent sample (see Bioassay Data Sheets in Appendix)

Fecal and total coliforms at the control site (1,200 counts/100ml and 3,400 counts/100ml, respectively) and test site (2,300 counts/100ml and 4,700 counts/100ml, respectively) violated Class III water quality standards (Rules 62-302.530(6) and (7) FAC, respectively). The effluent fecal (50 counts/100 ml) and total coliform levels (780 counts/100 ml) complied with the permit limit and Class III standards and do not appear responsible for the elevated levels measured at the receiving water sites (Table 1).

Nutrient concentrations were greater at the test site than at the control site (Table 1). At the test site, total phosphorus (0.98 mg/L) and ortho-phosphate (1.0 mg/L) were higher than 90% of other typical Florida streams (see *Typical Values for Selected Parameters in Florida Waters*). The nitrate+nitrite concentration increased from 0.02 mg/L at the control site to 0.17 mg/L at the test site. Ammonia was 0.03 mg/L at the control site but increased substantially at the test site (0.19 mg/L). Effluent un-ionized ammonia (0.02 mg/L) violated Class III water quality standards (Rule 62-302.530(3) FAC). TKN at the test site (0.80 mg/L) was also higher than the control site (0.41 mg/L). Effluent levels of total phosphorus (3.5 mg/L), ortho-phosphate (2.7 mg/L), nitrate+nitrite (1.3 mg/L), TKN (1.4 mg/L), and ammonia (0.17 mg/L) appear responsible for the increases measured at the test site. AGP comparisons between the control and test site indicated eutrophication in Little Hatchet Creek at the test site (Table 1).

AGP increased an order of magnitude from 3.6 mg dry wt/L at the control site to 36.3 mg dry wt/L at the test site. The test site AGP value greatly exceeded the 5 mg dry wt/L "problem

Table 2. Community structure of control and test sites.

Brittany Estates MHP WWTP	Control Site	Test Site
Periphyton Algae		
Number of Taxa	15	19
Shannon-Weaver Diversity Index	2.73	3.72
Chlorophyll *a* (mg/m2)	5.8 A	0.43 U
Algal Density (#/cm2)	130,390	76,985
Diatom/Diatom + B-G Ratio	0.9	0.49
%Blue-green	8.7	44.6
% Diatoms	84.8	45.8
Phytoplankton Algae		
Number of Taxa	34	35
Shannon-Weaver diversity	4.3	4.3
Chlorophyll *a* (µg/L)	1.0 U	1.0 U
Algal Density (#/mL)	258	260
% Blue-green	30.3	22.1
% Green	14.8	12.1
% Diatoms	45.1	52.2
AGP (mg dry wt/L)	3.6	36.3

A - Mean of two or more determinations
U - Undetected

threshold" (Raschke and Shultz 1987). The effluent AGP value was 32.3 mg dry wt/L.

The level of un-ionized ammonia in the effluent (0.02mg/L) may have produced a slight toxic effect near the point of discharge from the effluent that dilutes quickly downstream. Periphyton algal densities were depressed at the test site (76,985/cm²) compared to the control site (130,390/cm²) despite nutrient enrichment from the discharge. Test site chlorophyll *a* (0.4 mg/m²) decreased by 93% relative to the control site chlorophyll *a* value (5.8 mg/m²) (Table 2). The community shifted from one dominated by diatoms at the control site (85% diatom and 9% blue-green algae) to a diatom/blue-green algae co-dominated assemblage (46% diatom and 45% blue-green algae) at the test site. The dominant taxon at the control site was the diatom *Cocconeis placentula*, this species has both pollution-sensitive and tolerant varieties. The test site was dominated by the pollution-tolerant blue-green algae *Lyngbya* sp. (see Periphyton Taxa Lists in Appendix). Perhaps in response to the elevated nutrients, the number of algal taxa increased 27% from the control site (15 taxa) to the test site (19 taxa), and there was a 36% increase in the Shannon-Weaver diversity index from 2.73 at the control site to 3.72 at the test site.

These results suggest that an impact is being exerted on the periphyton community at the test site. The periphyton species appear to be affected by the combined effects of nutrient enrichment and high levels of un-ionized ammonia resulting in decreases in algal density and a shift from a diatom dominated assemblage to a blue-green algae/diatom co-dominated assemblage.

The phytoplankton community did not appear to be influenced by the effluent discharge. The dominant phytoplankton taxon at both the control site and the test site was the blue-green algae *Oscillatoria* sp. (see Taxa Lists in Appendix). Number of taxa, Shannon-Weaver diversity, chlorophyll *a* density, and algal density were all similar or equal between the control and test sites (Table 2).

With the exception of an 11% increase in the pollution-tolerant Oligochaetes at the test site compared to the control site, the quantitative Hester-Dendy samplers showed no real indication of impairment (Table 3). Most of the quantitative community health measures were better at the test site compared to the control site. For example, taxa richness increased from 20 taxa to 49 taxa and the Florida Index score increased from 9 points to 22 points at the test site compared to the control site (Table 3). The Shannon-Weaver Diversity Index increased 32% from 3.14 to 4.15 from the control to the test sites. The dominant taxon at both the control and test site was the Dipteran, *Chironomus* sp., a pollution-tolerant taxa (see Taxa Lists in Appendix).

Several of the qualitative community measures also showed improvement at the test site compared to the control site (Table 3). The number of taxa increased 39% at the test site compared to the control site and the Florida Index increased from 11 points to 15 points. Percent contribution of the dominant taxon decreased from 25.4% at the control to 16.5% at the test site. The composite SCI score decreased from "excellent" (29 points) at the control site to "good" (25 points) at the test site (see SCI worksheet in Appendix). However, there was a minor shift towards a nutrient-tolerant macroinvertebrate community at the test site as seen by an increase in the proportion of the pollution-tolerant Dipterans and a decrease in the pollution-sensitive suspension-feeders at the test site compared to the control site. The dominant taxa were the ancylid Gastropods at the control site and the pollution-tolerant Dipteran, *Chironomus* sp., at the test site (see Taxa Lists in Appendix).

In conclusion, Little Hatchet Creek showed increased nutrients and a similar or slightly improved biological community currently improved downstream of the discharge. However, data from the

Table 3. Community structure of control and test sites.

Brittany Estates MHP WWTP	Control Site	Test Site
Macroinvertebrate Dipnet (Qualitative)		
% Dominant Taxon	25.4	16.5
EPT Index	0	1
Florida Index	11	15
Number of Taxa	28	39
SCI	29	25
Community Composition		
% Coleoptera	3.9	3.8
% Diptera	50.0	69.8
% Gastropoda	26.9	9.9
% Odonata	3.9	0.9
% Oligochaeta	0.8	2.8
% Pelecypoda	8.5	4.3
% Trichoptera	0.0	3.8
% Other	3.9	4.7
Functional Feeding Groups		
% Predators	18.1	20.8
% Surface Deposit Feeders	31.9	42.0
% Burrower Deposit Feeders	0.8	2.8
% Suspension Feeders	15.4	11.6
% Scrapers	28.5	11.1
% Shredders	3.1	8.0
Macroinvertebrate Hester-Dendy (Quantitative)		
% Dominant Taxon	25.7	28.7
EPT Index	0	1
Florida Index	9	22
Number of Taxa	20	49
Shannon-Weaver Diversity	3.14	4.15
Community Composition		
% Coleoptera	0.6	0.5
% Diptera	73.2	70.1
% Oligochaeta	4.4	15.2
% Gastropoda	20.2	4.4
% Trichoptera	0.0	2.2
Functional Feeding Groups		
% Predators	12.2	19.3
% Surface Deposit Feeders	49.3	47.2
% Burrower Deposit Feeders	4.4	12.3
% Suspension Feeders	8.7	9.0
% Scrapers	20.8	4.1
% Shredders	2.5	4.0

community composition measures suggest a slight shift towards more nutrient-tolerant organisms downstream of the discharge as seen by the increases in Oligochaetes and Dipterans and a decrease in the filter-feeding Pelecypods.

Literature Cited

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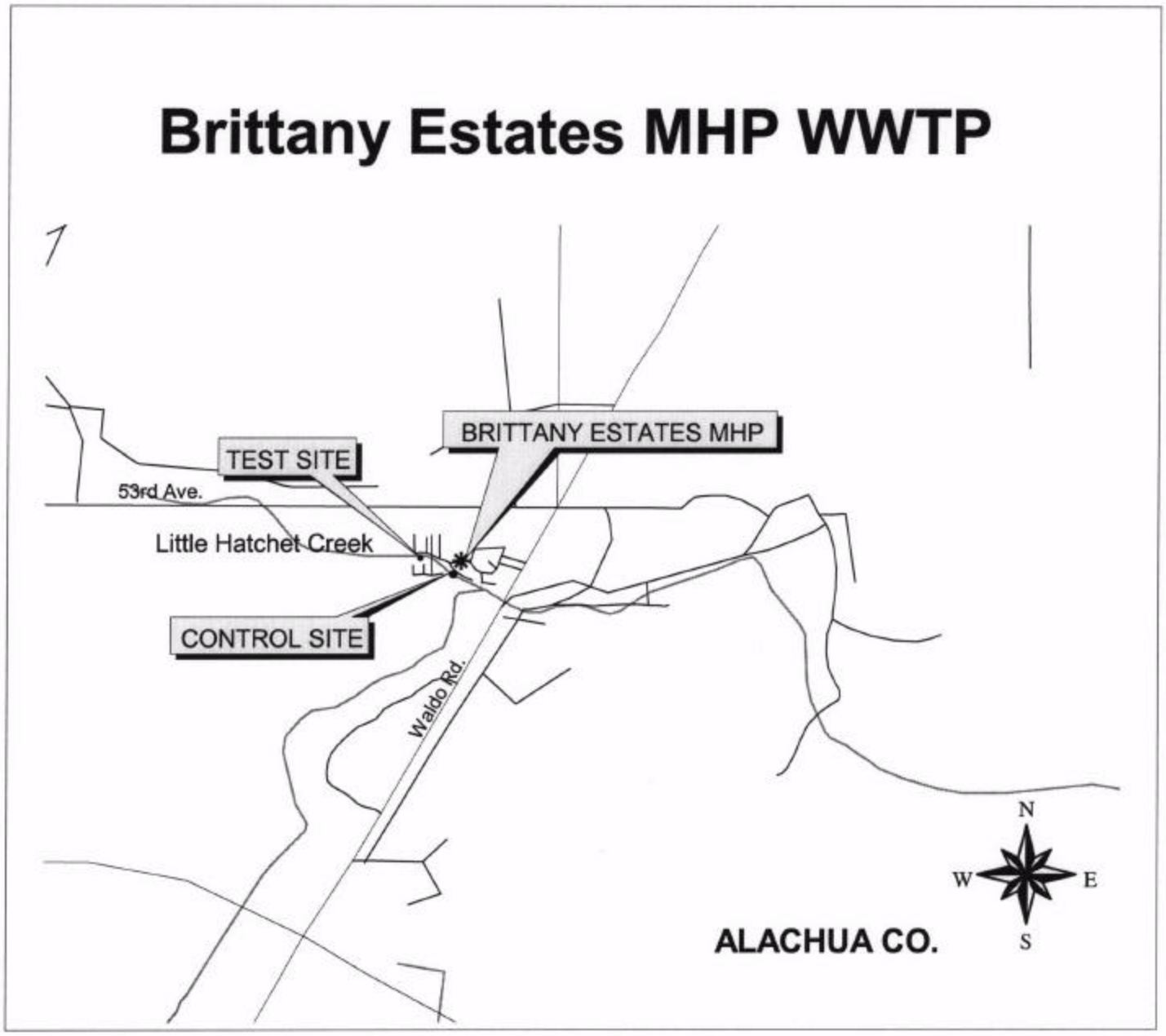
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Brittany Estates MHP WWTP





0 400 800 1200 1600 Meters

FDEP - Bureau of Labs
Fifth Year Inspection
Created by: Julie Riley
Sept. 21, 2001

Typical Values for Selected Parameters in Florida Waters

Brittany Estates — **Percentile Distribution STREAMS** — (1617 stations)

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Control Site												
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	**3.14**
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	**28**
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	**20**
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	**1.0**
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	**5.8**
TKN	0.30	**0.39**	**0.56**	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.41**
Ammonia	0.02	**0.02**	**0.04**	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.03**
NO2-NO3	0.01	**0.01**	**0.03**	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05	**0.02**
Total Phosphorus	0.02	0.03	**0.05**	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**0.05**
Ortho Phosphate	0.01	**0.01**	**0.03**	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**0.02**
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	-
Test Site												
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**	**4.15**
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**	**39**
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**	**49**
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	**1.0**
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	**0.43**
TKN	0.30	0.39	0.56	**0.73**	**0.87**	1.00	1.11	1.26	1.49	1.93	2.80	**0.8**
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	**0.14**	**0.20**	0.34	0.60	**0.19**
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	**0.14**	**0.20**	0.32	0.64	1.05	**0.17**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	**0.74**	**1.51**	**0.98**
Ortho Phosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	**0.59**	**1.37**	**1.0**
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	-

Units: Phytoplankton Chlorophyll *a* (µg/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates. A percentile rank increase for parameters above the bold line indicates healthy conditions. A percentile rank increase for parameters below the bold line indicates unhealthy conditions (Adapted from Joe Hand, FDER, personal communication, 1991. Data was collected between 1980 and 1989).

Explanation of Measurements of Community Health

Different measurements of macroinvertebrate and algal community health are used to determine the biotic effects of a discharge. The measurements are briefly discussed here, (**MN**, marine, **FW**, freshwater).

MN/FW Taxa richness: Environmental stressors tend 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.

MN/FW Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable representing 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 that is also associated with disturbance.

MN/FW Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. Species sensitivity data from other sources, such as Chang *et al.* (1992), Farrell (1992), Hudson *et al.* (1990), Hulbert (1990), Lenat (1993), and Whitmore (1989), are used as appropriate.

MN/FW Community structure: Substantial shifts in proportions of major groups of organisms, compared to control 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.

MN/FW Functional feeding groups/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).

MN/FW Algal Growth Potential: Evaluates nutrient conditions based on the premise that "maximum yield is proportional to the amount of a nutrient available" (RL Raschke and Schultz, 1987) using *Duniella tertiolecta* for marine water systems and *Selenastrum capricornutum* Printz for freshwater systems.

MN/FW 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) often indicates nutrient enriched conditions in flowing streams.

FW Habitat Assessment: Seven attributes known to have potential effects on the stream biota were scored, with 20 possible points for each factor. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (160-129 points), Suboptimal (128-86 points), Marginal (85-49 points), and Poor (48-0 points).

FW The Florida Index: Some organisms become rare or absent as the intensity or duration of disturbance increases. This index, assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A high Florida Index score is considered healthy.

FW Ephemeroptera-Plecoptera-Trichoptera (EPT) Index: This index sums the number of EPT taxa present. Higher EPT values are associated with healthier systems.

FW Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric developed for Florida (Barbour *et al.* 1996). This index assigns points to a variety of parameters, depending on how closely each parameter approaches an expected control condition (see SCI calculation table in Appendix).

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name:	Date Summary Prepared :
Brittany Estates Mobile Home Park WWTF	May 17, 2000

Location (attach detailed map):	County	District
5010 Northeast Waldo Road Gainesville, Florida	Alachua	Northeast District

Federal Permit # and expiration date:	State GMS # and State expiration date:	Facility Type: Industrial Municipal Federal Agricultural Other (list): Private.
FL0040215	(3101P03378)	

Function of facility:
Wastewater Treatment Facility.

Description of treatment process:
The Facility is permitted as a 0.06 MGD activated sludge plant capable of operating in the extended aeration mode for average daily flows less than 0.03 MGD or the contact stabilization mode for average daily flows up to 0.06 MGD. This facility includes a lift station, six aeration basins, two secondary clarifiers, chlorination, and a polishing pond or direct discharge with dechlorination to Little Hatchet Creek.

Receiving waters:	Classification: I II (III)
Little Hatchet Creek	

Design Flow:	Mean Flow:	Flow during survey:
0.06 MGD.	0.021 annual avg.	

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

therefore, the best time to sample is: morning hours 7AM → 11:00 AM.

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

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

Parameter	Limit (units)			
	Annual	Monthly	Weekly	Single
CBOD5 (mg/L)	8	10	12	16
TSS (mg/L)	20	30	45	60
Ammonia (mg/L)	2.4	3.0	3.6	4.8
Organic N (mg/L)	3.2	4.0	4.8	6.4
Nitrate (mg/L)				12
Dissolved Oxygen (mg/L)	(minimum)			6.0
Fecal coliforms (no./100mL)	200	200		800
Chlorine	minimum			0.5
	maximum			0.01

Describe special permit conditions and permit modifications:
See attached pages of permit.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Brittany Estates MHP WWTF (Facility)

FACILITY SUMMARY

Description of permitted outfall(s):

Ditch to Little Hatchet Creek.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year:

DMRs lists chlorine residual after dechlorination as <0.02 mg/l. where limit is <.01 mg/l. However, this may be detection limit of operator's chlorine analyser. the remainder of sampling results that are recorded on the DMRs are consistent with the permit during the last year. Previously, there were nutrient violations due to algae growth in the polishing pond according to their engineer.

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

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

Results are consistent.

Additional information:

Plant discharge was dechlorinated and was discharged directly into a ditch to little Hatchet Creek. the facility also has capability to discharge into a polishing pond for dechlorination and then to the ditch to little Hatchet Creek.

See attached map.

Staff contributing to this review (signature):

(Biologist)

(Inspector)

Kathleen M Howard (Engineer)

( )

( )

( )

Department of Environmental Protection

Lawton Chiles
Governor

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Virginia B. Wetherell
Secretary

STATE OF FLORIDA
DOMESTIC WASTEWATER FACILITY PERMIT

PERMITTEE:
Rissman Investment Co.
21415 Civic Center Drive #303
Southfield, Michigan 48076

PERMIT NUMBER: **FL0040215(3101P03378)**
ISSUANCE DATE: **December 4, 1995**
EXPIRATION DATE: **December 4, 2000**
APPLICATION No.: **273088**

Revised April 23, 1997

RESPONSIBLE AUTHORITY:
Mr. Robert Rissman, President

FACILITY:

Brittany Estates Mobile Home Park WWTF
5010 Northeast Waldo Road
Alachua County
Gainesville, Florida 32601

Latitude: 29°42' 00"N Longitude: 82°16'54"W

This permit is issued under the provisions of Chapter 403, Florida Statutes, and applicable rules of the Florida Administrative Code and constitutes authorization to discharge to waters of the state under the National Pollutant Discharge Elimination System. The above named permittee is hereby authorized to operate the facilities shown on the application and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

TREATMENT FACILITIES:

A 0.06 MGD annual average daily flow AADF activated sludge wastewater treatment facility capable of operating in the extended aeration mode for average daily flows less than 0.03 MGD AADF or the contact stabilization mode for average daily wastewater flows up to 0.06 MGD AADF. The wastewater treatment facility includes an influent pumping station, multiple (six 5000 gallon) aeration basins, two secondary clarifiers, a chlorine contact chamber with hypochlorination disinfection system and a polishing pond/dechlorination system. Domestic wastewater residuals are stored and thickend in a sludge holding tank and disposed of by Florida Septic, Inc. of Hawthorne. The facility is also approved to dishcarge final effluent from the polishing pond by-pass facilities. These by-pass facilities include a separate chlorination/dechlorination system, and post aeration system.

EFFLUENT DISPOSAL:

Surface Water Discharge: An existing 0.06 MGD AADF permitted to discharge following post aeration to Little Hatchet Creek (Class III waters) at Latitude: 29°42' 00"N, Longitude: 82°16'54"W from outfall (D001).

IN ACCORDANCE WITH: The application received on June 23, 1995 and additional information received through July 21, 1995 and the limitations, monitoring requirements and other conditions set forth in Pages 1 through 15 this permit.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

PERMITTEE:
Rissman Investment Co.
21415 Civic Center Drive #303
Southfield, Michigan 48076

PERMIT NUMBER: FL0040215(3101P03378)
ISSUANCE DATE: December 4, 1995
EXPIRATION DATE: December 4, 2000
APPLICATION No.: 273088

I. Effluent Limitations and Monitoring Requirements

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D001 to Little Hatchet Creek. Such discharge shall be limited and monitored by the permittee as specified below:

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	Maximum	8.0	10.0	12.0	16.0	Every two weeks	Grab	D001	
Total Suspended Solids	mg/L	Maximum	20	30	45	60	Every two weeks	Grab	D001	
Fecal Coliform Bacteria	See Permit Condition I. A. 3.						Every two weeks	Grab	I002	
pH	std. units	Range	-	-	-	6.0 to 8.5	Daily, 5/Week	Grab	D001	
Total Residual Chlorine (For Disinfection)	mg/L	Minimum	-	-	-	0.5	Daily, 5/Week	Grab	I002	See I.A.4. & I.A.7.
Total Residual Chlorine (For Dechlorination)	mg/L	Maximum	-	-	-	0.01	Every two weeks	Grab	D001	See I.A.7.
Ammonia as N	mg/L	Maximum	2.4	3.0	3.6	4.8	Every two weeks	Grab	D001	
Organic N	mg/L	Maximum	3.2	4.0	4.8	6.4	Every two weeks	Grab	D001	
Nitrate as N	mg/L	Maximum	-	-	-	12.0	Every two weeks	Grab	I002	
Dissolved Oxygen	mg/L	Minimum	-	-	-	6.0	Daily, 5/Week	Grab	D001	See I.A.7.
Whole Effluent Toxicity	See Permit Condition I.A.6. & I.A.7.									

2. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I. A. 1. and as described below:

Monitoring Location Site Number	Description of Monitoring Location
I002	Discharge from Chlorine Contact Chamber prior to polishing pond (dechlorination)
D001	Final WWTF discharge following post aeration

3. The arithmetic mean of the monthly fecal coliform values collected during an annual period shall not exceed 200 per 100 mL of effluent sample. The geometric mean of the fecal coliform values for a minimum of 10 samples of effluent each collected on a separate day during a period of 30 consecutive days (monthly), shall not exceed 200 per 100 mL of sample. No more than 10 percent of the samples collected during a period of 30 consecutive days shall exceed 400 fecal coliform values per 100 mL of sample. Any one sample shall not exceed 800 fecal coliform values per 100 mL of sample. *[62-600.440(4)(c), 6-8-93]*

4. A minimum of 0.5 mg/L total residual chlorine must be maintained for a minimum contact time of 15 minutes based on peak hourly flow. *[62-600.440(4)(b), 6-8-93]*

5. Florida water quality criteria and standards shall not be violated as a result of the discharge. *[Chapter 62-600.500, 6-8-93]*

6. An LC_{50} of 100% or less in a test of 96 hours duration or less will constitute a violation of Florida Administrative Code (FAC) and the terms of this permit. The testing for this requirement must conform with Permit Condition I.A.7. of this permit. *[62-4.244(3)(a) , 4-30-95]*

7. The Permittee shall conduct whole effluent toxicity testing of the discharge from outfall D001 following endothall-based algaecide addition to the polishing pond in accordance with the testing requirements described below. All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring the Acute Toxicity of reclaimed waters to Freshwater and Marine Organisms, EPA/600/4-90/027F, or the most current edition. The dilution control water used will be moderately hard water as described in EPA/600/4-90/027F, Section 7, or the most current edition. A standard reference toxicant quality assurance test shall be conducted concurrently with each species used in the toxicity tests and the results submitted with the Discharge Monitoring Report (DMR). Alternatively, if monthly QA/QC reference toxicant tests are conducted, these results must be submitted with the DMR.

   a. The Permittee shall conduct 96-hour acute static renewal multi-concentration toxicity tests using the Ceriodaphnia dubia (water flea) and the Cyprinella leedsi (bannerfin shiner) whenever the endothall-based algaecide is applied for any reason AND a discharge occurs during or within five (5) calendar days of the application. A grab sample must be collected within one (1) hour of commencement of discharge and used in the 96-hour acute static-renewal multi-concentration toxicity test described below. All tests will be conducted on a single grab sample consisting of a control (0%) and the following dilution concentrations at a minimum: 100.0%, 50.0%, 25.0%, 12.5%, and 6.25%. Results of the tests are not to be combined or averaged, but reported separately.

   b. If control mortality exceeds 10% for either species in any test, the test(s) for that species (including the control) shall be repeated. A test will be considered valid only if control mortality does not exceed 10% for either species. If, in any grab sample test, 100% mortality occurs prior to the end of the test, and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the sample demonstrates unacceptable acute toxicity. The Department reserves the right to require additional whole effluent toxicity tests be conducted if the sample demonstrates unacceptable acute toxicity and

to modify this permit if necessary to include provisions to ensure the effluent discharged from the pond following the addition of the endothall-based algaecide is adequately controlled and non-toxic.

c. The toxicity tests specified above are referred to as "routine tests" and shall be conducted. If there is no discharge during the monthly reporting period, OR if the algaecide is not applied within that reporting period (regardless of discharge), no toxicity testing is required, unless notified otherwise by the Department.

d. Results from "routine" tests shall be reported according to EPA/600/4-85/013, Section 13, Report Preparation (or the most current edition), and shall be submitted as an attachment to the DMR.

[62-302.500(1)(d) FAC]

7. Field Testing, sample collection and preservation, laboratory testing, including quality control procedures, and all record keeping shall comply with Chapter 62-160, FAC. Compliance of reported results shall be in accordance with Rule 62-4.246, FAC. Each effluent parameter has an applicable method detection limit (MDL) and a practical quantitative limit (PQL) as follows:

ANALYTE	RECOMMENDED	MDL	TARGET PQL	EPA METHOD
Dissolved Oxygen	100.0		500.0	360.1 or 360.2
Total chlorine residual	10.0 200.0		10.0 200.0	330.1 or 330.5

Units are microgram per liter
Equivalent methods are subject to approval by the Department

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	20020099	3/27/00	1430	NEWNANS LAKE

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
	ALACHUA	Little Hatchet CREEK 60 m BELOW Bethany Estates POD	TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (speci

Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☐ Obvious sources

Width of riparian vegetation (m) on least buffered side: 10m

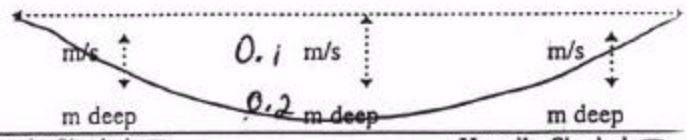
List & map dominant vegetation on back

Artificially Channelized ☐ NO Artificially Impounded ☐ YES — none

High Water Mark: 0.6 + 0.2 = 0.8 (m above present water level) (present depth in m) (m above bed)

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

1-1.5 m wide



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 Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	3	5	DIPNET	Sand	90	5	DIPNET
Leaf Packs or Mats	5	5	DIPNET	Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	2	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):	Time		Secchi (m
Top								
Mid-depth	0.1	20.13	6.99	4.27	362	1430		0.2
Bottom								

System Type: Stream: ☒ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☒ Slightly Turbid: ☐ Turbid: ☐ Opaque: ☐

Color: Tannic: ☒ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:

P/C Worm Rain Previous DAY

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

Sampling Team: MASON, O'CONNOR

Signature: Patrick Mason

Date: 3/27/

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:
	20020098	3/27/00	NEWNANS LAKE

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	ALACHUA	Little Hatchet Creek 60M ABOVE Bethany Estates POD	Control Site

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 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 [11]	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 [10]	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 [13]	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 [42]				
Secondary Habitat Components **Artificial Channelization** [9]	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 [8] Left Bank [7]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank [3] Left Bank [5]	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 [7] Left Bank [7]	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 [46]				

[88] TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
3/27/00	O'CONNOR	Patrick O'Connor

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	20020098	3/27/00	1250	NEWNANS LAKE

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
	ALACHUA	Little Hatchet Creek 60m Above Bellamy Estates POD	Control Site

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (speci

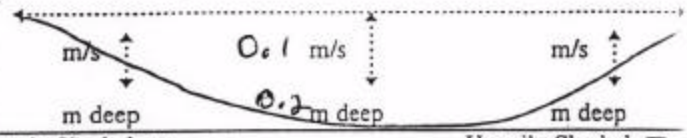
Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☐ Obvious sources

Width of riparian vegetation (m) on least buffered side: 4

List & map dominant vegetation on back

Typical Width (m)/Depth (m)/Velocity (m/sec) Transect
0.5-1.0 m wide



Artificially Channelized ☐ NO Artificially Impounded ☐ YES

none (yes)

High Water Mark: 0.6 + 0.2 = 0.8
(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 Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	2	7	Dipnet	Sand	86	6	Dipnet
Leaf Packs or Mats	14	7		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):	Time		Secchi (m
Top								
Mid-depth	0.1	19.68	6.9	4.39	256	1250		0.2
Bottom								

System Type: Stream: ☒ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☑ Slightly Turbid: ☐ Turbid: ☐ Opaque: ☐

Color: Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:
RAIN T Storms Previous Day

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

Sampling Team: MASON, O'CONNOR

Signature: Robert Mason

Date: 3/27

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:
	20020099	3/27/00	NEWNANS LAKE

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Alachua	Little Hatchet Creek 600 m below Bethany Estates Rd	TEST Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components				
Substrate Diversity [13]	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 [8]	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 [10]	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 [8]	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 [39]				
Secondary Habitat Components				
Artificial Channelization [8]	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	Stable. No evidence of erosion or bank failure. Little potential for future problems.	Moderately stable. Infrequent or small areas of erosion, mostly healed over.	Moderately unstable. Moderate areas of erosion, high erosion potential during floods.	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing.
Right Bank [8]	10 9	8 7 6	5 4	3 2 1
Left Bank [8]				
Riparian Buffer Zone Width	Width of native vegetation (least buffered side) greater than 18 m	Width of native vegetation (least buffered side) 12 m to 18 m	Width of native vegetation 6 to 12 m, human activities still close to system	Less than 6 m of native buffer zone due to intensive human activities
Right Bank [5]	10 9	8 7 6	5 4	3 2 1
Left Bank [10]				
Riparian Zone Vegetation Quality	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.	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.	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.	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.
Right Bank [10]				
Left Bank [10]				
Secondary Score [59]	10 9	8 7 6	5 4	3 2 1

[98] TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
3/27/00	O'Connor	Robin O'Connor

Typical Values for Selected Parameters in Florida Waters

Brittany Estates **Percentile Distribution STREAMS** (1617 stations)

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Control Site												
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	**3.14**
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	**28**
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	**20**
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	**1.0**
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	**5.8**
TKN	0.30	**0.39**	**0.56**	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.41**
Ammonia	0.02	**0.02**	**0.04**	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.03**
NO2-NO3	0.01	**0.01**	**0.03**	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05	**0.02**
Total Phosphorus	0.02	0.03	**0.05**	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**0.05**
Ortho Phosphate	0.01	**0.01**	**0.03**	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**0.02**
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	-
Test Site												
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**	**4.15**
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**	**39**
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**	**49**
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	**1.0**
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	**0.43**
TKN	0.30	0.39	0.56	**0.73**	**0.87**	1.00	1.11	1.26	1.49	1.93	2.80	**0.8**
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	**0.14**	**0.20**	0.34	0.60	**0.19**
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	**0.14**	**0.20**	0.32	0.64	1.05	**0.17**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	**0.74**	**1.51**	**0.98**
Ortho Phosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	**0.59**	**1.37**	**1.0**
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	-

Units: Phytoplankton Chlorophyll *a* (µg/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates. A percentile rank increase for parameters above the bold line indicates healthy conditions. A percentile rank increase for parameters below the bold line indicates unhealthy conditions (Adapted from Joe Hand, FDER, personal communication, 1991. Data was collected between 1980 and 1989).

Brittany Estates Mobile Home Park WWTP - Stream Condition Index

Control Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	**28**	≥27	26-14	<14	**5**
EPT Index	**0**	≥4	3-2	<2	**1**
# Chironomid Taxa	**12**	≥9	8-5	<5	**5**
% Contribution of Dominant Taxon	**25.4**	≤30	31-65	>65	**5**
% Diptera	**50.0**	-	≤52	>52	**3**
Florida Index	**11**	≥10	9-5	<5	**5**
% Suspension feeders/Filterers	**15.4**	≥15	14-8	<8	**5**
Total Score		**Peninsula**			**29**
Interpretation of Scores		**Excellent**			**27-33**
		Good			21-26
		Poor			14-20
		Severely Degraded			7-13

Test Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	**39**	≥27	26-14	<14	**5**
EPT Index	**1**	≥4	3-2	<2	**1**
# Chironomid Taxa	**16**	≥9	8-5	<5	**5**
% Contribution of Dominant Taxon	**16.5**	≤30	31-65	>65	**5**
% Diptera	**69.8**	-	≤52	>52	**1**
Florida Index	**15**	≥10	9-5	<5	**5**
% Suspension feeders/Filterers	**11.6**	≥15	14-8	<8	**3**
Total Score		**Peninsula**			**25**
Interpretation of Scores		Excellent			27-33
		Good			**21-26**
		Poor			14-20
		Severely Degraded			7-13

Winter Index Period: Stream Condition Index (SCI) for Florida Peninsula (April 1996)

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Brittany Estates Effluent
County: HILLSBOROUGH
Contact / District: Lee Banks / Jeff Martin / NE-D1ST
NPDES Permit #: FL00 40215
LIMS Sample #: 443939 (4/7/00) LIMS Job #: TLH-2000-03-29-34

Sample Collection: Date 3/27/00 Time 1215
Test Beginning: Date 3/28/00 Time 1325
Test Ending: Date 3/30/00 Time 1350
Organism Batch #: #15 Diluent Batch #: DMW#9
Organism Age: 24hrs. SRT toxicant batch #: —
Test organism: C. dubia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 1 of 2
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) 0 hr	24 h	48 h
CONT.	A	5	5	5	8.4	—	8.2	25.1	—	24.7	7.3	—	7.8	160	—	220
	B	5	5	5	—	—	8.3	—	—	24.5	—	—	7.8	—	—	210
	C	5	5	5	—	—	8.4	—	—	24.5	—	—	7.9	—	—	200
	D	5	5	5	—	—	8.4	—	—	24.4	—	—	7.9	—	—	215
100%	A	5	5	5	7.5	—	8.1	25.6	—	24.4	7.5	—	7.9	455	—	600
	B	5	5	5	—	—	8.1	—	—	24.4	—	—	7.9	—	—	615
	C	5	5	5	—	—	8.1	—	—	24.3	—	—	7.9	—	—	620
	D	5	5	5	—	—	8.2	—	—	24.3	—	—	7.9	—	—	665
measured by:		SG	DPH	SG	DPH	—	SG	DPH	—	SG	DPH	—	SG	DPH	—	SG
recorded by:		KL	DPH	SG	KL	—	KL	KL	—	KL	KL	—	KL	KL	—	KL

Investigators' Signatures

Temperature Range °C
Incubator # 2 25.5° – 26.5°C
Room B246 25.5° – 27.5°C

Water Quality Parameters	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	<0.03	DR100	DPH/KL	SG
Alkalinity (mg/L as $CaCO_3$):		76	60	Hach	KL/SG	SG
Hardness (mg/L as $CaCO_3$):		92	149	Hach	KL/SG	SG
Total ammonia (mg/L as N):		<0.017	0.235	Denver	DPH/KL	SG
Salinity:		0	0	Ysi	DPH/KL	SG

reviewer

form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Brittany Estates Effluent
County: ALACHUA
Contact / District: ~~Tom~~ Jacks, Lee Banks/Jeff Martin/NE
NPDES Permit #: FL00 40215
LIMS Sample #: 443939 LIMS Job #: TLH-2000-03-29-34
sample log 4/7/00

Sample Collection: Date 3/27/00 Time 1215
Test Beginning: Date 3/28/00 Time 1325
Test Ending: Date 3/30/00 Time 1350
Organism Batch #: 22 Diluent Batch #: Well
Organism Age: 11 days SRT toxicant batch #: —
Test organism: C. leedsi

Remarks:

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 2 of 2

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
CONT. A	B1	5	5	5	7.8	8.2	8.5	25.8	25.6	25.7	7.3	7.6	7.6	290	270	280
B	B2	5	5	5	8.0	8.4	8.5	25.8	25.3	24.6	7.4	7.6	7.6	260	260	265
C	B3	5	5	5	8.0	8.4	8.5	25.8	25.0	24.8	7.4	7.7	7.6	260	260	265
D	B4	5	5	5	8.0	8.3	8.5	25.8	25.0	25.7	7.4	8.0	7.7	260	265	275
100% A	B5	5	5	5	7.4	7.8	7.9	25.3	24.9	24.1	7.3	7.8	7.4	470	465	525
B	B6	5	5	5	7.4	7.8	7.9	25.2	24.8	25.4	7.1	7.6	7.4	490	505	535
C	B7	5	5	5	7.3	7.8	7.8	25.1	24.8	26.4	7.0	7.7	7.0	500	505	540
D	B8	5	5	5	7.3	7.8	7.9	25.1	25.5	25.1	7.0	7.8	7.1	500	530	540
measured by:		SG	SG	KL	DPH	DPH	KL	DPH	DPH	KL	DPH	DPH	KL	DPH	DPH	SG
recorded by:		~~DPH~~ KL	DPH	KL	KL	SG	KL	KL	SG	SG	KL	SG	SG	KL	SG	KL

Investigators' Signatures
Shannon Gerard
Kellie Banks Agnew
K Parker
Randall Faircloth
AA Wolfe
reviewer

Temperature Range °C
Incubator # 3 24.5° - 25.5°C
Room 6246 25.5° - 27.5°C

Salt Water: (Well Water) 20% Min Water

Water Quality Parameters	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	—	—	—	—
Lab Total Residual Cl2 (mg/L):	<0.03	DR100	DPH/KL	SG
Alkalinity (mg/L as $CaCO_3$):	60	Hach	KL/SG	SG
Hardness (mg/L as $CaCO_3$):	149	Hach	KL/SG	SG
Total ammonia (mg/L as N):	0.235	Denver	DPH/KL	SG
Salinity:	0	Ysi	DPH/KL	SG

form updated 3/3/99

Brittany Estates Mobile Home Park WWTP - Stream Condition Index

Control Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	**28**	≥27	26-14	<14	**5**
EPT Index	**0**	≥4	3-2	<2	**1**
# Chironomid Taxa	**12**	≥9	8-5	<5	**5**
% Contribution of Dominant Taxon	**25.4**	≤30	31-65	>65	**5**
% Diptera	**50.0**	-	≤52	>52	**3**
Florida Index	**11**	≥10	9-5	<5	**5**
% Suspension feeders/Filterers	**15.4**	≥15	14-8	<8	**5**
Total Score		**Peninsula**			**29**
Interpretation of Scores		**Excellent**			**27-33**
		Good			21-26
		Poor			14-20
		Severely Degraded			7-13

Test Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	**39**	≥27	26-14	<14	**5**
EPT Index	**1**	≥4	3-2	<2	**1**
# Chironomid Taxa	**16**	≥9	8-5	<5	**5**
% Contribution of Dominant Taxon	**16.5**	≤30	31-65	>65	**5**
% Diptera	**69.8**	-	≤52	>52	**1**
Florida Index	**15**	≥10	9-5	<5	**5**
% Suspension feeders/Filterers	**11.6**	≥15	14-8	<8	**3**
Total Score		**Peninsula**			**25**
Interpretation of Scores		Excellent			27-33
		Good			**21-26**
		Poor			14-20
		Severely Degraded			7-13

Winter Index Period: Stream Condition Index (SCI) for Florida Peninsula (April 1996)

Periphyton taxa list and densities (#/cm^2) for Brittany Estates, collected via glass microscope slides in Little Hatchet Creek, on 27 March 2000.

	Control Site	Test Site
Bacillariophyceae		
Achnanthes clevei clevei	945	–
Achnanthes exigua	945	1855
Achnanthes lanceolata	11338	4638
Amphipleura lindheimeri	1890	–
Amphipleura sp.	–	928
Cocconeis placentula	58581	10203
Cymbella tumida tumida	6614	–
Cymbellaceae	3779	–
Diatomaceae	945	–
Eunotia glacialis	945	–
Eunotia sp.	21732	3710
Gomphonema parvulum	–	928
Navicula cryptocephala	–	2783
Navicula minima	945	4638
Navicula sp.	945	–
Nitzschia amphibia	–	928
Nitzschia sp.	–	3710
Synedra sp.	945	928
Chlorophyceae		
Chlamydomonas sp.	945	–
Oedogonium sp.	945	–
Scenedesmus quadricauda	–	928
Selenastrum sp.	945	928
Und. Chlorophyceae	5669	4638
Chrysophyceae		
Mallomonas sp.	–	928
Cyanophyceae		
Anabaena sp.	–	928
Chroococcaceae	945	1855
Lyngbya sp.	3779	13913
Merismopedia sp.	–	928
Microcystis sp.	–	928
Oscillatoria sp.	3779	9275
Synechococcus sp.	2835	6493

	Control Site	Test Site
Bacillariophyceae		
Achnanthes clevei clevei	945	–
Achnanthes exigua	945	1855
Achnanthes lanceolata	11338	4638
Amphipleura lindheimeri	1890	–
Amphipleura sp.	–	928
Cocconeis placentula	58581	10203
Cymbella tumida tumida	6614	–
Cymbellaceae	3779	–
Diatomaceae	945	–
Eunotia glacialis	945	–
Eunotia sp.	21732	3710
Gomphonema parvulum	–	928
Navicula cryptocephala	–	2783
Navicula minima	945	4638
Navicula sp.	945	–
Nitzschia amphibia	–	928
Nitzschia sp.	–	3710
Synedra sp.	945	928
Chlorophyceae		
Chlamydomonas sp.	945	–
Oedogonium sp.	945	–
Scenedesmus quadricauda	–	928
Selenastrum sp.	945	928
Und. Chlorophyceae	5669	4638
Chrysophyceae		
Mallomonas sp.	–	928
Cyanophyceae		
Anabaena sp.	–	928
Chroococcaceae	945	1855
Lyngbya sp.	3779	13913
Merismopedia sp.	–	928
Microcystis sp.	–	928
Oscillatoria sp.	3779	9275
Synechococcus sp.	2835	6493

Phytoplankton taxa list and densities (#/mL) for Brittany Estates, collected via water bottle grabs from the Little Hatchet Creek, on 27 March 2000.

	Control Site	Test Site
Bacillariophyceae		
Achnanthes exigua	4	11
Achnanthes lanceolata	16	15
Achnanthes minutissima	2	–
Achnanthes sp.	2	2
Cocconeis disculus disculus	–	41
Cocconeis placentula	4	6
Cocconeis sp.	20	–
Cyclotella sp.	–	2
Cymbella minuta minuta	2	–
Cymbella minuta pseudogracilis	–	2
Cymbella minuta silesiaca	–	2
Cymbella tumida tumida	4	2
Diatomaceae	2	2
Diploneis ovalis	2	–
Eunotia major	2	–
Eunotia sp.	7	2
Gomphonema sp.	2	–
Hantzschia sp.	–	2
Navicula capitata capitata	2	2
Navicula constans	4	4
Navicula cryptocephala	5	6
Navicula cryptotenella	–	2
Navicula cuspidata	5	4
Navicula minima	9	9
Navicula radiosa	2	2
Navicula sp.	2	2
Nitzschia amphibia	2	–
Nitzschia gracilis	2	2
Nitzschia palea	5	2
Nitzschia sp.	7	7
Pinnularia sp.	–	2
Stauroneis prominula	–	2

Continued from Taxa List, Phytoplankton

	Control Site	Test Site
Surirella sp.	2	2
Synedra sp.	2	2
Chlorophyceae		
Actinastrum sp.	5	6
Ankistrodesmus falcatus	5	2
Chlamydomonas sp.	4	7
Chlorella sp.	4	–
Scenedesmus acuminatus	4	–
Scenedesmus quadricauda	5	4
Undetermined Chlorophyceae	11	13
Chrysophyceae		
Mallomonas sp.	2	2
Cryptophyceae		
Chroomonas sp.	7	7
Cryptomonas sp.	4	7
Undetermined Cryptophyceae	13	17
Cyanophyceae		
Anabaena sp.	4	2
Chroococcaceae	4	2
Chroococcus sp.	–	2
Dactylococcopsis sp.	2	–
Lyngbya contorta	–	2
Lyngbya sp.	4	4
Oscillatoria limnetica	2	–
Oscillatoria sp.	60	46
Synechococcus sp.	4	–
Euglenophyceae		
Trachelomonas sp.	–	2

Benthic macroinvertebrate taxa list for Brittany Estates, collected via 20 discrete dip net sweeps in Little Hatchet Creek, on 27 March, 2000.

	Control Site	Test Site
Acariformes		
Neumania sp.	3	–
Oribatei	11	
Coleoptera		
Cymbiodyta sp.	–	1
Elmidae	–	2
Enochrus sp.	–	1
Microcylloepus pusillus	1	1
Peltodytes sp.	–	1
Stenelmis sp.	3	2
Tropisternus blatchleyi	1	–
Diptera		
Ablabesmyia mallochi	11	6
Atrichopogon sp.	2	9
Ceratopogonidae	–	4
Chironomidae	5	10
Chironomus sp.	19	35
Conchapelopia sp.	–	7
Corynoneura sp.	–	1
Cricotopus bicinctus	–	1
Hemerodromia sp.	–	1
Nanocladius sp.	1	1
Paracladopelma nereis	–	6
Paramerina sp.	1	–
Parametriocnemus sp.	–	2
Paratanytarsus dissimilis	3	7
Paratanytarsus sp. C Epler	3	–
Pericoma sp.	–	12
Polypedilum illinoense grp.	4	15
Polypedilum scalaenum grp.	2	10
Rheocricotopus robacki sp.	2	4
Rheosmittia sp.	1	–
Rheotanytarsus distinctissimus grp.	–	1
Simuliidae	1	1
Tanytarsus sp. L Epler	1	–
Tanytarsus sp. U Epler	9	8
Tanytarsus sp.	–	3
Thienemanniella sp.	–	1
Thienemannimyia grp.	–	2
Tipulidae	–	1

Continued from Taxa List, Qualitative Sample

	Control Site	Test Site
Gastropoda		
Ancylidae	32	15
Micromenetus dilatatus	2	–
Micromenetus sp.	–	5
Undetermined Gastropoda	1	1
Hemiptera		
Rhagovelia sp.	1	–
Lepidoptera		
Undetermined Lepidoptera	–	1
Odonata		
Aeshnidae	1	–
Argia sp.	1	3
Gomphidae	1	2
Progomphus sp.	3	–
Oligochaeta		
Eclipidrilus sp.	–	2
Enchytraeidae	–	1
Lumbriculus variegatus	–	1
Slavina appendiculata	1	2
Pelecypoda		
Sphaeriidae	7	3
Undetermined Pelecypoda	4	6
Trichoptera		
Cheumatopsyche sp.	–	1
Hydropsychidae	–	6
Undetermined Trichoptera	–	1
Turbellaria		
Planariidae	2	5

Benthic macroinvertebrate taxa list for Brittany Estates, collected via Hester-Dendy artificial substrates in Little Hatchet Creek, on 27 March 2000. Densities, in number/m^2, represent the mean of three replicates.

	Control Site	Test Site
Acariformes		
Oribatei	–	3
Coleoptera		
Helichus fastigiatus	–	3
Microcylloepus pusillus	3	3
Diptera		
Ablabesmyia mallochi	61	34
Ablabesmyia rhamphe grp.	–	3
Chironomidae	40	69
Chironomus sp.	124	310
Conchapelopia sp.	–	16
Corynoneura taris	–	8
Corynoneura sp.	3	11
Cricotopus bicinctus	–	11
Dicrotendipes simpsoni	3	–
Hemerodromia sp.	–	3
Kiefferulus sp.	–	8
Nanocladius sp.	5	–
Parachironomus directus	–	3
Paracladopelma nereis	–	13
Parametriocnemus sp.	–	3
Paratanytarsus dissimilis	11	3
Paratanytarsus sp. C Epler	–	5
Paratanytarsus sp.	–	11
Pericoma sp.	–	3
Phaenopsectra punctipes grp.	3	–
Polypedilum fallax	21	3
Polypedilum illinoense grp.	3	42
Polypedilum scalaenum grp.	–	21
Polypedilum tritum	–	3
Rheocricotopus robacki	–	5
Rheosmittia sp.	–	3

Continued from Taxa List, Quantitative Sample

	Control Site	Test Site
Diptera		
Rheosmittia sp.	–	3
Rheotanytarsus distinctissimus grp.	–	3
Rheotanytarsus exiguus grp.	–	3
Rheotanytarsus sp.	–	3
Simuliidae	–	5
Telmatoscopus sp.	–	5
Tanytarsus sp. L Epler	–	3
Tanytarsus sp. U Epler	77	74
Tanytarsus sp.	–	13
Thienemanniella xena	–	16
Thienemanniella sp.	–	3
Thienemannimyia grp.	3	40
Tribelos jucundum	3	3
Gastropoda		
Ancylidae	21	–
Ferrissia hendersoni	45	–
Ferrissia sp.	5	–
Hebetancylus excentricus	5	21
Laevapex fuscus	19	8
Micromenetus dilatatus avus	–	5
Micromenetus dilatatus	–	8
Physella sp.	3	3
Undetermined Gastropoda	–	3
Nemertea		
Prostoma rubrum	–	3
Odonata		
Argia sedula	–	3
Argia tibialis	5	16
Oligochaeta		
Dero digitata complex	–	5
Eclipidrilus sp.	–	13
Limnodrilus hoffmeisteri	–	3
Lumbriculus variegatus	–	16
Nais communis complex	–	26
Slavina appendiculata	21	101

Continued from Taxa List, Quantitative Sample

	Control Site	Test Site
Pelecypoda		
Sphaeriidae	3	3
Trichoptera		
Cheumatopsyche sp.	–	13
Hydropsychidae	–	11
Turbellaria		
Planariidae	–	56

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 FL0040215	11 12	000327	17	18 X	19 S	20 1

Remarks

21 66

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 FL0040215	11 12	000327	17	18 B	19 S	20 1

Remarks

21 66