MACROINVERTEBRATE ASSESSMENT OF PARR RESERVOIR AND MONTICELLO RESERVOIR NEAR THE V. C. SUMMER NUCLEAR STATION OPERATED BY SOUTH CAROLINA ELECTRIC & GAS COMPANY, FAIRFIELD COUNTY, SOUTH CAROLINA

APRIL 2009

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TABLE OF CONTENTS

		Page
	LIST OF TABLES	ii
	LIST OF FIGURES	x
I	SUMMARY	1
II	INTRODUCTION	2
III	DESCRIPTION OF THE STUDY AREA	2
IV	MATERIALS AND METHODS	4
	A. Field Procedures	4
	B. Laboratory Procedures	4
	C. Data Analysis	4
	1. Bioassessment Metrics	4
	2. Regression Analyses	5
V	RESULTS—Macroinvertebrate Community Analysis	5
VI	DISCUSSION	15
VII	REFERENCES	18

LIST OF TABLES

Table		Page
1	Macroinvertebrates, their NCBI tolerance values (TV) and functional feeding groups (FG) for two Parr Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.	19
2	Macroinvertebrates, their NCBI tolerance values (TV) and functional feeding groups (FG) for three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.	21
3	Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.	24
4	Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.	25
5	Results of the single factor ANOVA to detect differences in taxa richness, total abundance, EPT index, EPT abundance, NCBI, and percentage of the dominant taxon among sampling points for the petite Ponar data collected on Parr Reservoir, near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.	26
6	Results of the single-factor ANOVA to detect differences in taxa richness between points in Monticello Reservoir, 27 April 2009.	27
7	Averages of the $\log_{10}(x+1)$ transformed taxa richness values in Monticello Reservoir, listed in ascending order.	27
8	Results of the single-factor ANOVA to detect differences in taxa richness between the control and raw water intake points in Monticello Reservoir, 27 April 2009.	27
9	Results of the single-factor ANOVA to detect differences in total abundance between points in Monticello Reservoir , 27 April 2009.	27
10	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between points in Monticello Reservoir, 27 April 2009.	27
11	Results of the single-factor ANOVA to detect differences in EPT Index values between points in Monticello Reservoir , 27 April 2009.	28
12	Averages of the $\log_{10}(x+1)$ transformed EPT Index values in Monticello Reservoir, listed in ascending order.	28

LIST OF TABLES CONTINUED

Table		Page
13	Results of the single-factor ANOVA to detect differences in EPT Abundance values between points in Monticello Reservoir, 27 April 2009.	28
14	Averages of the $\log_{10}(x+1)$ transformed EPT Abundance data in Monticello Reservoir, listed in ascending order.	28
15	Results of the single-factor ANOVA to detect differences in NCBI values between points in Monticello Reservoir, 27 April 2009.	28
16	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between points in Monticello Reservoir, 27 April 2009.	29
17	Averages of the $\log_{10}(x+1)$ transformed SCDHEC Bioclassification data in Monticello Reservoir, listed in ascending order.	29
18	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the raw water intake and the water treatment intake points in Monticello Reservoir, 27 April 2009.	29
19	Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Point, Fairfield County, South Carolina, 18 June 2008.	30
20	Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Point, Fairfield County, South Carolina, 18 September 2008.	31
21	Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Point, Fairfield County, South Carolina, 22 January 2009.	32
22	Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Point, Fairfield County, South Carolina, 18 June 2008.	33
23	Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Point, Fairfield County, South Carolina, 18 September 2008.	34
24	Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Point, Fairfield County, South Carolina, 23 January 2009.	35

LIST OF TABLES CONTINUED

Table		Page
25	Results of the single-factor ANOVA to detect differences in taxa richness through time at the Parr Reservoir Control point.	36
26	Averages of the $\log_{10}(x+1)$ transformed taxa richness data at the Parr Reservoir Control point, listed in ascending order.	36
27	Results of the single-factor ANOVA to detect differences in taxa richness between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.	36
28	Results of the single-factor ANOVA to detect differences in total abundance through time at the Parr Reservoir Control point.	36
29	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Parr Reservoir Control point.	36
30	Averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data at the Parr Reservoir Control point, listed in ascending order.	37
31	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.	37
32	Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Parr Reservoir Control point.	37
33	Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Parr Reservoir Control point.	37
34	Results of the single-factor ANOVA to detect differences in NCBI values through time at the Parr Reservoir Control point.	37
35	Averages of the $\log_{10}(x+1)$ transformed NCBI values at the Parr Reservoir Control point, listed in ascending order.	38
36	Results of the single-factor ANOVA to detect differences in NCBI values between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.	38
37	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Parr Reservoir Control point.	38

LIST OF TABLES CONTINUED

Table		Page
38	Averages of the $\log_{10}(x+1)$ transformed SCDHEC bioclassification values at the Parr Reservoir Control point, listed in ascending order.	38
39	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.	38
40	Results of the single-factor ANOVA to detect differences in taxa richness through time at the Parr Reservoir Blowdown Discharge point.	39
41	Results of the single-factor ANOVA to detect differences in total abundance through time at the Parr Reservoir Blowdown Discharge point.	39
42	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Parr Reservoir Blowdown Discharge point.	39
43	Averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data at the Parr Reservoir Blowdown Discharge point, listed in ascending order.	39
44	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments at the Parr Reservoir Blowdown Discharge point.	39
45	Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Parr Reservoir Blowdown Discharge point.	40
46	Averages of the $\log_{10}(x+1)$ transformed EPT Index values at the Parr Reservoir Blowdown Discharge point, listed in ascending order.	40
47	Results of the single-factor ANOVA to detect differences in EPT Index values between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments at the Parr Reservoir Blowdown Discharge point.	40
48	Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Parr Reservoir Blowdown Discharge point.	40
49	Averages of the $\log_{10}(x+1)$ transformed EPT Abundance values at the Parr Reservoir Blowdown Discharge point, listed in ascending order.	40

LIST OF TABLES CONTINUED

Table		Page
50	Results of the single-factor ANOVA to detect differences in EPT Abundance values between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments at the Parr Reservoir Blowdown Discharge point.	41
51	Results of the single-factor ANOVA to detect differences in NCBI values through time at the Parr Reservoir Blowdown Discharge point.	41
52	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Parr Reservoir Blowdown Discharge point.	41
53	Results of the single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir Control point.	41
54	Results of the single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir Control point.	42
55	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir Control point.	42
56	Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Monticello Reservoir Control point.	42
57	Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir Control point.	42
58	Results of the single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir Control point.	42
59	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Monticello Reservoir Control point.	43
60	Results of the single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir Water Treatment Intake point.	43
61	Averages of the $\log_{10}(x+1)$ transformed taxa richness data at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.	43
62	Results of the single-factor ANOVA to detect differences in taxa richness between the 18 June 2008, 18 September 2008, and 23 January 2009 assessments at the Monticello Reservoir Water Treatment Intake point.	43

LIST OF TABLES CONTINUED

Table		Page
63	Results of the single-factor ANOVA to detect differences in taxa richness between the 18 September 2008 and 23 January 2009 assessments at the Monticello Reservoir Water Treatment Intake point.	44
64	Results of the single-factor ANOVA to detect differences in taxa richness between the 18 June 2008 and 27 April 2009 assessments at the Monticello Reservoir Water Treatment Intake point.	44
65	Results of the single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir Water Treatment Intake point.	44
66	Averages of the $\log_{10}(x+1)$ transformed total abundance data at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.	44
67	Results of the single-factor ANOVA to detect differences in total abundance between the 18 June 2008, 18 September 2008, and 23 January 2009 assessments at the Monticello Reservoir Water Treatment Intake point.	45
68	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir Water Treatment Intake point.	45
69	Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Monticello Reservoir Water Treatment Intake point.	45
70	Averages of the $\log_{10}(x+1)$ transformed EPT Index values at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.	45
71	Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir Water Treatment Intake point.	45
72	Averages of the $\log_{10}(x+1)$ transformed EPT Abundance values at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.	46
73	Results of the single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir Water Treatment Intake point.	46

LIST OF TABLES CONTINUED

Table		Page
74	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Monticello Reservoir Water Treatment Intake point.	46
75	Results of the single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir Raw Water Intake point.	46
76	Averages of the $\log_{10}(x+1)$ transformed taxa richness data at the Monticello Reservoir Raw Water Intake point, listed in ascending order.	46
77	Results of the single-factor ANOVA to detect differences in taxa richness between the 18 September 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.	47
78	Results of the single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir Raw Water Intake point.	47
79	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir Raw Water Intake point.	47
80	Averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon values at the Monticello Reservoir Raw Water Intake point, listed in ascending order.	47
81	Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between the 18 September 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.	48
82	Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Monticello Reservoir Raw Water Intake point.	48
83	Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir Raw Water Intake point.	48
84	Results of the single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir Raw water intake point.	48
85	Averages of the $\log_{10}(x+1)$ transformed NCBI values at the Monticello Reservoir Raw Water Intake point, listed in ascending order.	48

LIST OF TABLES CONTINUED

Table		Page
86	Results of the single-factor ANOVA to detect differences in NCBI values between the 18 June 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.	49
87	Results of the single-factor ANOVA to detect differences in NCBI values between the 18 June 2008 and 23 January 2009 assessments at the Monticello Reservoir Raw Water Intake point.	49
88	Results of the single-factor ANOVA to detect differences in NCBI values between the 18 September 2008 and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.	49
89	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Monticello Reservoir Raw Water Intake point.	49
90	Averages of the $\log_{10}(x+1)$ transformed SCDHEC Bioclassification values at the Monticello Reservoir Raw Water Intake point, listed in ascending order.	50
91	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 June 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.	50
92	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 June 2008 and 23 January 2009 assessments at the Monticello Reservoir Raw Water Intake point.	50
93	Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 September 2008 and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.	50

LIST OF FIGURES

Figure		Page
1	Sampling locations for benthic macroinvertebrates collected from Monticello Reservoir and Parr Reservoir, near the V. C. Summer Nuclear Station, Fairfield County, South Carolina.	3

I. SUMMARY

On April 27, 2009, personnel from SCANA Services, Inc. collected petite Ponar macroinvertebrate samples from Monticello Reservoir and Parr Reservoir near the V. C. Summer Nuclear Station. The collected macroinvertebrates were identified and the data were analyzed by CARNAGEY BIOLOGICAL SERVICES, LLC (SC DHEC Laboratory Certification No. 32572). The objective of this assessment was to determine the condition of the macroinvertebrate community at the proposed water treatment intake in Monticello Reservoir, the proposed new raw water intake in Monticello Reservoir, relative to a control station up lake of these stations. A second objective of this assessment was to determine the condition of the macroinvertebrate community at the proposed new cooling tower blowdown discharge location in Parr Reservoir, relative to the control conditions at a control station located upstream. Finally, a comparison of past assessments at these stations will be made.

Parr Reservoir showed little, if any differences among the control and blowdown discharge points. At the control point, the assessment performed on 23 January 2009 was somewhat better than the other three assessments. At the blowdown discharge point, the 18 September 2008 assessment was slightly better than the other three assessments.

Monticello Reservoir also showed few differences among the control, water treatment intake or raw intake points. In addition, none of the assessments showed any large differences across time.

II. INTRODUCTION

On April 27, 2009, a benthic macroinvertebrate community assessment was conducted on Monticello Reservoir (6,800 acres) and Parr Reservoir (4,400 acres) near the V. C. Summer Nuclear Station located Fairfield County, South Carolina. Fairfield Pumped Storage Facility connects the two impoundments allowing for daily fluctuations in water levels at both impoundments. SCE&G has filed a license application with the Nuclear Regulatory Commission for the right to construct and operate two new nuclear units. The two new units will withdraw water from Monticello Reservoir and discharge cooling tower blowdown and other liquid wastes into Parr Reservoir. This assessment is part of a larger study to document the macroinvertebrate community in and around the V. C. Summer Nuclear Plant. The objective of this assessment was to determine the condition of the macroinvertebrate community at the proposed water treatment intake in Monticello Reservoir, and the proposed new raw water intake in Monticello Reservoir, relative to a control station up lake of these stations. A second objective of this assessment was to determine the condition of the macroinvertebrate community at the proposed new cooling tower blowdown discharge location in Parr Reservoir, relative to the control conditions at an upstream control station. Finally, a comparison of past assessments at theses stations will be made.

III. DESCRIPTION OF THE STUDY AREA

Collections of aquatic macroinvertebrates were made from five sampling locations in Monticello Reservoir and Parr Reservoir near the V. C. Summer Nuclear Station (Figure 1).

Parr Reservoir Control was located upstream of Hellers Creek, approximately 9.0 kilometers above the Parr Shoals dam. The substrate at this station consisted mainly of sand.

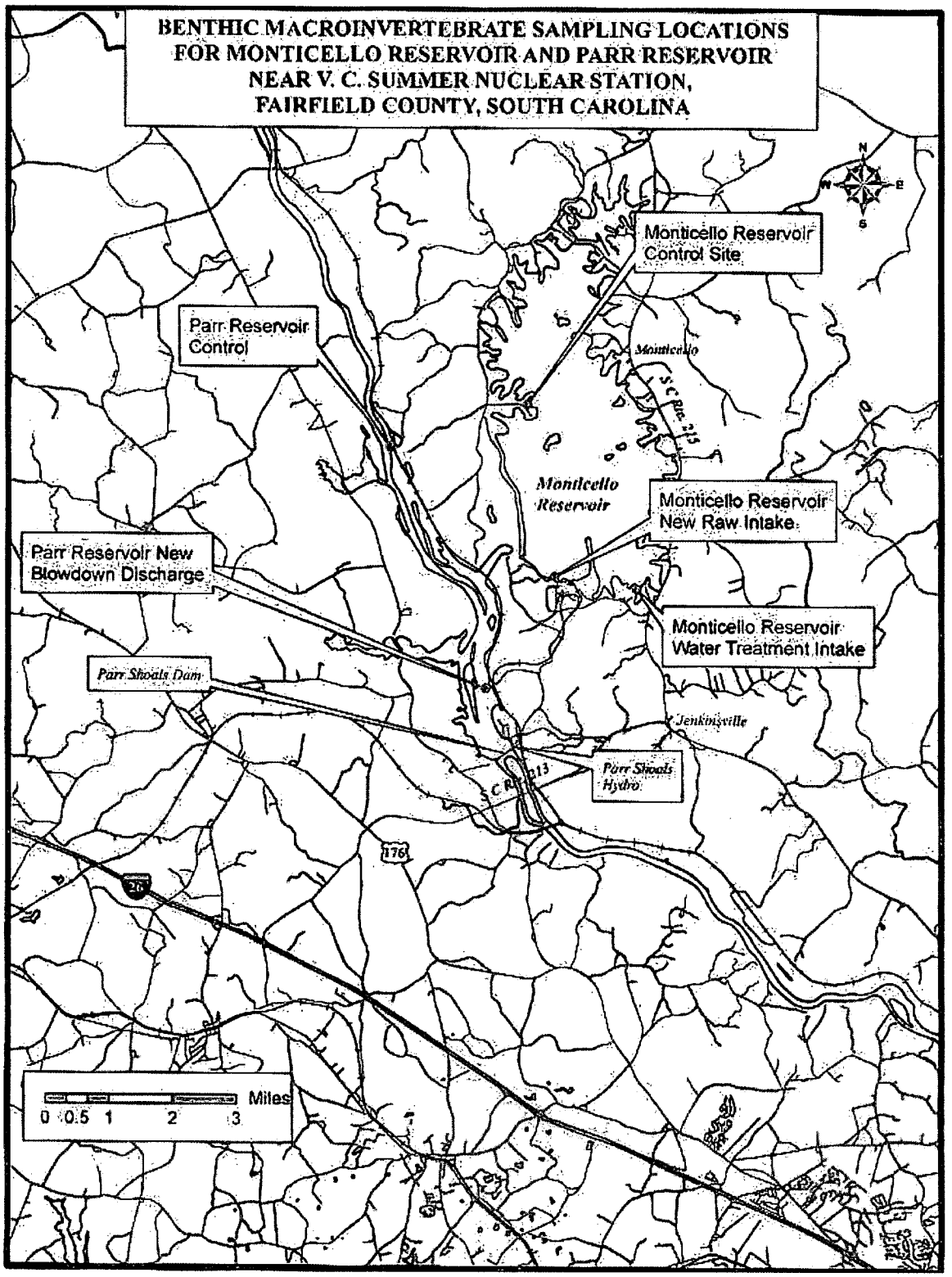
Parr Reservoir New Blowdown Discharge was located at the location of the proposed new cooling tower blowdown discharge from the proposed two new nuclear units at the V. C. Summer Nuclear Station, and approximately 1.0 kilometers upstream of the Parr Shoals dam. The substrate at this station consisted mainly of sand.

Monticello Reservoir Control, was located on the western side of the lake approximately 5.0 kilometers north of the V. C. Summer Nuclear Station. The substrate at this station consisted mainly of sand and clay.

Monticello Reservoir New Water Treatment Intake was located at the proposed intake point for the water treatment plant. The substrate consisted mainly of clay and sand.

Monticello Reservoir Raw Water Intake was located at the proposed intake point for the V. C. Summer Nuclear Plant. The substrate consisted mainly of clay and sand.

Figure 1. Sampling locations for benthic macroinvertebrates collected from Monticello Reservoir and Parr Reservoir, near the V. C. Summer Nuclear Station, Fairfield County, South Carolina.



IV. MATERIALS AND METHODS

A. Field Procedures--Petite Ponar Grab Samples

Quantitative sampling of the benthic macroinvertebrate communities of Monticello Reservoir and Parr Reservoir was performed using a petite Ponar grab sampler, as described in method 10500 (APHA, 1995). Five random replicate (15 X 15 cm) Ponar grab samples of sediment were collected from the lake at each location. Replicates were sieved in the field with a U.S. Standard No. 35 sieve (0.500 mm mesh), then placed individually in plastic bags, preserved with 85% ethanol, and transported to the laboratory for analysis.

B. Laboratory Procedures

Upon return to the laboratory, all samples were washed over a U.S. Standard No. 35 sieve and organisms were sorted from the remaining material using forceps and the aid of a stereomicroscope. The organisms were retained in 70% ethanol, and identified to the lowest positive taxonomic level. All specimens will be maintained by Carnagey Biological Services, LLC, in a voucher collection for five years, or placed into the permanent reference collection.

C. Data Analysis

To obtain the most information possible from the data, several types of analysis were performed. Bioassessment metrics allowed comparison of stations based on their overall taxonomic composition. A single factor ANOVA was used to detect trends in macroinvertebrate community composition between the stations.

1. Bioassessment Metrics

Comparisons of the macroinvertebrate communities were based on changes in taxonomic composition between sampling sites and on the known tolerance levels and life history strategies of the organisms encountered. Changes in taxonomic composition were determined using the metrics outlined in Rapid Bioassessment Protocol III of *Rapid bioassessment protocols for use in streams and rivers* (Plafkin et al. 1989). These metrics include the following:

a) Taxa richness - The number of different taxa found at a particular location is an indication of diversity. Reductions in community diversity have been positively associated with various forms of environmental pollution, including nutrient loading, toxic substances, and sedimentation (Barbour *et al.*, 1996; Fore *et al.*, 1996; Rosenberg and Resh, 1993; Shackleford, 1988).

b) EPT Index - EPT Index is the number of taxa from the insect orders Ephemeroptera, Plecoptera and Trichoptera found at a station. These three insect orders are considered to be intolerant of adverse changes in water quality, especially temperature and dissolved oxygen, and therefore, a reduction in these taxa is indicative of reduced water quality (Barbour *et al.*, 1996; Lenat, 1988).

c) Chironomidae taxa and abundance - The Chironomidae are a taxonomically and ecologically diverse group with many taxa which are tolerant of various forms of pollution. The chironomids are often the dominant group encountered at impacted or stressed sites (Rosenberg and Resh, 1993).

d) Ratio of EPT and Chironomidae abundance - The relative abundance of these four indicator groups is a measure of community balance. When comparing sites, good biotic conditions are reflected in a fairly even distribution among these four groups (Plafkin *et al.*, 1989). The value of this ratio is reduced by impact due to the general reduction of the more sensitive EPT taxa and an increase in the more tolerant chironomid taxa.

e) Ratio of scraper/scraper and filtering collectors - When comparing sites, shifts in the dominance of a particular feeding type may indicate a community responding to an over-abundance of a particular food source or toxicants bound to a particular food source (Rosenberg and Resh, 1993).

f) Percent contribution of dominant taxon - This measures the redundancy and evenness of the community structure. It assumes a highly redundant community reflects an impaired community because as the more sensitive taxa are eliminated, there is often a significant increase in the remaining tolerant forms (Barbour *et al.*, 1996; Shackleford, 1988).

g) North Carolina biotic index (NCBI) - NCBI = $TV_i N_i/N$ where TV_i is the tolerance value for the *i*th taxon, N_i is the abundance of the *i*th taxon, and N is the total abundance of all taxa in the sample. This index utilizes a pollution tolerance value developed over a wide range of conditions and pollution types and taxon abundance to assess the amount of impact (North Carolina Department of Environment, Health and Natural Resources, 1997). The values range from 0-10, increasing as water quality decreases. This metric appears to be adversely affected by the combination of low taxa richness and low abundance, often indicating better conditions than actually exist.

2. Regression Analyses

To detect differences in the two bodies of water, single factor ANOVA analyses were performed on the data. Data were $\log_{10}(x+1)$ transformed prior to analyzing taxa richness, total abundance, percentage of the dominant taxon. EPT index, EPT abundance, NCBI values, and SCDHEC bioclassification

V. RESULTS--Macroinvertebrate Community Analysis

From Parr Reservoir, a total of 201 specimens representing 12 taxa were collected from the two points on 27 April 2009. The number of specimens collected, their NCBI tolerance values, and functional feeding groups are presented in Table 1 for each sample. Bioassessment metrics for each sample are presented in Table 3. In addition, the bioassessment metrics for the 18 June 2008, 18 September 2008, and 22 January 2009 are presented in Tables 19-21.

The bioassessment metrics indicated very few differences between the points. The control was dominated by scrapers in four of the replicates and by collector-filterers in one replicate. The blowdown discharge point was dominated by scrapers in all five replicates.

Single factor ANOVA analyses of the 27 April 2009 data are given in Table 5. There was no significant difference in taxa richness (p-value = 0.0752), total abundance (p-value =

0.5253), percentage of the dominant taxon (p-value = 0.4290), EPT Index (p-value = 1.0000), EPT abundance (p-value = 1.0000), NCBI (p-value = 0.3619), or SCDHEC bioclassification (p-value = 0.4723).

From Monticello Reservoir, a total of 405 specimens representing 24 taxa were collected from the three points on 27 April 2009. The number of specimens collected, their NCBI tolerance values, and functional feeding groups are presented in Table 2 for each sample. Bioassessment metrics for each sample are presented in Table 4. In addition, the bioassessment metrics for the 18 June 2008, 18 September 2008, and 23 January 2009 are presented in Tables 22-24.

The bioassessment metrics indicated some differences between the points. Most significantly, the raw water intake point was the only location in which any EPT taxa were collected. The control was dominated by collector-filterers in four of the replicates and collector-gatherers in one of the replicates. The water treatment intake point was dominated by collector-gatherers in all five of the replicates. One of the replicates was dominated by an equal number of collector-filterers and scrapers. The Raw water intake point was dominated by collector-gatherers in four of the replicates and by an equal number of collector-gatherers and scapers in the other replicate.

Results of a single-factor ANOVA to detect differences in taxa richness among points in Monticello Reservoir on 27 April 2009 are presented in Table 6. There was a significant difference (p-value = 0.04737) in taxa richness between points.

In order to determine which point had significant differences in taxa richness values, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed taxa richness values are listed in ascending order in Table 7. Because water treatment intake had the greatest average value, a single-factor ANOVA was performed without that points data. This ANOVA showed no significant difference between the taxa richness values for the control or raw water intake points (p-value = 0.52217, Table 8).

Results of a single-factor ANOVA to detect differences in total abundance among points in Monticello Reservoir on 27 April 2009 are presented in Table 9. There was no significant difference (p-value = 0.05776) in total abundance between points.

Results of a single-factor ANOVA to detect differences in percentage of dominant taxon among points in Monticello Reservoir on 27 April 2009 are presented in Table 10. There was no significant difference (p-value = 0.10171) in percentage of dominant taxon between points.

Results of a single-factor ANOVA to detect differences in EPT Index values among points in Monticello Reservoir on 27 April 2009 are presented in Table 11. There was a significant difference in EPT Index values between points.

In order to determine which point had significant differences in EPT Index values, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed EPT Index values are listed in ascending order in Table 12. The Raw water intake point had the highest average. Both water treatment intake and control had average values of zero, so an ANOVA was unnecessary.

Results of a single-factor ANOVA to detect differences in EPT abundance among points in Monticello Reservoir on 27 April 2009 are presented in Table 13. There was a significant difference (p-value = 0.00001) in EPT abundance between points.

In order to determine which point had significant differences in EPT abundance, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed EPT abundance data are listed in ascending order in Table 14. The Raw water intake point had the highest average. Both water treatment intake and control had average values of zero, so an ANOVA was unnecessary.

Results of a single-factor ANOVA to detect differences in NCBI values among points in Monticello Reservoir on 27 April 2009 are presented in Table 15. There was no significant difference (p-value = 0.71889) in NCBI values between points.

Results of a single-factor ANOVA to detect differences in SCDHEC bioclassification values among points in Monticello Reservoir on 27 April 2009 are presented in Table 16. There was a significant difference (p-value = 0.04309) in SCDHEC bioclassification values between points.

In order to determine which point had significant differences in SCDHEC bioclassification values, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed SCDHEC bioclassification values are listed in ascending order in Table 17. Because the Control point had the lowest average value, a single-factor ANOVA was performed without that points data. This ANOVA showed no significant difference between the SCDHEC bioclassification values for the water treatment intake or raw water intake points (p-value = 0.96409, Table 18).

Results of a single-factor ANOVA to detect differences in taxa richness through time at the Parr Reservoir control point are presented in Table 25. There was a significant difference (p-value = 0.01531) in taxa richness through time at the Parr Reservoir control point.

In order to determine which assessment had significant differences in taxa richness, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed taxa richness data are listed in ascending order in Table 26. Since the 22 January 2009 assessment had the highest average $\log_{10}(x+1)$ transformed taxa richness, an ANOVA was performed without that

assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments (p-value = 0.44728, Table 27).

Results of a single-factor ANOVA to detect differences in total abundance through time at the Parr Reservoir control point are presented in Table 28. There was no significant difference (p-value = 0.05300) in total abundance through time at the Parr Reservoir control point.

Results of a single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Parr Reservoir control point are presented in Table 29. There was a significant difference (p-value = 0.00093) in percentage of the dominant taxon through time at the Parr Reservoir control point.

In order to determine which assessment had significant differences in percentage of the dominant taxon, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data are listed in ascending order in Table 30. Since the 22 January 2009 assessment had the lowest average $\log_{10}(x+1)$ transformed percentage of the dominant taxon, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments (p-value = 0.33117, Table 31).

Results of a single-factor ANOVA to detect differences in EPT Index through time at the Parr Reservoir control point are presented in Table 32. There was no significant difference (p-value = 0.21404) in EPT Index through time at the Parr Reservoir control point.

Results of a single-factor ANOVA to detect differences in EPT Abundance through time at the Parr Reservoir control point are presented in Table 33. There was no significant difference (p-value = 0.17075) in EPT Abundance through time at the Parr Reservoir control point.

Results of a single-factor ANOVA to detect differences in NCBI values through time at the Parr Reservoir control point are presented in Table 34. There was a significant difference (p-value = 0.00483) in NCBI values through time at the Parr Reservoir control point.

In order to determine which assessment had significant differences in NCBI values, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed NCBI values data are listed in ascending order in Table 35. Since the 22 January 2009 assessment had the lowest average $\log_{10}(x+1)$ transformed NCBI values, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments (p-value = 0.31955, Table 36).

Results of a single-factor ANOVA to detect differences in SCDHEC bioclassification values through time at the Parr Reservoir control point are presented in Table 37. There was a significant difference (p-value = 0.02928) in SCDHEC bioclassification values through time at the Parr Reservoir control point.

In order to determine which assessment had significant differences in SCDHEC bioclassification values, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed SCDHEC bioclassification values data are listed in ascending order in Table 38. Since the 22 January assessment had the lowest average $\log_{10}(x+1)$ transformed SCDHEC bioclassification values, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments (p-value = 0.27163, Table 39).

Results of a single-factor ANOVA to detect differences in taxa richness through time at the Parr Reservoir blowdown discharge point are presented in Table 40. There was no significant difference (p-value = 0.26832) in taxa richness through time at the Parr Reservoir blowdown discharge point.

Results of a single-factor ANOVA to detect differences in total abundance through time at the Parr Reservoir blowdown discharge point are presented in Table 41. There was no significant difference (p-value = 0.08798) in total abundance through time at the Parr Reservoir blowdown discharge point.

Results of a single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Parr Reservoir blowdown discharge point are presented in Table 42. There was a significant difference (p-value = 0.03499) in percentage of the dominant taxon through time at the Parr Reservoir blowdown discharge point.

In order to determine which assessment had significant differences in percentage of the dominant taxon, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data are listed in ascending order in Table 43. Since the 18 September 2008 assessment had the lowest average $\log_{10}(x+1)$ transformed percentage of the dominant taxon, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments (p-value = 0.91220, Table 44).

Results of a single-factor ANOVA to detect differences in EPT Index through time at the Parr Reservoir blowdown discharge point are presented in Table 45. There was a significant difference (p-value = 0.00592) in EPT Index through time at the Parr Reservoir blowdown discharge point.

In order to determine which assessment had significant differences in EPT Index value, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed EPT Index values are listed in

ascending order in Table 46. Since the 18 September 2008 assessment had the highest average $\log_{10}(x+1)$ transformed EPT Index value, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments (p-value = 0.75645, Table 47).

Results of a single-factor ANOVA to detect differences in EPT Abundance through time at the Parr Reservoir blowdown discharge point are presented in Table 48. There was a significant difference (p-value = 0.00010) in EPT Abundance through time at the Parr Reservoir blowdown discharge point.

In order to determine which assessment had significant differences in EPT Abundance value, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed EPT Abundance values are listed in ascending order in Table 49. Since the 18 September 2008 assessment had the highest average $\log_{10}(x+1)$ transformed EPT Abundance value, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments (p-value = 0.75645, Table 50).

Results of a single-factor ANOVA to detect differences in NCBI values through time at the Parr Reservoir blowdown discharge point are presented in Table 51. There was no significant difference (p-value = 0.24420) in NCBI values through time at the Parr Reservoir blowdown discharge point.

Results of a single-factor ANOVA to detect differences in SCDHEC bioclassification values through time at the Parr Reservoir blowdown discharge point are presented in Table 52. There was no significant difference (p-value = 0.19621) in SCDHEC bioclassification values through time at the Parr Reservoir blowdown discharge point.

Results of a single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir control point are presented in Table 53. There was no significant difference (p-value = 0.05355) in taxa richness through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir control point are presented in Table 54. There was no significant difference (p-value = 0.78587) in total abundance through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir control point are presented in Table 55. There was no significant difference (p-value = 0.18211) in percentage of the dominant taxon through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in EPT Index through time at the Monticello Reservoir control point are presented in Table 56. There was no significant difference (p-value = 0.14331) in EPT Index through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir control point are presented in Table 57. There was no significant difference (p-value = 0.10952) in EPT Abundance through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir control point are presented in Table 58. There was no significant difference (p-value = 0.22500) in NCBI values through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in SCDHEC bioclassification values through time at the Monticello Reservoir control point are presented in Table 59. There was no significant difference (p-value = 0.20839) in SCDHEC bioclassification values through time at the Monticello Reservoir control point.

Results of a single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir water treatment intake point are presented in Table 60. There was a significant difference (p-value = 0.05355) in taxa richness through time at the Monticello Reservoir water treatment intake point.

In order to determine which assessment had significant differences in total abundance, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed total abundance data are listed in ascending order in Table 61. Since the 27 April 2009 assessment had the highest average $\log_{10}(x+1)$ transformed total abundance, an ANOVA was performed without that assessment's data. The results of this ANOVA showed a significant difference in total abundance between 18 June 2008, 18 September 2008, and 23 January assessments (p = 0.04787, Table 62). A third ANOVA was performed without the data from 18 June 2008. This ANOVA showed no significant difference between the 18 September 2008 and 23 January 2009 assessments (p-value = 0.64754, Table 63). A fourth ANOVA was performed to test whether the 27 April 2009 and the 18 June 2008 assessments were significantly different. This ANOVA showed no significant difference between the 18 June 2008 and 27 April 2009 assessments (p-value = 0.07764, Table 64).

Results of a single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir water treatment intake point are presented in Table 65. There was a significant difference (p-value = 0.00199) in total abundance through time at the Monticello Reservoir water treatment intake point.

In order to determine which assessment had significant differences in total abundance, a multiple comparison procedure consisting of additional single-factor ANOVAs was

performed. The averages of the $\log_{10}(x+1)$ transformed total abundance data are listed in ascending order in Table 66. Since the 27 April 2009 assessment had the highest average $\log_{10}(x+1)$ transformed total abundance, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 June 2008, 18 September 2008, and 23 January 2009 assessments (p-value = 0.12244, Table 67).

Results of a single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir water treatment intake point are presented in Table 68. There was no significant difference (p-value = 0.20688) in percentage of the dominant taxon through time at the Monticello Reservoir water treatment intake point.

Results of a single-factor ANOVA to detect differences in EPT Index through time at the Monticello Reservoir water treatment intake point are presented in Table 69. There was a significant difference in EPT Index through time at the Monticello Reservoir Water treatment intake point.

In order to determine which assessment had significant differences in EPT Index, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed EPT Index values are listed in ascending order in Table 70. Since the 18 September 2008, 23 January 2009, and 27 April 2009 assessments had average $\log_{10}(x+1)$ transformed EPT Index values of zero, no other ANOVA was needed.

Results of a single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir water treatment intake point are presented in Table 71. There was a significant difference (p-value = 0.00000000001) in EPT Abundance through time at the Monticello Reservoir water treatment intake point.

In order to determine which assessment had significant differences in EPT Abundance, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed EPT Abundance values are listed in ascending order in Table 72. Since the 18 September 2008, 23 January 2009, and 27 April 2009 assessments had average $\log_{10}(x+1)$ transformed EPT Abundance values of zero, no other ANOVA was needed.

Results of a single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir water treatment intake point are presented in Table 73. There was no significant difference (p-value = 0.08912) in NCBI values through time at the Monticello Reservoir water treatment intake point.

Results of a single-factor ANOVA to detect differences in SCDHEC bioclassification values through time at the Monticello Reservoir water treatment intake point are presented in Table 74. There was no significant difference (p-value = 0.05787) in SCDHEC bioclassification values through time at the Monticello Reservoir water treatment intake point.

Results of a single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir raw water intake point are presented in Table 75. There was a significant difference (p-value = 0.01510) in taxa richness through time at the Monticello Reservoir raw water intake point.

In order to determine which assessment had significant differences in total abundance, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed total abundance data are listed in ascending order in Table 76. Since the 18 June 2008 assessment had the highest average $\log_{10}(x+1)$ transformed total abundance, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 September 2008, 23 January 2009, and 27 April 2009 assessments (p-value = 0.06897, Table 77).

Results of a single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir raw water intake point are presented in Table 78. There was no significant difference (p-value = 0.45200) in total abundance through time at the Monticello Reservoir raw water intake point.

Results of a single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir raw water intake point are presented in Table 79. There was a significant difference (p-value = 0.00097) in percentage of the dominant taxon through time at the Monticello Reservoir raw water intake point.

In order to determine which assessment had significant differences in percentage of the dominant taxon, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data are listed in ascending order in Table 80. Since the 18 June 2008 assessment had the highest average $\log_{10}(x+1)$ transformed percentage of the dominant taxon, an ANOVA was performed without that assessment's data. This ANOVA showed no significant difference between the 18 September 2008, 23 January 2009, and 27 April 2009 assessments (p-value = 0.27855, Table 81).

Results of a single-factor ANOVA to detect differences in EPT Index through time at the Monticello Reservoir raw water intake point are presented in Table 82. There was no significant difference (p-value = 0.41824) in EPT Index through time at the Monticello Reservoir raw water intake point.

Results of a single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir raw water intake point are presented in Table 83. There was no significant difference (p-value = 0.85105) in EPT Abundance through time at the Monticello Reservoir raw water intake point.

Results of a single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir raw water intake point are presented in Table 84. There was a

significant difference (p-value = 0.00067) in NCBI values through time at the Monticello Reservoir raw water intake point.

In order to determine which assessment had significant differences in NCBI, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed NCBI values are listed in ascending order in Table 85. Since the 18 September 2008 assessment had the lowest average $\log_{10}(x+1)$ transformed NCBI value, an ANOVA was performed without that assessment's data. The results of this ANOVA showed a significant difference in NCBI values between the 18 June 2008, 23 January 2009, and 27 April 2009 assessments (p = 0.00860, Table 86). A third ANOVA was performed without the data from 27 April 2009. This ANOVA showed no significant difference between the 18 June 2008 and 23 January 2009 assessments (p-value = 0.57796, Table 87). A fourth ANOVA was performed to test whether the 18 September 2008 and 27 April 2009 assessments were significantly different. This ANOVA showed a significant difference between the 18 September 2008 and 27 April 2009 assessments (p-value = 0.04835, Table 88).

Results of a single-factor ANOVA to detect differences in SCDHEC bioclassification values through time at the Monticello Reservoir raw water intake point are presented in Table 89. There was a significant difference (p-value = 0.00004) in SCDHEC bioclassification values through time at the Monticello Reservoir raw water intake point.

In order to determine which assessment had significant differences in SCDHEC bioclassification, a multiple comparison procedure consisting of additional single-factor ANOVAs was performed. The averages of the $\log_{10}(x+1)$ transformed SCDHEC bioclassification values are listed in ascending order in Table 90. Since the 18 September 2008 assessment had the highest average $\log_{10}(x+1)$ transformed SCDHEC bioclassification value, an ANOVA was performed without that assessment's data. The results of this ANOVA showed a significant difference in SCDHEC bioclassification values between the 18 June 2008, 23 January 2009, and 27 April 2009 assessments (p = 0.00755, Table 91). A third ANOVA was performed without the data from 27 April 2009. This ANOVA showed no significant difference between the 18 June 2008 and 23 January 2009 assessments (p-value = 0.20000, Table 92). A fourth ANOVA was performed to test whether the 18 September 2008 and 27 April 2009 assessments were significantly different. This ANOVA showed a significant difference between the 18 September 2008 and 27 April 2009 assessments (p-value = 0.01100, Table 93).

VI. DISCUSSION

There were no significant differences between the Parr Reservoir control and blowdown discharge points for the 27 April 2009 assessment

The Monticello Reservoir points showed significant differences for the 27 April 2009 assessment in four of the metrics measured as indicated by single factor ANOVA analysis. Taxa richness was all significantly greater at the water treatment intake point than at the other two points. EPT Index and EPT abundance were significantly higher at the raw water intake point. SCDHEC bioclassification was significantly lower at the control point.

At the Parr Reservoir control point, the taxa richness was significantly higher for the 23 January 2009 assessment than for the 18 June 2008, 18 September 2008, or 27 April 2009 assessments. There was no significant difference between these three assessments. There was no significant difference in taxa richness at the blowdown discharge point through time.

Total abundance showed no significant difference through time at either the Parr Reservoir control or blowdown discharge points.

At the Parr Reservoir control point, the percentage of the dominant taxon was significantly lower for the 22 January 2009 assessment than for the 18 June 2008, 18 September 2008, or 27 April 2009 assessments. There was no significant difference between these three assessments. At the blowdown discharge point, the percentage of the dominant taxon was significantly lower for the 18 September 2008 assessment than for the 18 June 2008, 22 January 2009, or 27 April 2009 assessments. There was no significant difference between these three assessments.

At the Parr Reservoir control point, EPT Index values were not significantly different through time. At the blowdown discharge point, the EPT Index value was significantly higher for the 18 September 2008 assessment than for the 18 June 2008, 22 January 2009, or 27 April 2009 assessments. There was no significant difference between these three assessments.

At the Parr Reservoir control point, EPT Abundance values were not significantly different through time. At the blowdown discharge point, the EPT Abundance value was significantly higher for the 18 September 2008 assessment than for the 18 June 2008, 22 January 2009, or 27 April 2009 assessments. There was no significant difference between these three assessments.

At the Parr Reservoir control point, the NCBI was significantly higher for the 22 January 2009 assessment than for the 18 June 2008, 18 September 2008, or 27 April 2009 assessments. There was no significant difference between these three assessments. There was no significant difference in NCBI at the blowdown discharge point through time.

At the Parr Reservoir control point, the SCDHEC Bioclassification value was significantly lower for the 22 January 2009 assessment than for the 18 June 2008, 18 September 2008, or 27 April 2009 assessments. There was no significant difference between these three assessments. There was no significant difference in SCDHEC Bioclassification values at the blowdown discharge point through time.

At the Monticello Reservoir control point, the taxa richness values were not significantly different through time. At the water treatment intake point, the taxa richness for the 18 June 2008 and 27 April 2009 assessments were significantly higher than for the 18 September 2008 or 23 January 2009 assessments. There was no significant difference in taxa richness for the 18 June 2008 and 27 April 2009 assessments. There also was no significant difference between the 18 September 2008 and 23 January 2009 assessments. At the raw water intake point, taxa richness was significantly higher for the 18 June 2008 assessment than for the 18 June 2008, 23 January 2009, or 27 April 2009 assessments. There was no significant difference between these three assessments.

Total abundance showed no significant difference through time at either the Monticello Reservoir control or raw water intake points. At the water treatment intake point, the total abundance for the 27 April 2009 assessment was significantly higher than for the 18 June 2008, 18 September 2008, or 23 January 2009 assessments. There was no significant difference between these three assessments.

The percentage of the dominant taxon showed no significant difference through time at either the Monticello Reservoir control or water treatment intake points. At the raw water intake point, the total abundance for the 18 June 2008 assessment was significantly lower than for the 18 September 2008, 23 January 2009 or 27 April 2009 assessments. There was no significant difference between these three assessments.

The EPT Index values showed no significantly different through time at either the Monticello Reservoir control or raw water intake points. At the water treatment intake point, the EPT Index for the 18 September 2008, 23 January 2009, and 27 April 2009 assessments were significantly lower than for the 18 June 2008 assessment. There was no significant difference in EPT Index for the 18 September 2008, 23 January 2009, and 27 April 2009 assessments.

The EPT Abundance values showed no significant difference through time at either the Monticello Reservoir control or raw water intake points. At the water treatment intake point, the EPT Abundance value for the 18 June 2008 assessment was significantly lower than for the 18 June 2008 23 January 2009, or 27 April 2009 assessments. There was no significant difference in EPT Abundance for these assessments.

The NCBI showed no significant difference through time at either the Monticello Reservoir control or water treatment intake points. At the raw water intake point, the NCBI values for the 18 June 2008 and 23 January 2009 assessments were significantly higher than for the 18 September 2008 or 27 April 2009 assessments. There was no significant difference in NCBI for the 18 June 2008 and 23 January 2009 assessments.

The NCBI value for the 27 April 2009 assessment was significantly higher than for the 18 September 2008 assessment.

The SCDHEC Bioclassification showed no significant difference through time at either the Monticello Reservoir control or water treatment intake points. At the raw water intake point, the SCDHEC Bioclassification values for the 18 June 2008 and 23 January 2009 assessments were significantly higher than for the 18 June 2008 or 27 April 2009 assessments. There was no significant difference in SCDHEC Bioclassification for the 18 June 2008 and 23 January 2009 assessments. The SCDHEC Bioclassification value for the 27 April 2009 assessment was significantly lower than for the 18 September 2008 assessment.

In conclusion, Parr Reservoir showed little, if any differences among the control and blowdown discharge points. At the control point, the assessment performed on 23 January 2009 was somewhat better than the other three assessments. At the blowdown discharge point, the 18 September 2008 assessment was slightly better than the other three assessments.

Monticello Reservoir also showed few differences among the control, water treatment intake or raw intake points. In addition, none of the assessments showed any large differences across time.

VII. REFERENCES

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Table 1. Macroinvertebrates, their NCBI tolerance values (TV) and functional feeding groups (FG) for the two Parr Reservoir points near the V. C. Summer Nuclear Station location, Fairfield County, South Carolina, 27 April 2009.

				Control					New Blowdown Discharge				
Seq	**Taxon**	**TV**	**FG**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Annelida													
Oligochaeta													
Tubificida													
Naididae													
1	Limnodrilus hoffmeisteri	9.47	SC				2	1		3	6		4
2	Naididae Genus species		SC	5	13	16	10	11	4	13	12	15	8
Arthropoda													
Insecta													
Diptera													
Ceratopogonidae													
3	Bezzia/Palpomyia sp.	6.86	P		1		2	1					
Chironomidae													
4	Chironomus sp.	9.63	CG		1				1	1			2
5	Clinotanypus sp.		P			1	1						
6	Cryptochironomus sp.	6.40	P	1									
7	Harnischia sp.	9.07	CG		2								
8	Polypedilum halterale gr.	7.31	SH				1						
9	Procladius sp.	9.10	P		1			1					
10	Thienemannimyia gr.	8.42	P			1							

Functional feeding groups: CF = collector-filterer, CG = collector-gatherer, OM = omnivore, P = predator, SC = scraper, SH = shredder

Table 1. Continued.

				Control					New Blowdown Discharge				
Seq	**Taxon**	**TV**	**FG**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Ephemeroptera													
Ephemeridae													
11	Hexagenia limbata	4.90	CG			1				1			
Mollusca													
Bivalvia													
Unionoida													
Corbiculidae													
12	Corbicula fluminea	6.12	CF	6	7	5	5	11	3	4	3	3	11

Functional feeding groups: CF = collector-filterer, CG = collector-gatherer, OM = omnivore, P = predator, SC = scraper, SH = shredder

Table 2. Macroinvertebrates, their NCBI tolerance values (TV) and functional feeding groups (FG) for three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.

				Control					New Water Treatment Intake					Raw Water Intake				
Seq	**Taxon**	**TV**	**FG**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Annelida																		
Hirudinea																		
1	Hirudinea Genus species		P													1	1	
Oligochaeta																		
Tubificida																		
Naididae																		
2	Branchiura sowerbyi	8.28	SC						1		1	1	1	1	1	1		1
3	Limnodrilus hoffmeisteri	9.47	SC			1					4							
4	Limnodrilus sp.	9.50	SC				1											
5	Naididae Genus species		SC	1			1	2	3		5	2					1	
Arthropoda																		
Copepoda																		
6	Copepoda Genus species		OM						1									
Insecta																		
Diptera																		
Chironomidae																		
7	Ablabesmyia annulata	2.04	P												1	2		
8	Chironomus sp.	9.63	CG		2	3	5	2		1		1	1					
9	Cladopelma sp.	3.49	CG						1	3	2		2		1			
10	Cladotanytarsus sp.	4.09	CG	2	1	18	3	5	10	8	14		8					
11	Clinotanypus sp.		P								1							

Functional feeding groups: CF = collector-filterer, CG = collector-gatherer, OM = omnivore, P = predator, SC = scraper, SH = shredder

Table 2. Continued.

				Control					New Water Treatment Intake					Raw Water Intake				
Seq	**Taxon**	**TV**	**FG**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Chironomidae cont.																		
12	Cryptochironomus sp.	6.40	P			2					1							
13	Dicrotendipes sp.	8.10	CG		1						1							
14	Nanocladius sp.	7.07	CG								1							
15	Orthocladius sp.	5.94	SH		2													
16	Phaenopsectra obediens gr.	6.50	SC											1				
17	Polypedilum halterale gr.	7.31	SH	1		2			9	3	15	1	8	1		1	2	1
18	Procladius sp.	9.10	P						1						1			
19	Rheotanytarsus exiguus gr.	5.89	CF		1				2		1		4					
20	Tanytarsus sp.	6.76	CF						2		1							
Ephemeroptera																		
Ephemeridae																		
21	Hexagenia limbata	4.90	CG											1	9	3	5	5
Mollusca																		
Bivalvia																		
Unionoida																		
Corbiculidae																		
22	Corbicula fluminea	6.12	CF	15	14	18	9	11	19	12	19	10	12	6	11	10	14	4
Unionidae																		
23	Pyganodon cataracta		CF											1				

Functional feeding groups: CF = collector-filterer, CG = collector-gatherer, OM = omnivore, P = predator, SC = scraper, SH = shredder

Table 2. Continued.

				Control					New Water Treatment Intake					Raw Water Intake				
Seq	**Taxon**	**TV**	**FG**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Gastropoda																		
Limnophila																		
Physidae																		
24	Physa sp.	8.84	SC						1			1						

Functional feeding groups: CF = collector-filterer, CG = collector-gatherer, OM = omnivore, P = predator, SC = scraper, SH = shredder

Table 3. Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.

	Station									
	Control					New Blowdown Discharge				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	3	6	5	6	5	3	5	3	2	4
Number of Specimens	12	25	24	21	25	8	22	21	18	25
EPT Index	0	0	1	0	0	0	1	0	0	0
EPT Abundance	0	0	1	0	0	0	1	0	0	0
Chironomidae Taxa	1	3	2	2	1	1	1	0	0	1
Chironomidae Abundance	1	4	2	2	1	1	1	0	0	2
EPT/Chironomidae Abundance	0.00	0.00	0.50	0.00	0.00	0.00	1.00	-	-	0.00
North Carolina Biotic Index	6.19	7.57	6.34	7.00	6.66	7.00	7.66	7.80	6.12	7.09
SCDHEC Bioclassification	2.0	1.0	2.0	1.5	1.5	1.5	1.0	1.0	2.0	1.5
Percent Collector-Filterers	50.00	28.00	20.83	23.81	44.00	37.50	18.18	14.29	16.67	44.00
Percent Collector-Gatherers	0.00	12.00	4.17	0.00	0.00	12.50	9.09	0.00	0.00	8.00
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Predators	8.33	8.00	8.33	14.29	8.00	0.00	0.00	0.00	0.00	0.00
Percent Scrapers	41.67	52.00	66.67	57.14	48.00	50.00	72.73	85.71	83.33	48.00
Percent Shredders	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00
Scraper/Scraper & Collector-Filterers	0.83	1.86	3.20	2.40	1.09	1.33	4.00	6.00	5.00	1.09
Percent Dominant Taxon	50.00	52.00	66.67	47.62	44.00	50.00	59.09	57.14	83.33	44.00
Number Of Dominant Taxa	3	3	2	4	2	3	3	3	2	4

Table 4. Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.

	Station														
	Control					New Water Treatment Intake					Raw Water intake				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	4	6	6	5	4	11	5	13	6	7	6	6	6	5	4
Number of Specimens	19	21	44	19	20	50	27	66	16	36	11	24	18	23	11
EPT Index	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
EPT Abundance	0	0	0	0	0	0	0	0	0	0	1	9	3	5	5
Chironomidae Taxa	2	5	4	2	2	6	4	9	2	5	2	3	2	1	1
Chironomidae Abundance	3	7	25	8	7	25	15	37	2	23	2	3	3	2	1
EPT/Chironomidae Abundance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	3	1	3	5
North Carolina Biotic Index	6.05	6.32	5.93	6.90	5.94	5.74	5.78	6.24	6.80	6.11	6.48	5.81	5.85	5.94	6.08
SCDHEC Bioclassification	2.0	2.0	2.0	1.5	2.0	2.3	2.3	2.0	1.5	2.0	1.8	2.2	2.0	2.0	2.0
Percent Collector-Filterers	78.95	71.43	40.91	47.37	55.00	2.00	0.00	3.03	6.25	2.78	9.09	8.33	16.67	0.00	9.09
Percent Collector-Gatherers	10.53	19.05	47.73	42.11	35.00	62.00	59.26	59.09	87.50	58.33	72.73	45.83	61.11	73.91	45.45
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Predators	0.00	0.00	4.55	0.00	0.00	6.00	0.00	3.03	6.25	0.00	0.00	4.17	0.00	0.00	0.00
Percent Scrapers	5.26	0.00	2.27	10.53	10.00	6.00	11.11	6.06	0.00	5.56	18.18	41.67	22.22	26.09	45.45
Percent Shredders	5.26	9.52	4.55	0.00	0.00	24.00	29.63	22.73	0.00	33.33	0.00	0.00	0.00	0.00	0.00
Scraper/Scraper & Collector-Filterers	0.07	0.00	0.06	0.22	0.18	3.00	-	2.00	0.00	2.00	2.00	5.00	1.33	-	5.00
Percent Dominant Taxon	78.95	66.67	40.91	47.37	55.00	38.00	44.44	28.79	62.50	33.33	54.55	45.83	55.56	60.87	45.45
Number Of Dominant Taxa	4	3	3	5	4	4	4	5	6	5	6	2	6	3	4

Table 5. Results of the single factor ANOVA to detect differences in taxa richness, total abundance, EPT index, EPT abundance, NCBI, and percentage of the dominant taxon among sampling points for the petite Ponar data collected on Parr Reservoir, near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 27 April 2009.

ANOVA for Taxa Richness

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0476	1	0.0476	4.1768	0.0752	5.3177
Within Stations	0.0912	8	0.0114			
Total	0.1389	9				

ANOVA for EPT Abundance

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0000	1	0.0000	0.0000	1.0000	5.3177
Within Stations	0.1450	8	0.0181			
Total	0.1450	9				

ANOVA for Total Abundance

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0110	1	0.0110	0.4410	0.5253	5.3177
Within Stations	0.2001	8	0.0250			
Total	0.2111	9				

ANOVA for NCBI

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0011	1	0.0011	0.9349	0.3619	5.3177
Within Stations	0.0090	8	0.0011			
Total	0.0101	9				

ANOVA for percentage of the dominant taxon

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0052	1	0.0052	0.6939	0.4290	5.3177
Within Stations	0.0598	8	0.0075			
Total	0.0650	9				

ANOVA for SCDHEC Bioclassification

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0031	1	0.0031	0.5690	0.4723	5.3177
Within Stations	0.0436	8	0.0054			
Total	0.0467	9				

ANOVA for EPT Index

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Stations	0.0000	1	0.0000	0.0000	1.0000	5.3177
Within Stations	0.1450	8	0.0181			
Total	0.1450	9				

Table 6. Results of the single-factor ANOVA to detect differences in taxa richness between points in Monticello Reservoir, 27 April 2009.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.09011	2	0.04506	3.97470	0.04737	3.88529
Within Stations	0.13603	12	0.01134			
Total	0.22614	14				

Table 7. Averages of the $\log_{10}(x+1)$ transformed taxa richness data in Monticello Reservoir, listed in ascending order.

Average Log (taxa richness + 1)			
Station	Control	Raw Intake	Water Treatment Intake
Average	0.77326	0.80248	0.95033

Table 8. Results of the single-factor ANOVA to detect differences in taxa richness between the control and raw water intake points in Monticello Reservoir, 27 April 2009.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00214	1	0.00214	0.44791	0.52217	5.31766
Within Stations	0.03814	8	0.00477			
Total	0.04027	9				

Table 9. Results of the single-factor ANOVA to detect differences in total abundance between points in Monticello Reservoir, 27 April 2009.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.24547	2	0.12273	3.65038	0.05776	3.88529
Within Stations	0.40347	12	0.03362			
Total	0.64893	14				

Table 10. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between points in Monticello Reservoir, 27 April 2009.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.05831	2	0.02915	2.78199	0.10171	3.88529
Within Stations	0.12575	12	0.01048			
Total	0.18406	14				

Table 11. Results of the single-factor ANOVA to detect differences in EPT Index values between points in Monticello Reservoir, 27 April 2009.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.30206	2	0.15103	65535	-	3.88529
Within Stations	0.00000	12	0.00000			
Total	0.30206	14				

Table 12. Averages of the $\log_{10}(x+1)$ transformed EPT Index data in Monticello Reservoir, listed in ascending order.

Average Log (EPT Index + 1)			
Station	Water Treatment Intake	Control	Raw Intake
Average	0.00000	0.00000	0.30103

Table 13. Results of the single-factor ANOVA to detect differences in EPT Abundance values between points in Monticello Reservoir, 27 April 2009.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	1.59565	2	0.79783	35.37317	0.00001	3.88529
Within Stations	0.27065	12	0.02255			
Total	1.86631	14				

Table 14. Averages of the $\log_{10}(x+1)$ transformed EPT Abundance data in Monticello Reservoir, listed in ascending order.

Average Log (EPT Abundance + 1)			
Station	Water Treatment Intake	Control	Raw Intake
Average	0.00000	0.00000	0.69188

Table 15. Results of the single-factor ANOVA to detect differences in NCBI values between points in Monticello Reservoir, 27 April 2009.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00034	2	0.00017	0.33930	0.71889	3.88529
Within Stations	0.00601	12	0.00050			
Total	0.00635	14				

Table 16. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between points in Monticello Reservoir, 27 April 2009.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01936	2	0.00968	4.13354	0.04309	3.88529
Within Stations	0.02811	12	0.00234			
Total	0.04747	14				

Table 17. Averages of the $\log_{10}(x+1)$ transformed SCDHEC bioclassification data in Monticello Reservoir, listed in ascending order.

Average Log (SCDHEC bioclassification + 1)			
Station	Control	Raw Intake	Water Treatment Intake
Average	0.40108	0.47673	0.47784

Table 18. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the the raw water intake and the water treatment intake points in Monticello Reservoir, 27 April 2009.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.000003	1	0.000003	0.00216	0.96409	5.31766
Within Stations	0.01138	8	0.00142			
Total	0.01138	9				

Table 19. Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 18 June 2008.

	Station									
	Control					New Blowdown Discharge				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	6	4	3	3	3	11	5	4	3	16
Number of Specimens	28	8	5	8	12	94	46	36	28	135
EPT Index	0	0	0	0	0	0	0	0	0	1
EPT Abundance	0	0	0	0	0	0	0	0	0	1
Chironomidae Taxa	3	2	0	2	1	5	3	3	3	7
Chironomidae Abundance	7	2	0	3	1	82	43	35	28	116
EPT/Chironomidae Abundance	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.01
North Carolina Biotic Index	8.15	6.85	7.08	6.04	7.81	6.66	5.84	6.11	5.84	6.35
SCDHEC Bioclassification	1.0	1.5	1.5	2.0	1.0	1.5	2.0	2.0	2.0	2.0
Percent Collector-Filterers	28.57	50.00	60.00	87.50	25.00	77.66	67.39	50.00	46.43	74.07
Percent Collector-Gatherers	14.29	12.50	0.00	12.50	8.33	3.19	13.04	19.44	32.14	4.44
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48
Percent Predators	7.14	12.50	0.00	0.00	0.00	9.57	15.22	30.56	21.43	4.44
Percent Scrapers	50.00	25.00	40.00	0.00	66.67	9.57	4.35	0.00	0.00	9.63
Percent Shredders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.93
Scraper/Scraper & Collector-Filterers	1.75	0.50	0.67	0.00	2.67	0.12	0.06	0.00	0.00	0.13
Percent Dominant Taxon	50.00	50.00	60.00	62.50	66.67	76.60	67.39	50.00	46.43	71.85
Number Of Dominant Taxa	6	4	3	3	3	2	3	3	3	3

Table 20. Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 18 September 2008.

	Station									
	Control					New Blowdown Discharge				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	4	2	5	3	7	3	5	7	6	8
Number of Specimens	43	22	16	42	23	14	29	44	42	46
EPT Index	1	0	0	0	1	1	1	2	1	2
EPT Abundance	1	0	0	0	1	3	5	4	2	6
Chironomidae Taxa	1	1	1	1	1	0	1	2	2	3
Chironomidae Abundance	5	1	4	4	3	0	2	2	2	3
EPT/Chironomidae Abundance	0.20	0.00	0.00	0.00	0.33	-	2.50	2.00	1.00	2.00
North Carolina Biotic Index	5.85	6.22	6.35	7.12	7.06	4.18	7.88	6.58	6.92	7.18
SCDHEC Bioclassification	2.0	2.0	2.0	1.5	1.5	3.0	1.0	1.5	1.5	1.5
Percent Collector-Filterers	83.72	95.45	50.00	78.57	39.13	35.71	27.59	40.91	42.86	36.96
Percent Collector-Gatherers	2.33	0.00	0.00	0.00	4.35	21.43	17.24	4.55	4.76	10.87
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Predators	13.95	4.55	31.25	9.52	26.09	42.86	17.24	38.64	38.10	15.22
Percent Scrapers	0.00	0.00	18.75	11.90	30.43	0.00	37.93	15.91	14.29	36.96
Percent Shredders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper/Scraper & Collector-Filterers	0.00	0.00	0.38	0.15	0.78	0.00	1.38	0.39	0.33	1.00
Percent Dominant Taxon	83.72	95.45	50.00	78.57	39.13	42.86	37.93	38.64	42.86	36.96
Number Of Dominant Taxa	2	1	5	3	3	3	5	3	3	4

Table 21. Bioassessment metrics for the two Parr Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 22 January 2009.

	Station									
	Control					New Blowdown Discharge				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	7	5	8	10	8	7	4	7	5	1
Number of Specimens	25	8	18	36	42	27	51	22	24	1
EPT Index	0	1	0	1	1	1	0	1	0	0
EPT Abundance	0	2	0	1	1	2	0	2	0	0
Chironomidae Taxa	2	1	3	3	3	2	1	2	1	0
Chironomidae Abundance	11	2	9	15	15	2	5	3	1	0
EPT/Chironomidae Abundance	0.00	1.00	0.00	0.07	0.07	1.00	0.00	0.67	0.00	-
North Carolina Biotic Index	9.15	8.91	9.26	7.67	7.20	7.59	7.21	7.55	7.56	6.22
SCDHEC Bioclassification	1.0	1.0	1.0	1.0	1.5	1.0	1.5	1.0	1.0	2.0
Percent Collector-Filterers	8.00	50.00	16.67	38.89	40.48	44.44	76.47	18.18	50.00	100.00
Percent Collector-Gatherers	0.00	25.00	22.22	11.11	7.14	7.41	9.80	4.55	0.00	0.00
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Predators	48.00	0.00	33.33	44.44	33.33	3.70	9.80	68.18	4.17	0.00
Percent Scrapers	44.00	25.00	27.78	5.56	19.05	40.74	3.92	9.09	45.83	0.00
Percent Shredders	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00
Scraper/Scraper & Collector-Filterers	5.50	0.50	1.67	0.14	0.47	0.92	0.05	0.50	0.92	0.00
Percent Dominant Taxon	32.00	25.00	22.22	36.11	40.48	44.44	76.47	50.00	50.00	100.00
Number Of Dominant Taxa	5	5	8	6	3	5	3	4	4	1

Table 22. Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 18 June 2008.

	Station														
	Control					New Water Treatment Intake					Raw water intake				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	6	13	8	6	6	6	5	5	5	6	6	15	5	11	10
Number of Specimens	32	63	35	13	13	13	10	15	16	20	18	42	15	18	18
EPT Index	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1
EPT Abundance	4	0	1	2	0	3	2	2	4	2	5	7	5	5	1
Chironomidae Taxa	3	9	4	3	3	2	3	3	3	3	3	7	2	8	6
Chironomidae Abundance	6	19	6	4	3	3	3	3	3	9	6	17	4	10	10
EPT/Chironomidae Abundance	0.67	0.00	0.17	0.50	0.00	1.00	0.67	0.67	1.33	0.22	0.83	0.41	1.25	0.50	0.10
North Carolina Biotic Index	6.58	7.46	7.12	5.83	8.05	5.58	6.40	6.30	5.16	6.27	6.47	6.36	7.08	6.62	7.36
SCDHEC Bioclassification	1.5	1.3	1.5	2.2	1.0	2.5	2.0	2.0	2.8	2.0	1.8	2.0	1.5	1.5	1.5
Percent Collector-Filterers	62.50	47.62	60.00	46.15	30.77	46.15	60.00	66.67	56.25	55.00	27.78	33.33	33.33	22.22	33.33
Percent Collector-Gatherers	15.63	6.35	2.86	30.77	7.69	23.08	30.00	26.67	31.25	15.00	38.89	38.10	53.33	44.44	22.22
Percent Omnivores	0.00	1.59	0.00	0.00	0.00	7.69	0.00	0.00	0.00	10.00	11.11	9.52	0.00	0.00	0.00
Percent Predators	21.88	14.29	2.86	7.69	15.38	23.08	10.00	6.67	12.50	20.00	22.22	16.67	13.33	27.78	38.89
Percent Scrapers	0.00	28.57	25.71	15.38	46.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.56
Percent Shredders	0.00	1.59	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38	0.00	5.56	0.00
Scraper/Scraper & Collector-Filterers	0.00	0.60	0.43	0.33	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
Percent Dominant Taxon	62.50	28.57	54.29	38.46	30.77	38.46	50.00	66.67	56.25	35.00	27.78	23.81	33.33	27.78	27.78
Number Of Dominant Taxa	5	5	3	6	6	6	5	5	5	6	6	5	5	11	10

Table 23. Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 18 September 2008.

	Station														
	Control					New Water Treatment Intake					Raw water intake				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	7	6	7	3	14	1	2	1	4	4	5	4	6	3	5
Number of Specimens	18	10	26	4	59	2	3	3	17	11	21	14	27	16	31
EPT Index	0	0	0	0	2	0	0	0	0	0	1	1	1	1	1
EPT Abundance	0	0	0	0	3	0	0	0	0	0	2	2	7	5	15
Chironomidae Taxa	1	3	4	1	6	0	1	0	2	1	2	1	2	0	1
Chironomidae Abundance	1	3	6	1	12	0	1	0	3	4	3	2	2	0	1
EPT/Chironomidae Abundance	0.00	0.00	0.00	0.00	0.25	-	0.00	-	0.00	0.00	0.67	1.00	3.50	-	15.00
North Carolina Biotic Index	6.39	6.98	7.02	9.00	6.52	6.22	6.22	6.22	6.66	6.90	6.00	5.20	5.41	4.18	3.37
SCDHEC Bioclassification	2.0	1.5	1.5	1.0	1.7	2.0	2.0	2.0	1.5	1.5	2.0	2.7	2.5	3.0	3.0
Percent Collector-Filterers	77.78	50.00	30.77	0.00	35.59	100.00	66.67	100.00	41.18	36.36	23.81	21.43	7.41	18.75	19.35
Percent Collector-Gatherers	0.00	10.00	0.00	0.00	3.39	0.00	0.00	0.00	0.00	0.00	9.52	14.29	25.93	31.25	48.39
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Predators	11.11	10.00	7.69	25.00	37.29	0.00	33.33	0.00	58.82	54.55	66.67	64.29	59.26	50.00	29.03
Percent Scrapers	11.11	30.00	53.85	75.00	23.73	0.00	0.00	0.00	0.00	9.09	0.00	0.00	7.41	0.00	3.23
Percent Shredders	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper/Scraper & Collector-Filterers	0.14	0.60	1.75	-	0.67	0.00	0.00	0.00	0.00	0.25	0.00	0.00	1.00	0.00	0.17
Percent Dominant Taxon	66.67	40.00	50.00	50.00	25.42	100.00	66.67	100.00	41.18	36.36	52.38	50	51.85	50	48.39
Number Of Dominant Taxa	7	6	4	3	6	1	2	1	4	4	4	4	4	3	3

Table 24. Bioassessment metrics for the three Monticello Reservoir points near the V. C. Summer Nuclear Station, Fairfield County, South Carolina, 23 January 2009.

	Station														
	Control					New Water Treatment Intake					Raw water intake				
Metric	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**	**Rep 1**	**Rep 2**	**Rep 3**	**Rep 4**	**Rep 5**
Taxa Richness	8	2	3	2	4	1	2	3	2	8	6	5	8	7	6
Number of Specimens	103	16	16	6	9	3	13	8	3	20	11	14	27	15	13
EPT Index	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
EPT Abundance	0	0	0	0	0	0	0	0	0	0	2	0	6	6	6
Chironomidae Taxa	3	0	1	1	2	0	1	1	0	4	2	1	3	3	3
Chironomidae Abundance	7	0	1	4	4	0	6	3	0	6	2	1	7	3	3
EPT/Chironomidae Abundance	0.00	-	0.00	0.00	0.00	-	0.00	0.00	-	0.00	1.00	0.00	0.86	2.00	2.00
North Carolina Biotic Index	7.86	6.99	6.79	6.05	8.14	6.22	6.22	6.76	7.30	6.81	6.87	7.90	6.69	6.84	6.49
SCDHEC Bioclassification	1.0	1.5	1.5	2.0	1.0	2.0	2.0	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.7
Percent Collector-Filterers	73.79	75.00	81.25	100.00	22.22	100.00	53.85	37.50	66.67	70.00	45.45	64.29	37.04	26.67	30.77
Percent Collector-Gatherers	0.00	0.00	6.25	0.00	44.44	0.00	0.00	0.00	0.00	0.00	18.18	7.14	29.63	40.00	61.54
Percent Omnivores	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Predators	7.77	0.00	0.00	0.00	0.00	0.00	46.15	37.50	0.00	20.00	27.27	0.00	11.11	6.67	7.69
Percent Scrapers	18.45	25.00	12.50	0.00	33.33	0.00	0.00	25.00	33.33	10.00	9.09	28.57	22.22	26.67	0.00
Percent Shredders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper/Scraper & Collector-Filterers	0.25	0.33	0.15	0.00	1.50	0.00	0.00	0.67	0.50	0.14	0.20	0.44	0.60	1.00	0.00
Percent Dominant Taxon	73.79	75.00	81.25	66.67	33.33	100.00	53.85	37.50	66.67	55.00	45.45	64.29	22.22	40.00	46.15
Number Of Dominant Taxa	2	2	3	2	4	1	2	3	2	8	6	5	6	7	6

Table 25. Results of the single-factor ANOVA to detect differences in taxa richness through time at the Parr Reservoir Control point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.20188	3	0.06729	4.71107	0.01531	3.23887
Within Stations	0.22855	16	0.01428			
Total	0.43043	19				

Table 26. Averages of the $\log_{10}(x+1)$ transformed taxa richness data at the Parr Reservoir Control point, listed in ascending order.

Average Log (taxa richness + 1)				
Station	18 Jun 2008	18 Sep 2008	27 Apr 2009	22 Jan 2009
Average	0.67005	069188	076971	092622

Table 27. Results of the single-factor ANOVA to detect differences in taxa richness between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.02745	2	0.01372	0.86101	0.44728	3.88529
Within Stations	0.19125	12	0.01594			
Total	0.21870	14				

Table 28. Results of the single-factor ANOVA to detect differences in total abundance through time at the Parr Reservoir Control point.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.44947	3	0.14982	3.17138	0.05300	3.23887
Within Stations	0.75588	16	0.04724			
Total	1.20535	19				

Table 29. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Parr Reservoir Control point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.30750	3	0.10250	9.13913	0.00093	3.23887
Within Stations	0.17945	16	0.01122			
Total	0.48695	19				

Table 30. Averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data at the Parr Reservoir Control point, listed in ascending order.

Average Log (percentage of the dominant taxon + 1)				
Station	22 Jan 2009	27 Apr 2009	18 Jun 2008	18 Sep 2008
Average	1.49734	1.7205	1.7667	1.82482

Table 31. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.02734	2	0.01367	1.21346	0.33117	3.88529
Within Stations	0.13521	12	0.01127			
Total	0.16255	14				

Table 32. Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Parr Reservoir Control point.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.09062	3	0.03021	1.66667	0.21404	3.23887
Within Stations	0.28998	16	0.01812			
Total	0.38060	19				

Table 33. Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Parr Reservoir Control point.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.12708	3	0.04236	1.89739	0.17075	3.23887
Within Stations	0.35719	16	0.02232			
Total	0.48427	19				

Table 34. Results of the single-factor ANOVA to detect differences in NCBI values through time at the Parr Reservoir Control point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.02816	3	0.00939	6.35558	0.00483	3.23887
Within Stations	0.02363	16	0.00148			
Total	0.05180	19				

Table 35. Averages of the $\log_{10}(x+1)$ transformed NCBI values at the Parr Reservoir Control point, listed in ascending order.

Average Log (NCBI + 1)				
Station	18 Sep 2008	27 Apr 2009	18 Jun 2008	22 Jan 2009
Average	0.87528	0.88854	0.91125	0.97310

Table 36. Results of the single-factor ANOVA to detect differences in NCBI values between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00331	2	0.00165	1.25652	0.31955	3.88529
Within Stations	0.01580	12	0.00132			
Total	0.01911	14				

Table 37. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Parr Reservoir Control point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.04266	3	0.01422	3.87978	0.02928	3.23887
Within Stations	0.05864	16	0.00366			
Total	0.10129	19				

Table 38. Averages of the $\log_{10}(x+1)$ transformed SCDHEC bioclassification values at the Parr Reservoir Control point, listed in ascending order.

Average Log (SCDHEC + 1)				
Station	22 Jan 2009	18 Jun 2008	27 Apr 2009	18 Sep 2008
Average	0.32041	0.37501	0.41023	0.44545

Table 39. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 June 2008, 18 September 2008, and 27 April 2009 assessments at the Parr Reservoir Control point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01240	2	0.00620	1.45568	0.27163	3.88529
Within Stations	0.05112	12	0.00426			
Total	0.06353	14				

Table 40. Results of the single-factor ANOVA to detect differences in taxa richness through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.17695	3	0.05898	1.43953	0.26832	3.23887
Within Stations	0.65558	16	0.04097			
Total	0.83253	19				

Table 41. Results of the single-factor ANOVA to detect differences in total abundance through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.88723	3	0.29574	2.60127	0.08798	3.23887
Within Stations	1.81908	16	0.11369			
Total	2.70631	19				

Table 42. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.11621	3	0.03874	3.66241	0.03499	3.23887
Within Stations	0.16923	16	0.01058			
Total	0.28544	19				

Table 43. Averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon data at the Parr Reservoir Blowdown Discharge point, listed in ascending order.

Average Log (percentage of the dominant taxon + 1)				
Station	18 Sep 2008	27 Apr 2009	22 Jan 2009	18 Jun 2008
Average	1.61038	1.76601	1.79321	1.79418

Table 44. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments at the Parr Reservoir Blowdown Discharge point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00256	2	0.00128	0.09260	0.91220	3.88529
Within Stations	0.16570	12	0.01381			
Total	0.16826	14				

Table 45. Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.33006	3	0.11002	6.05030	0.00592	3.23887
Within Stations	0.29094	16	0.01818			
Total	0.62100	19				

Table 46. Averages of the $\log_{10}(x+1)$ transformed EPT Index values at the Parr Reservoir Blowdown Discharge point, listed in ascending order.

Average Log (EPT Index + 1)				
Station	18 Jun 2008	27 Apr 2009	22 Jan 2009	18 Sep 2008
Average	0.06021	0.06021	0.12041	0.37147

Table 47. Results of the single-factor ANOVA to detect differences in EPT Index values between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments at the Parr Reservoir Blowdown Discharge point.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01208	2	0.00604	0.28571	0.75645	3.88529
Within Stations	0.25373	12	0.02114			
Total	0.26582	14				

Table 48. Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	1.30333	3	0.43444	13.82889	0.00010	3.23887
Within Stations	0.50265	16	0.03142			
Total	1.80598	19				

Table 49. Averages of the $\log_{10}(x+1)$ transformed EPT Abundance values at the Parr Reservoir Blowdown Discharge point, listed in ascending order.

Average Log (EPT Abundance + 1)				
Station	18 Jun 2008	27 Apr 2009	22 Jan 2009	18 Sep 2008
Average	0.06021	0.06021	0.19085	0.68028

Table 50. Results of the single-factor ANOVA to detect differences in EPT Abundance values between the 18 June 2008, 22 January 2009, and 27 April 2009 assessments at the Parr Reservoir Blowdown Discharge point.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01208	2	0.00604	0.28571	0.75645	3.88529
Within Stations	0.25373	12	0.02114			
Total	0.26582	14				

Table 51. Results of the single-factor ANOVA to detect differences in NCBI values through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01276	3	0.00425	1.53383	0.24420	3.23887
Within Stations	0.04435	16	0.00277			
Total	0.05711	19				

Table 52. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Parr Reservoir Blowdown Discharge point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.03346	3	0.01115	1.75501	0.19621	3.23887
Within Stations	0.10169	16	0.00636			
Total	0.13515	19				

Table 53. Results of the single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir Control point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.24525	3	0.08175	3.15942	0.05355	3.23887
Within Stations	0.41400	16	0.02588			
Total	0.65926	19				

Table 54. Results of the single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir Control point.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.12612	3	0.04204	0.35546	0.78587	3.23887
Within Stations	1.89235	16	0.11827			
Total	2.01847	19				

Table 55. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir Control point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.11105	3	0.03702	1.83123	0.18211	3.23887
Within Stations	0.32341	16	0.02021			
Total	0.43446	19				

Table 56. Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Monticello Reservoir Control point.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.11339	3	0.03780	2.07925	0.14331	3.23887
Within Stations	0.29086	16	0.01818			
Total	0.40425	19				

Table 57. Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir Control point.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.29272	3	0.09757	2.36391	0.10952	3.23887
Within Stations	0.66043	16	0.04128			
Total	0.95315	19				

Table 58. Results of the single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir Control point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00918	3	0.00306	1.61623	0.22500	3.23887
Within Stations	0.03030	16	0.00189			
Total	0.03948	19				

Table 59. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Monticello Reservoir Control point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.02103	3	0.00701	1.69379	0.20839	3.23887
Within Stations	0.06623	16	0.00414			
Total	0.08727	19				

Table 60. Results of the single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir New Water Treatment Intake point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.67221	3	0.22407	7.16997	0.00288	3.23887
Within Stations	0.50002	16	0.03125			
Total	1.17222	19				

Table 61. Averages of the $\log_{10}(x+1)$ transformed taxa richness data at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.

Average Log (Taxa Richness + 1)				
Station	18 Sep 2008	23 Jan 2009	18 Jun 2008	27 Apr 2009
Average	0.49542	0.56232	0.80493	0.95033

Table 62. Results of the single-factor ANOVA to detect differences in taxa richness between the 18 June 2008, 18 September 2008, and 23 January 2009 assessments at the Monticello Reservoir Water Treatment Intake point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.26522	2	0.13261	3.95722	0.04787	3.88529
Within Stations	0.40213	12	0.03351			
Total	0.66734	14				

Table 63. Results of the single-factor ANOVA to detect differences in taxa richness between the 18 September 2008 and 23 January 2009 assessments at the Monticello Reservoir Water Treatment Intake point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01119	1	0.01119	0.22555	0.64754	5.31766
Within Stations	0.39675	8	0.04959			
Total	0.40793	9				

Table 64. Results of the single-factor ANOVA to detect differences in taxa richness between the 18 June 2008 and 27 April 2009 assessments at the Monticello Reservoir Water Treatment Intake point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.05285	1	0.05285	4.09439	0.07764	5.31766
Within Stations	0.10327	8	0.01291			
Total	0.15612	9				

Table 65. Results of the single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir Water Treatment Intake point.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	1.66512	3	0.55504	7.78248	0.00199	3.23887
Within Stations	1.14111	16	0.07132			
Total	2.80622	19				

Table 66. Averages of the $\log_{10}(x+1)$ transformed total abundance data at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.

Average Log (Total Abundance + 1)				
Station	18 Sep 2008	23 Jan 2009	18 Jun 2008	27 Apr 2009
Average	0.80314	0.92534	1.18886	1.55589

Table 67. Results of the single-factor ANOVA to detect differences in total abundance between the 18 June 2008, 18 September 2008, and 23 January 2009 assessments at the Monticello Reservoir Water Treatment Intake point.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.38860	2	0.19430	2.51462	0.12244	3.88529
Within Stations	0.92721	12	0.07727			
Total	1.31581	14				

Table 68. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir Water Treatment Intake point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.11960	3	0.03987	1.70117	0.20688	3.23887
Within Stations	0.37495	16	0.02343			
Total	0.49455	19				

Table 69. Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Monticello Reservoir Water Treatment Intake point.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.33982	3	0.11327	65535	-	3.23887
Within Stations	0.00000	16	0.00000			
Total	0.33982	19				

Table 70. Averages of the $\log_{10}(x+1)$ transformed EPT Index values at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.

Average Log (EPT Index + 1)				
Station	18 Sep 2008	23 Jan 2009	27 Apr 2009	18 Jun 2008
Average	0.00000	0.00000	0.00000	0.30103

Table 71. Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir Water Treatment Intake point.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	1.11990	3	0.37330	146.48415	0.00000000001	3.23887
Within Stations	0.04077	16	0.00255			
Total	1.16067	19				

Table 72. Averages of the $\log_{10}(x+1)$ transformed EPT Abundance values at the Monticello Reservoir Water Treatment Intake point, listed in ascending order.

Average Log (EPT Abundance + 1)				
Station	18 Sep 2008	23 Jan 2009	27 Apr 2009	18 Jun 2008
Average	0.00000	0.00000	0.00000	0.54648

Table 73. Results of the single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir Water Treatment Intake point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00558	3	0.00186	2.58712	0.08912	3.23887
Within Stations	0.01150	16	0.00072			
Total	0.01708	19				

Table 74. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Monticello Reservoir Water Treatment Intake point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01958	3	0.00653	3.07018	0.05787	3.23887
Within Stations	0.03401	16	0.00213			
Total	0.05359	19				

Table 75. Results of the single-factor ANOVA to detect differences in taxa richness through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.16982	3	0.05661	4.72980	0.01510	3.23887
Within Stations	0.19149	16	0.01197			
Total	0.36131	19				

Table 76. Averages of the $\log_{10}(x+1)$ transformed taxa richness data at the Monticello Reservoir Raw Water Intake point, listed in ascending order.

Average Log (Taxa Richness + 1)				
Station	18 Sep 2008	23 Jan 2009	27 Apr 2009	18 Jun 2008
Average	0.74049	0.86514	0.80248	0.98959

Table 77. Results of the single-factor ANOVA to detect differences in taxa richness between the 18 September 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for Taxa Richness						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.03884	2	0.01942	3.36940	0.06897	3.88529
Within Stations	0.06917	12	0.00576			
Total	0.10802	14				

Table 78. Results of the single-factor ANOVA to detect differences in total abundance through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for Total Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.06401	3	0.02134	0.92332	0.45200	3.23887
Within Stations	0.36974	16	0.02311			
Total	0.43375	19				

Table 79. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.22079	3	0.07360	9.05370	0.00097	3.23887
Within Stations	0.13006	16	0.00813			
Total	0.35085	19				

Table 80. Averages of the $\log_{10}(x+1)$ transformed percentage of the dominant taxon values at the Monticello Reservoir Raw Water Intake point, listed in ascending order.

Average Log (Percentage of the Dominant Taxon + 1)				
Station	18 Jun 2008	23 Jan 2009	18 Sep 2008	27 Apr 2009
Average	1.46152	1.62679	1.71184	1.72524

Table 81. Results of the single-factor ANOVA to detect differences in percentage of the dominant taxon between the 18 September 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for Percentage of the Dominant Taxon						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.02851	2	0.01425	1.42448	0.27855	3.88529
Within Stations	0.12007	12	0.01001			
Total	0.14858	14				

Table 82. Results of the single-factor ANOVA to detect differences in EPT Index values through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for EPT Index						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01359	3	0.00453	1.00000	0.41824	3.23887
Within Stations	0.07250	16	0.00453			
Total	0.08609	19				

Table 83. Results of the single-factor ANOVA to detect differences in EPT Abundance through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for EPT Abundance						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.07012	3	0.02337	0.26295	0.85105	3.23887
Within Stations	1.42216	16	0.08889			
Total	1.49228	19				

Table 84. Results of the single-factor ANOVA to detect differences in NCBI values through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.06134	3	0.02045	9.76715	0.00067	3.23887
Within Stations	0.03350	16	0.00209			
Total	0.09484	19				

Table 85. Averages of the $\log_{10}(x+1)$ transformed NCBI values at the Monticello Reservoir Raw Water Intake point, listed in ascending order.

Average Log (NCBI + 1)				
Station	18 Sep 2008	27 Apr 2009	18 Jun 2008	23 Jan 2009
Average	0.75983	0.84683	0.89035	0.90002

Table 86. Results of the single-factor ANOVA to detect differences in NCBI values between the 18 June 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00803	2	0.00401	7.25637	0.00860	3.88529
Within Stations	0.00664	12	0.00055			
Total	0.01467	14				

Table 87. Results of the single-factor ANOVA to detect differences in NCBI values between the 18 June 2008 and 23 January 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00023	1	0.00023	0.33625	0.57796	5.31766
Within Stations	0.00555	8	0.00069			
Total	0.00579	9				

Table 88. Results of the single-factor ANOVA to detect differences in NCBI values between the 18 September 2008 and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for NCBI						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01892	1	0.01892	5.41712	0.04835	5.31766
Within Stations	0.02794	8	0.00349			
Total	0.04686	9				

Table 89. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values through time at the Monticello Reservoir Raw Water Intake point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.08465	3	0.02822	16.41686	0.00004	3.23887
Within Stations	0.02750	16	0.00172			
Total	0.11215	19				

Table 90. Averages of the $\log_{10}(x+1)$ transformed SCDHEC Bioclassification values at the Monticello Reservoir Raw Water Intake point, listed in ascending order.

Average Log (SCDHEC Bioclassification + 1)				
Station	23 Jan 2009	18 Jun 2008	27 Apr 2009	18 Sep 2008
Average	0.38524	0.42362	0.47673	0.55870

Table 91. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 June 2008, 23 January 2009, and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.02111	2	0.01055	7.54745	0.00755	3.88529
Within Stations	0.01678	12	0.00140			
Total	0.03789	14				

Table 92. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 June 2008 and 23 January 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.00368	1	0.00368	1.95107	0.20000	5.31766
Within Stations	0.01510	8	0.00189			
Total	0.01878	9				

Table 93. Results of the single-factor ANOVA to detect differences in SCDHEC Bioclassification values between the 18 September 2008 and 27 April 2009 assessments at the Monticello Reservoir Raw Water Intake point.

ANOVA for SCDHEC Bioclassification						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Stations	0.01680	1	0.01680	10.83465	0.01100	5.31766
Within Stations	0.01240	8	0.00155			
Total	0.02920	9				