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TENNESSEE VALLEY AUTHORITY

Office of Natural Resources and Economic Development
Division of Air and Water Resources

PREOPERATIONAL ASSESSMENT OF WATER QUALITY AND BIOLOGICAL RESOURCES OF CHICKAMAUGA RESERVOIR, WATTS BAR NUCLEAR PLANT, 1973-1985

December 1986

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1996

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*Appendices are available as a separate volume and may be obtained upon request.

EXECUTIVE SUMMARY

As required by the National Pollutant Discharge Elimination System Permit (TN0020168) for operation of Watts Bar Nuclear Plant (WBN), this report is a composite evaluation of nonradiological preoperational aquatic monitoring conducted from 1973 through 1979 and from 1982 through 1985. Baseline biological, physical, and water quality conditions in Chickamauga Reservoir in the vicinity of WBN are described. The following biological components are included: plankton, periphyton, benthic macroinvertebrates, fish eggs and larvae, and juvenile and adult fish. Because Sequoyah Nuclear Plant (SQN) also is located on Chickamauga Reservoir, results of various aspects of preoperational and operational monitoring for SQN are integrated in this report to provide a more comprehensive assessment of reservoir-wide conditions.

Water quality in the vicinity of WBN, while generally satisfactory, was influenced by discharges from Watts Bar Dam, located upstream approximately 2 miles. Typically, hydropower releases (25,000-45,000 cfs) from the dam inhibited stratification and establishment of a thermocline during summer in the upper 30 miles of Chickamauga Reservoir. However, releases from Watts Bar Dam, which reflect water quality in Watts Bar Reservoir and upstream tributary reservoirs, showed periodic deficiencies in dissolved oxygen (<5.0 mg/L) during May through September throughout the preoperational monitoring period. As a result of a prolonged drought, this condition was worse in 1985 than in previous years.

Although numerous spatial and temporal variations in the biotic community were identified during preoperational monitoring, none appeared

to be directly related to fluctuations in dissolved oxygen. Spatial analyses indicated that river flow was the dominant factor influencing abundance and/or occurrence of macroinvertebrates, phytoplankton, and zooplankton in the vicinity of WBN. Periphyton and ichthyoplankton (fish eggs and larvae) also were affected. The ichthyoplankton assemblage in WBN vicinity represented eggs and larvae spawned primarily in Watts Bar Reservoir and exposed to passage through the turbines at Watts Bar Dam. To a lesser extent, flow influenced relative abundance and species composition of juvenile and adult fish in netting and electrofishing samples at two stations in the plant vicinity.

Temporal analyses showed that seasonal and yearly changes in abundance and other variables for all component populations, except freshwater mussels, were common. The freshwater mussel population in the vicinity of WBN is quite old and most of the 30 found species may not have reproduced successfully in the past 40 years. Abundance trends for several communities (macroinvertebrates, plankton, and periphyton) were more cyclic than linear, indicating that preoperational monitoring for WBN covered a wide range of flow and climatic conditions. Also cyclic trends in the harvest of some fish species (e.g., white crappie) were noted in the reservoir-wide creel survey. Largemouth bass harvest, however, showed a significant linear increase. Total fishing pressure on Chickamauga Reservoir has increased dramatically since 1973. Some increasing and some decreasing trends were noted among important fish species in cove rotenone samples since 1970; however, total fish biomass remained relatively stable. The overriding influence on standing stock estimates for many of the important fish species was attributed to habitat alteration due to a large increase in aquatic vegetation in shallow overbank and cove areas of Chickamauga Reservoir.

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1.0 INTRODUCTION

The Tennessee Valley Authority (TVA), a corporate agency of the United States Government, announced in May 1971 plans to build a two-unit nuclear power plant in Rhea County, Tennessee. In accordance with the National Environmental Policy Act of 1969 (NEPA), TVA prepared a draft Environmental Impact Statement (EIS) which was sent to the Council on Environmental Quality (CEQ), made available to the public, and circulated to other governmental agencies for review and comment on May 14, 1971. Supplements and additions to the draft EIS were sent to the CEQ and made available to the public on April 7, 1972. TVA's Final EIS was sent to the CEQ and made available to the public on November 9, 1972. The Atomic Energy Commission (predecessor of the Nuclear Regulatory Commission) issued Construction Permits Nos. CPPR-91 and CPPR-92 for the Watts Bar Nuclear Plant (WBN) on January 23, 1973. The U.S. Nuclear Regulatory Commission (NRC) issued its Final Environmental Statement in December 1978.

1.1 Purpose and Objective

In accordance with the National Pollutant Discharge Elimination System (NPDES) permit (TN0020168) for operation of WBN by TVA, this report includes results of the nonradiological preoperational aquatic monitoring program for the period February 1973 through December 1985. The purpose of preoperational monitoring is to provide baseline data on the fisheries, limnology, and water quality of Chickamauga reservoir for comparison with conditions following startup and operation of WBN. These comparisons will be used to identify potential impacts of withdrawal and discharge of water at WBN. Both spatial and temporal variations in biological and water quality conditions in the vicinity of WBN as well as in the far-field zone of the reservoir for selected parameters are evaluated.

Preoperational aquatic monitoring for WBN has been divided into two periods, 1973 to 1979 and 1982 to 1985. Results of the first phase were reported to the U.S. Environmental Protection Agency (EPA) in two documents, fisheries (TVA 1980a) and water quality/aquatic biology (nonfish) (TVA 1980b). Due to various delays in construction and fuel-loading, a second period of monitoring was conducted from March 1982 through December 1985 to update the data base. This report provides a composite analysis of biological and water quality conditions for both periods. Because the Sequoyah Nuclear Plant (SQN) also is located on Chickamauga Reservoir, results of various aspects of the preoperational and operational aquatic monitoring program for SQN are integrated in the WBN preoperational evaluation for a more comprehensive assessment of reservoir-wide conditions.

1.2 Watts Bar Nuclear Plant Description

Watts Bar Nuclear Plant (WBN) is located on the right bank (west) of Chickamauga Reservoir near Tennessee River Mile (TRM) 528. This two-unit nuclear generating plant is designed for an electrical output of about 2,540 megawatts (MWe). WBN is situated approximately two miles downstream of Watts Bar Dam (TRM 529.9) and one mile downstream of the four-unit Watts Bar Fossil Plant (WBF) that is also on the right bank of Chickamauga Reservoir (TRM 529). WBF was decommissioned on March 29, 1983, and it was off line all of 1982. Figure 1-1 shows the locations of these TVA facilities.

WBN will be operated in closed cycle cooling mode, using two natural draft cooling towers for heat dissipation. Blowdown from the cooling towers will be discharged through multiport diffusers located in the main channel at TRM 527.8. Makeup water and other water supply requirements will be obtained from an intake channel and pumping station at TRM 528. These intake and discharge structures are indicated in figure 1-1.

Maximum intake pumping flowrate is approximately 4.5 m^3/s (160 cfs). The intake channel cross section opening is approximately 155 m^2 (1,650 ft^2) at Chickamauga Reservoir winter pool elevation of 206 m (675 ft) mean sea level, and 293 m^2 (3,159 ft^2) at summer pool level of 208 m (682.5 ft). Corresponding average velocities into the intake channel are .03 m/s (.1 ft/s) and .015 m/s (.05 ft/s). Four gates lead to the traveling screens with a combined opening of 33 m^2 (360 ft^2), so the maximum screen velocity is approximately .15 m/s (0.5 ft/s). This pumping flowrate represents about 0.6 percent of the long-term average flow past WBN of 767 m^3/s (27,100 cfs).

Blowdown from the cooling towers will be discharged at a rate of between 1.3 and 2.4 m^3/s (45 and 85 cfs) to maintain concentrations of dissolved solids at approximately twice that of the Tennessee River. Blowdown is discharged directly to the diffuser or into a holding pond which in turn releases water through the diffusers. During periods of no releases from Watts Bar Dam, discharges will be stored in the holding pond. Releases for normal two-unit operation will be 2.4 m^3/s (85 cfs). Even with additional releases from the blowdown holding pond, releases through the diffuser will in all cases be less than 5.0 m^3/s.

The diffuser system consists of two pipes extending into the main channel. The downstream pipe segment extends 90 m into the channel with a 50 m long, 1.35 m diameter diffuser section location in the deepest portion (5 or 6 m) of the 400 m wide channel. The upstream pipe segment extends 140 m with a 25 m long, 1.0 m diameter diffuser section beginning where the downstream diffuser section ends. The diffuser sections are half buried in the river bottom with two rows of 2.5 cm (1 in) diameter ports at 7.5 m (25 ft) spacing oriented at 45° in the downstream direction. The exit jet velocity will vary depending on operational mode, from 2 to 5 m/s. The expected discharge temperature depends on cooling tower performance and varies from 17°C in January to 35°C in July. The maximum blowdown temperature is 35°C, so the expected monthly average temperature difference between the discharge and the river varies from 10°C during winter and spring to 5°C during summer and fall. The diffuser system will result in a near-field dilution of at least 15. Far-field mixing will depend on releases from Watts Bar Dam. At the long-term average release, maximum diffuser discharge represents 0.6 percent of reservoir flow.

1.3 Chickamauga Reservoir Description

Chickamauga Reservoir is formed by Chickamauga Dam, located 57 river miles downstream of WBN at TRM 471. Water elevation normally varies from 205.7 m (675 ft) msl in winter to 208 m (682.5 ft) in summer. Reservoir volume is 465 x $10^6 m^3$ (375,000 Ac-ft) at elevation 206 m during winter and 735 x $10^6 m^3$ (600,000 Ac-ft) at elevation 208 m during summer. Figure 1-2 shows Chickamauga Reservoir in profile and approximately cumulative volume from Watts Bar Dam. The Hiwassee River joins the Tennessee River at TRM 500 and Chickamauga Reservoir extends 52 km (32 miles) up the Hiwassee River at surface elevation 208 m. The confluence of the Hiwassee River with the Tennessee River is near the downstream extent of WBN aquatic monitoring stations and provides a convenient reference point. Chickamauga Reservoir can be segmented into three regions as follows: (1) upstream of the Hiwassee River confluence, where Chickamauga Reservoir volume is 160 x $10^6 m^3$ at elevation 208 m (22 percent of total), (2) the Hiwassee segment of the reservoir which has a volume of 50 x $10^6 m^3$ (7 percent of total), (3) and the downstream segment from Hiwassee River confluence to Chickamauga Dam with a volume of 525 x $10^6 m^3$ (71 percent of total). Figure 1-3 shows the upstream segment of Chickamauga Reservoir in profile and the cumulative volume from Watts Bar Dam for this reach. Depths range from 5 m at WBN during winter to 14 m in deep portions of the channel during summer.

Figure 1-4 shows cross sections at several locations in the upstream portion of Chickamauga Reservoir. Areas are 1395 to 2320 m^2 (15,000 to 25,000 ft^2) in winter and 1860 to 3720 m^2 (20,000 to 40,000 ft^2) in summer. When all five hydropower units at Watts Bar Dam are generating at full capacity, releases are 1275 m^3/s (45,000 cfs), so average velocities in the upstream portion of Chickamauga Reservoir are 0.3 to 0.6 m/s (1 to 2 ft/s) in summer and 0.6 to 0.9 m/s (2 to 3 ft/s) in winter.

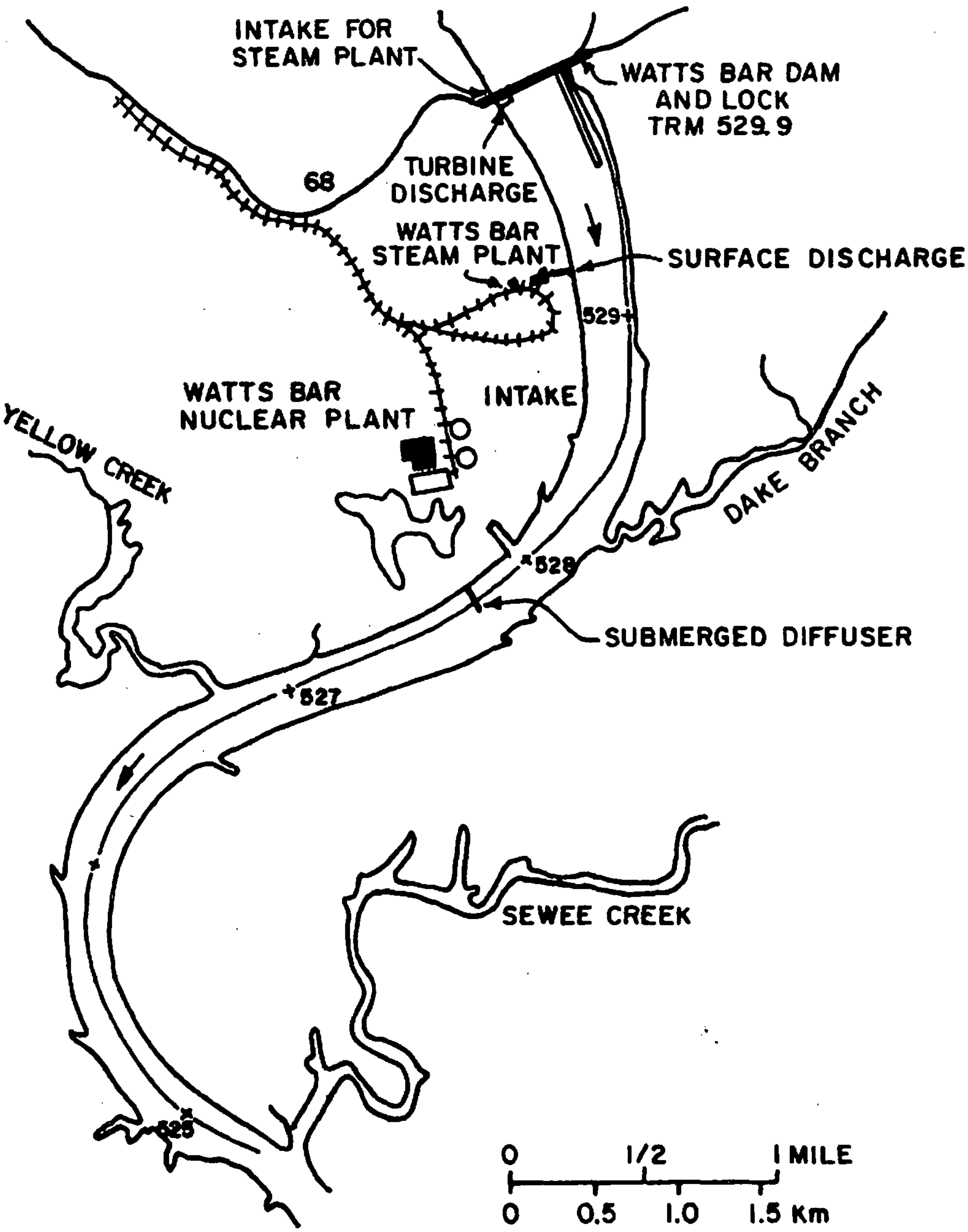


Figure 1-1. Location of Watts Bar Nuclear Plant in Chickamauga Reservoir.

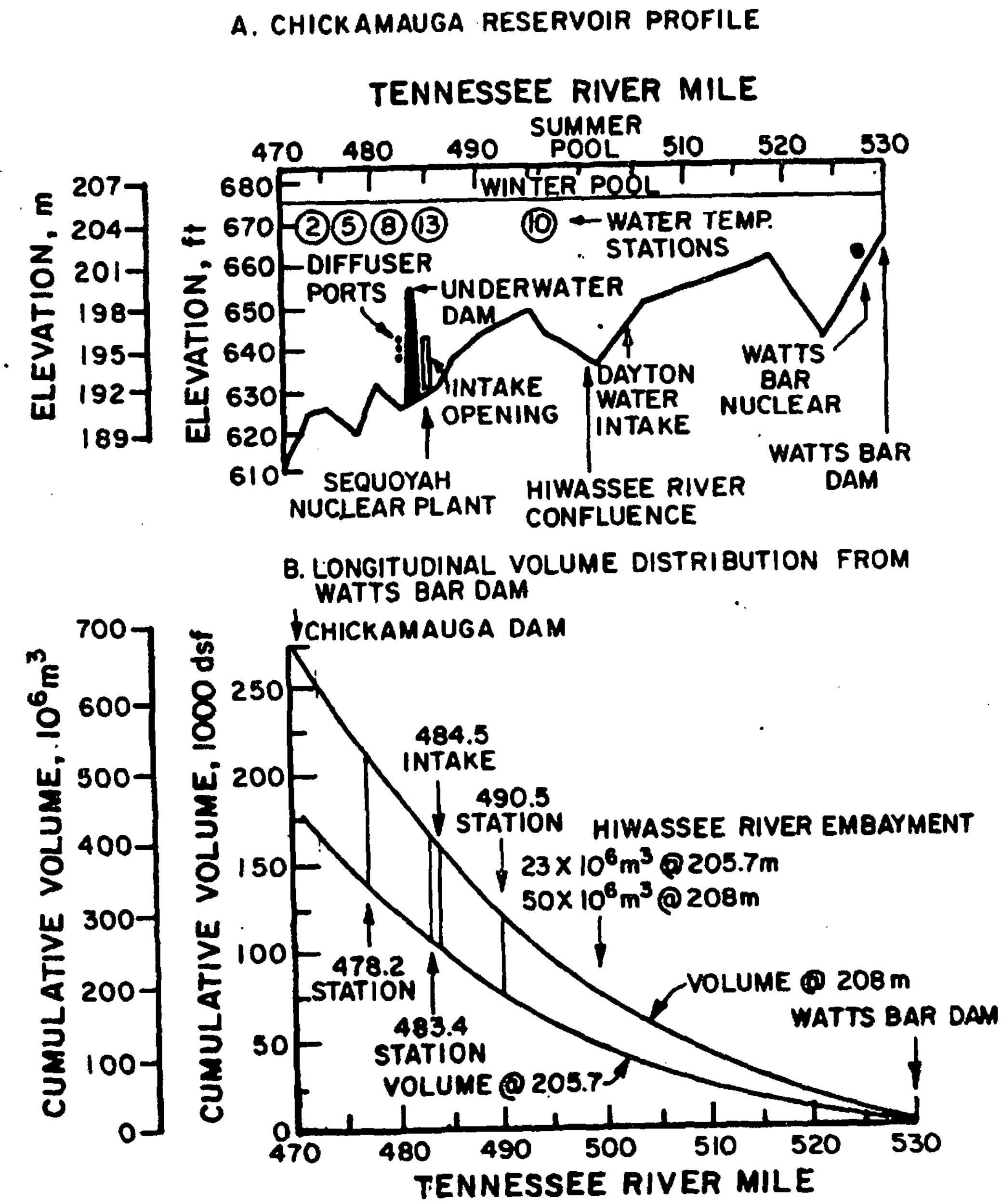
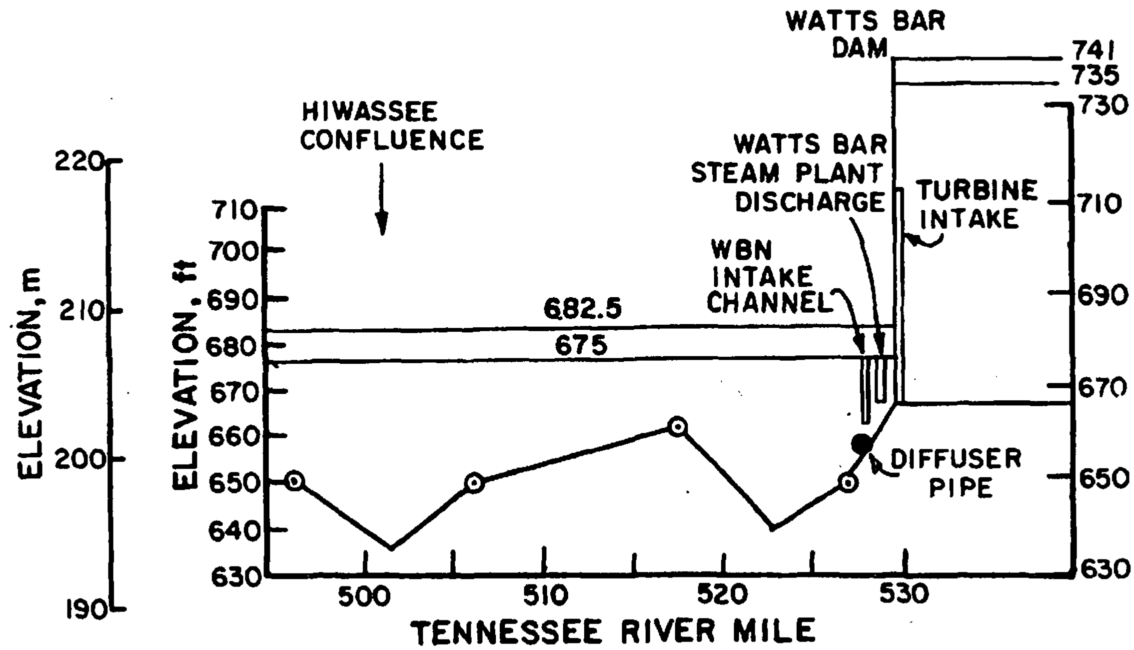


Figure 1-2. Chickamauga Reservoir Profile and Cumulative Volume From Watts Bar Dam.



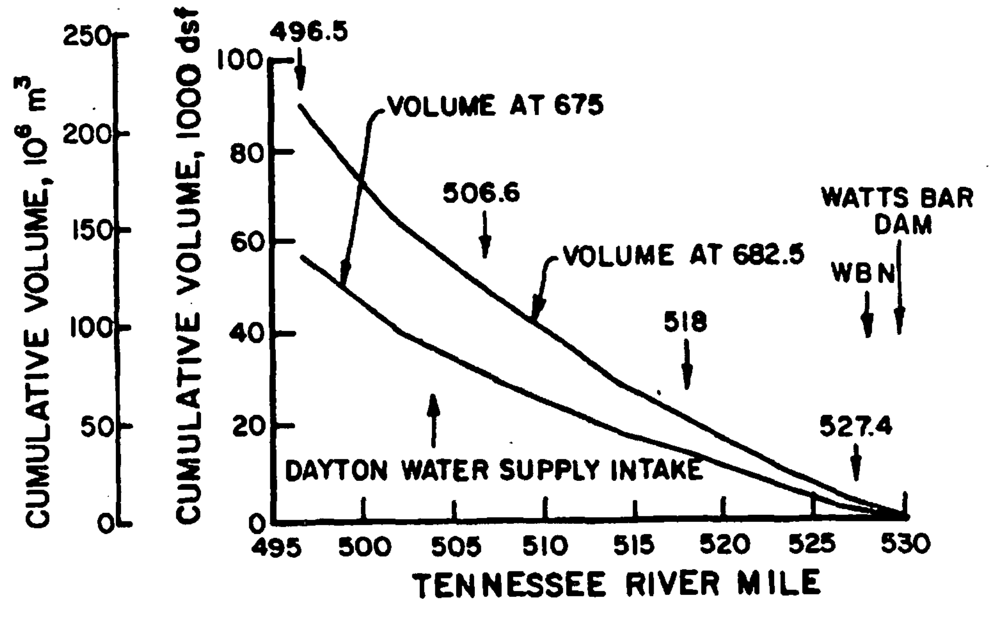


Figure 1-3. Upstream Portion of Chickamauga Reservoir Profile and Cumulative Volume From Watts Bar Dam.

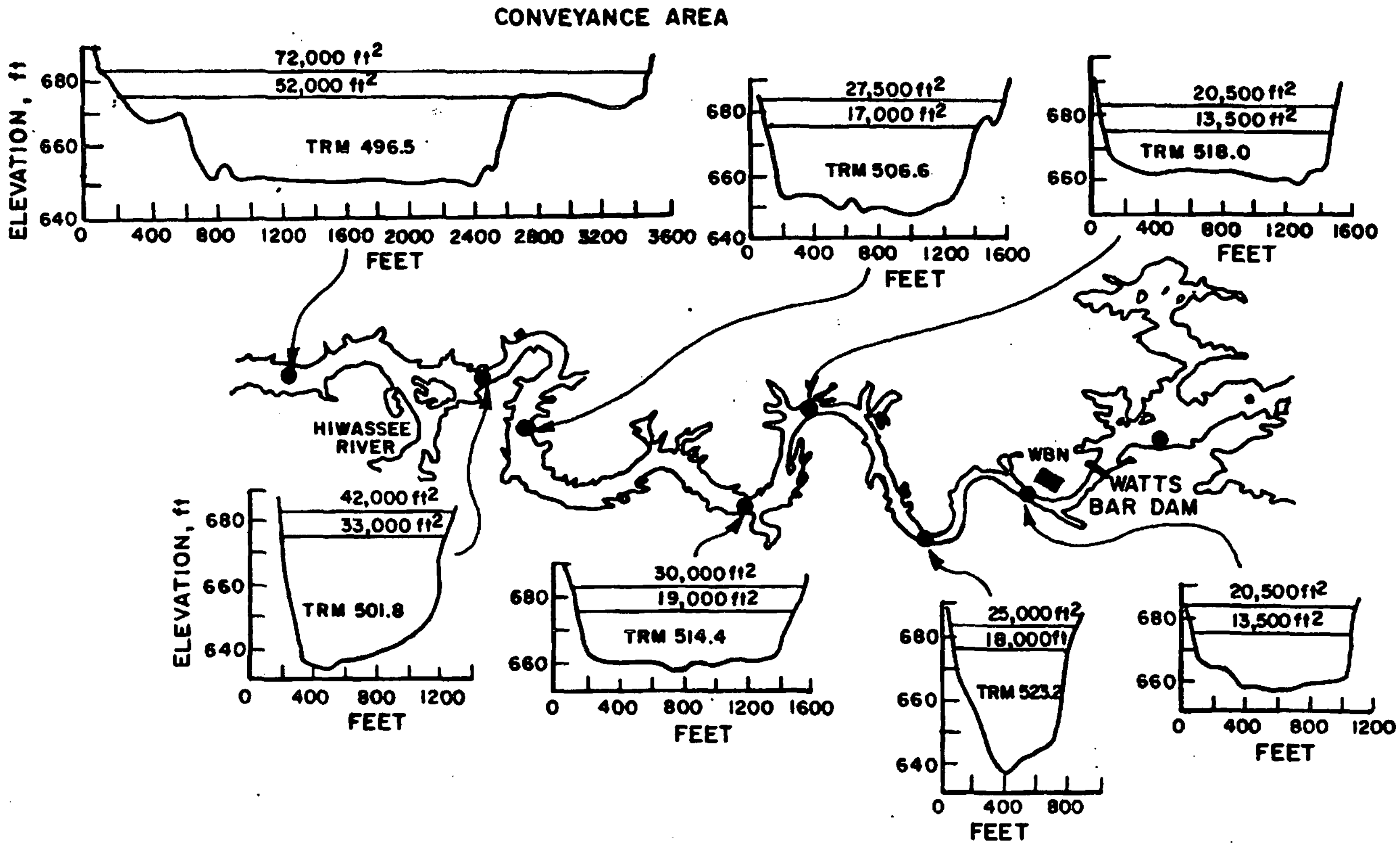


Figure 1-4. Channel Cross Sections in Upstream Portion of Chickamauga Reservoir.

2.0 ENVIRONMENTAL CONDITIONS DURING AQUATIC MONITORING PERIOD

Evaluation of possible effects from WBN operations on aquatic organisms begins with a characterization of major environmental influences on the aquatic environment in the vicinity of WBN. These include reservoir flow and travel time, temperature gradients and mixing, available light and nutrients, and suspended sediment conditions.

2.1 Flow and Travel Time

Travel time from release at Watts Bar Dam governs the time available for biological growth and decay processes as water moves past WBN and through the Chickamauga Reservoir. Although releases from Watts Bar Dam dominate the flows at WBN, two other water sources may be biologically significant. First, there are several small backwater areas and creek embayments throughout the upper 30 miles of the reservoir that may be sources of plankton during high reservoir flow. Peaking power releases produce some change in water surface levels downstream of Watts Bar Dam which leads to exchange with these embayments. Second, local runoff following heavy rainfall can have an effect on water quality.

Watts Bar Hydropower Plant consists of five turbines with a total discharge of approximately 1275 m^3/s (45,000 cfs). The units can operate efficiently at lower flows so that releases vary typically from 710 to 1275 m^3/s (25,000 to 45,000 cfs). The hydropower plant usually operates for 14 to 24 hours a day, supplying power during periods of peak demand. During flood control operations, spillway flows increase the releases above 1275 m^3/s (45,000 cfs).

The long-term average release since closure of Watts Bar Dam (1942) is about 767 m^3/s (27,100 cfs). The flow pattern which changes seasonally and from year-to-year reflects variability in runoff and upstream reservoir operations. Figure 2-1 shows the monthly flows during WBN aquatic monitoring period, 1973-1985. Highest flows normally occur in December through March, but the seasonal pattern is variable. Year-to-year differences are also large, with some years having uniform flow throughout the year (1976, 1984) and other years having more variable patterns (1974, 1975, 1982). During spring, flows are often reduced as upstream tributary reservoirs are filled (1976, 1978, 1981, 1982), but this does not always occur. The WBN aquatic monitoring samples are taken quarterly and the daily flows for particular dates are shown by circles in figure 2-1. These sample date flows are usually representative of seasonal conditions.

Travel time to various downstream locations can be estimated from the releases and the cumulative volume from Watts Bar Dam (shown in figure 1-3). At the long-term average flow of 767 m^3/s (27,100 cfs), water moves in one day past WBN to TRM 515 in summer and to TRM 508 in winter. The cumulative volume from Watts Bar Dam to the monitoring station at TRM 497.0 is approximately $150x10^6m^3$ during winter and $220x10^6m^3$ during summer, requiring two days travel in winter and three days in summer at the long-term average flow of 767 m^3/s (27,100 cfs).

Average velocity can be calculated from the Watts Bar Dam release and the cross section area. But as figure 2-2 indicates, velocities are considerably slower in overbank areas and along the channel bottom and sides. Velocities are 50 percent higher than average in the middle of the main channel. This also means that travel times are shorter in the main channel and longer in the shallow areas. The channel bends in the upstream portion of Chickamauga Reservoir produce additional lateral mixing and circulation. These factors of high flows, small cross sections, and channel bends create conditions of fully-mixed flow upstream of Hiwassee River confluence.

2.2 Temperatures and Mixing

Water temperatures near WBN are moderated by upstream reservoirs, but year-to-year variations in meteorology produce some fluctuations in the seasonal water temperature pattern. Figure 2-3 shows the seasonal temperature pattern with data from 1970-1985. Greatest variability occurs in winter, when temperatures can remain near 10°C or drop to near 2°C, and during summer when temperatures can remain below 25°C or approach 28°C. The effects of meteorological conditions on water temperatures and mixing can be identified from data collected by the temperature monitor #10 located at TRM 497.0. Stratification rarely occurs as fully-mixed conditions normally occur upstream from this point. The Watts Bar Fossil Plant, located at TRM 529, discharged 600 cfs with a temperature rise of approximately 2°C throughout much of the first phase of the WBN preoperational period. The Watts Bar Fossil Plant is no longer operating.

Because flow and temperatures are the dominant characteristics of the habitat in most of the WBN monitoring area, the daily patterns for 1973 through 1985 are shown in figure 2-4 through 2-16 for reference. As can be seen in figures 2-4 through 2-16, measurements taken at Watts Bar Dam are representative of the monitoring area. Measurements taken at water temperature monitor #13 (TRM 484.7, intake at Sequoyah Nuclear Plant) are shown in figures 2-15 and 2-16. The bottom temperature at station 13 also provides a good indication of temperatures in the vicinity of WBN.

2.3 Available Light

Primary productivity of phytoplankton and aquatic macrophytes depends on available solar energy which in turn depends on solar radiation and light penetration (turbidity). Day-to-day variations in light conditions are great, but these variations may not be reflected in average seasonal condiitons. Interpretation of productivity data should reflect these differences. Light penetration generally increases downstream as suspended solids settle after release from Watts Bar Dam. Depth of one percent surface light penetration varies from 3 to 5 m, unless water turbidity is unusually high or low. Turbidity and light conditions on sample dates are reported in appendix 2-A.

2.4 Seasonal Dissolved Oxygen and Nutrients

Dissolved oxygen concentrations in releases from Watts Bar Dam generally follow the seasonal saturation pattern with some additional DO deficit during low flow periods in spring and summer. Figure 2-3 shows the variability that occurs year-to-year. During some summers, DO concentrations approach 3 mg/L, while during other years, DO concentrations remain above 5 mg/L. Dissolved oxygen conditions are discussed in further detail in section 4.0.

The seasonal patterns for other water quality parameters are not as pronounced as for dissolved oxygen. Available data (1960 to 1985) from TRM 529.9 have been displayed as monthly means in figure 2-17. Turbidity is generally highest in winter and spring (15 to 20 NTU) and lowest in summer and fall (7 to 10 NTU). Alkalinity is generally slightly higher during the summer low flow period. Ammonia (not shown on figure) is generally low, about 0.05 mg/L. Nitrate (NO_3-N) is highest in winter (0.5 mg/L) and drops to between 0.2 and 0.3 mg/L during summer, reflecting algal uptake in Watts Bar and upstream reservoirs. Total phosphorus concentrations are variable, but are generally higher during winter and spring (0.03 mg/L) than summer and fall (0.02 mg/L). These represent the important nutrients for phytoplankton growth and are apparently available in excess of algal requirements.

2.5 Conditions Prior to Quarterly Plankton Sampling

Environmental factors during and prior to each plankton sampling are tabulated in appendix 2-A. Daily average Watts Bar Dam releases, solar radiation, water turbidity, rainfall, and windspeed are the physical factors reported. These are expected to influence all sampling stations. Travel time, temperature, DO, pH, alkalinity, secchi depth (light penetration), and nutrient measurements at each of the seven sampling stations are averaged over depth to describe overall conditions. As described previously, travel time through the upstream portion of Chickamauga Reservoir varies from less than one day to several days during low flow periods.

Water quality data in Chickamauga Reservoir in the early 1970s were mostly sparse and incomplete; these data were collected mainly for long-term reservoir water quality assessment. Available data in the late 1970s and early 1980s were more extensive and detailed enough for an overall analysis of environmental conditions during and prior to WBN aquatic sampling. The influence of these environmental factors on plankton productivity will be discussed in section 5.0. A synopsis of the available data (shown in appendices A-1 to A-35) is summarized in table 2-1. This table identifies differences observed in environmental conditions prior to plankton sampling. Measurements of environmental factors in the same period (i.e., February, May, August, and November) are divided into three categories: low, middle, and high. For each environmental factor, a range of values is assigned to each category with the attributive year(s).

<u>February Conditions</u>--Conditions during the quarterly sampling periods are summarized in table 2-1. River flows during February (1975-1985) are generally between 20,000 and 30,000 cfs with an average travel time through the monitoring area (TRM 496-532) of 1.5 days. February temperatures range from 5 to 10°C and dissolved oxygen concentrations are between 10 and 12 mg/L. Because of well-mixed conditions, little variation in chemical parameters exists among stations or with depth.

<u>May Conditions</u>--River flows during May (1975-1985) are between 20,000 and 30,000 cfs with an average travel time through the monitoring reach (TRM 496-532) of 3.7 days. May temperatures range from 15 to 20°C, dissolved oxygen concentrations are between 7 and 9 mg/L, and the reservoir is well mixed.

August Conditions--River flows during August (1975-1985) are between 30,000 and 35,000 cfs with an average travel time through the monitoring reach (TRM 496-532) of 3.1 days. August temperatures range from 24 to 26°C and dissolved oxygen concentrations are normally between 4 and 5 mg/L.

November Conditions--River flows during November (1975-1985) are between 20,000 and 25,000 cfs with an average travel time through the monitoring reach (TRM 496-532) of 2.3 days. November temperatures range from 15 to 16°C and dissolved oxygen concentrations are between 7 and 8 mg/L.

Table 2-1. Summary of Environmental Factors During and Prior to Plankton Sampling

Environmental Factor	February			May			August			November		
	Low	Middle	High	Low	Middle	High	Low	Middle	High	Low	Middle	High
Flow, 1,000 cfs	<20	20–30	>30	<20	20–30	>30	<30	30–35	>35	<20	20–25	>25
Year	–	*	(74,75,83)	76,82,	*	(83,84)	76,77,85	*	–	(83,85)	*	(76,82)
Turbidity, NTU	<	10–20	>20	<10	10–20	>20	<10	10–20	>20	<10	10–20	>20
Year	(83,84)	*	74,75, 76,77	(82,85)	*	(74,75)	82,83, 84,85	*	(75,76,77)	82,83, 84,85	*	(75,76,77)
Wind Speed, mph	<5	5–10	>10	<5	5–10	>10	<5	5–10	>10	<5	5–10	>10
Year	(83)	*	(73)	(75)	*	(74)	(84)	*	–	(77,82)	*	(74)
Temperature, C	<5	5–8	>8	<17	17–20	>20	<25	25–26	>26	<15	15–16	>16
Year	(77,85)	*	(74,75)	(77)	*	(75)	(76)	*	(77)	(76)	*	(75,85)
DO, mg/L	<11	11–12	>12	<7	7–9	>9	<4	4–5	>5	<7	7–8.5	>8.5
Year	(84)	*	(75,77)	(75)	*	(82,83,84)	(77,85)	*	(76,82)	(77)	*	(76,83)
pH	<7	7–7.5	>7.5	<7	7–7.5	>7.5	<7	7–7.5	>7.5	<7	7–7.5	>7.5
Year	–	*	77,83,85	–	*	73,74, 82,85	–	*	(85)	–	*	(84)
Alkalinity, mg/L	<50	50–60	>60	<50	50–60	>60	<50	50–60	>60	<50	50–60	>60
Year	(84)	*	(77,83)	(76,83)	*	(82)	(76)	*	(82–85)	(75,77)	*	(84,83,84)
Inorganic N, mg/L	<.4	.4–.5	>.5	<.3	.3–.4	>.4	<.3	.3–.35	>.35	<.3	.3–.5	>.5
Year	–	*	(75,76)	–	*	(77,84)	(85)	*	(73,74,76)	(83,84)	*	(77)
Organic N, mg/L	<.1	.1–.2	>.2	<.1	.1–.2	>.2	<.1	.1–.2	>.2	<.1	.1–.3	>.3
Year	–	*	(83,85)	(77,84)	*	(82,85)	–	*	73,82,85	(76,77)	*	(73,74)
Diss. P, mg/L	<.01	.01–.02	>.02	<.01	.01–.02	>.02	<.01	.01–.02	>.02	<.01	.01–.02	>.02
Year	–	*	(83)	–	*	–	(82,84)	*	(76)	(82,84)	*	(83)

Table 2-1 (Continued)

Environmental Factor	February Low	February Middle	February High	May Low	May Middle	May High	August Low	August Middle	August High	November Low	November Middle	November High
Total P, mg/L	<.03	.03–.04	>.04	<.02	.02–.03	>.03	<.02	.02–.03	>.03	<.03	.03–.04	>.04
Year	–	*	(84)	–	*	(76,77)	–	*	(73,76)	–	*	(84)
Diss. C, mg/L	–	1.5–2.0	>2.0	–	1.5–2	>2.0	–	2–4	–	–	2–4	–
Year	–	(84)	–	–	(84)	(85)	–	(84–85)	–	–	(84,85)	–
Total C, mg/L	<2	2–3	>3	<1	1–2.5	>2.5	<	2–3	>3	<2	2–3	>3
Year	(76,85)	*	–	–	*	–	(74,75,77)	*	(82,83,85)	(76,84)	*	–
Chlorophyll *a*, ug/L	–	4–5	6–12	1.5–3.5	1.5–5.5	>5.5	2–3	2–5	>5	1–2	3–4	5–6
Year	–	(83,85)	(84)	(82)	(84)	(83,85)	(83)	(84)	(82,85)	(84)	(83)	(82,85)

*All years except those in low and high categories.

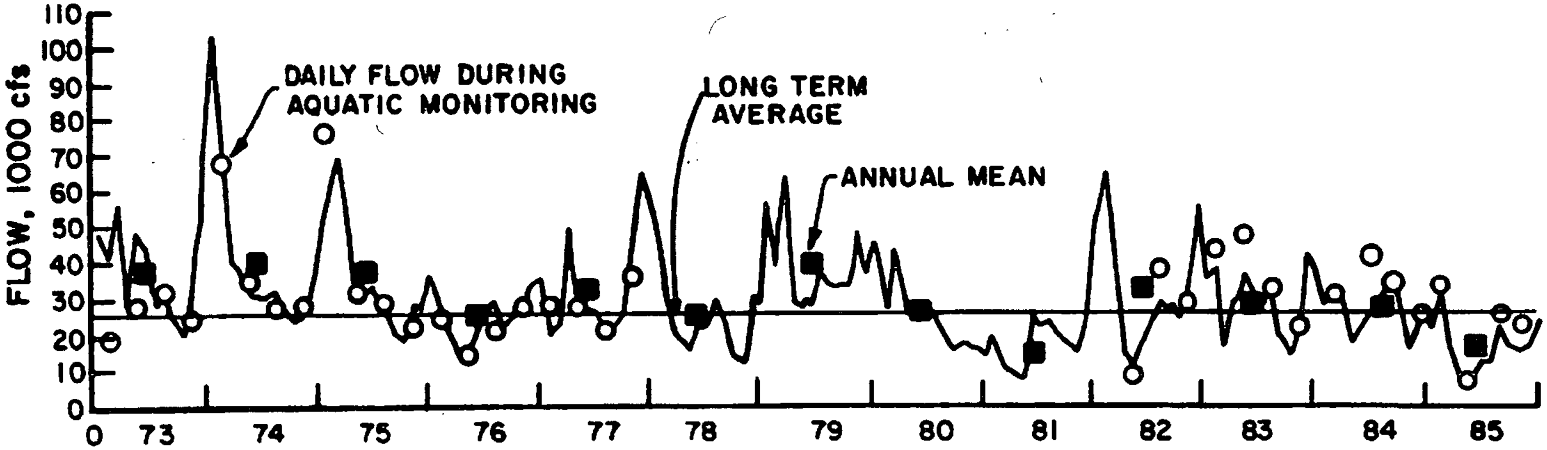


Figure 2-1. Monthly Flows From Watts Bar Dam During Preoperational WBN Aquatic Monitoring.

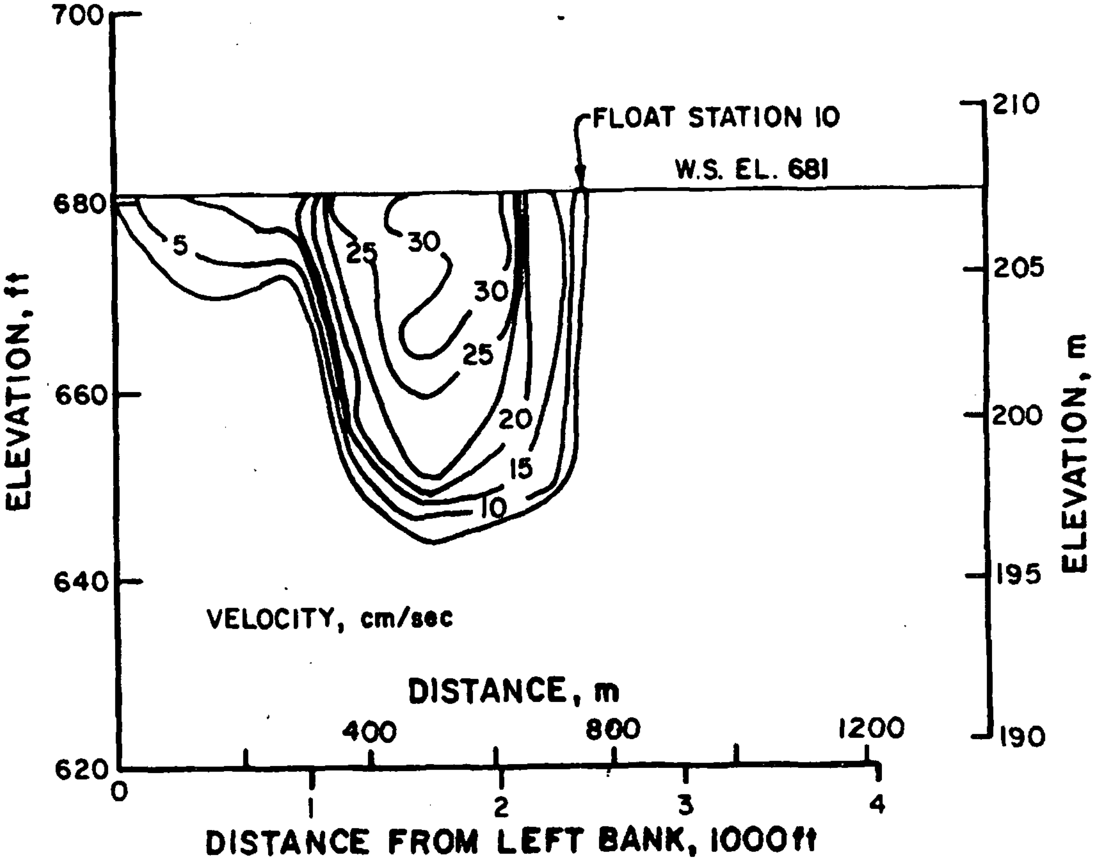


Figure 2-2. Velocity Distribution at TRM 497 During Flow of 1133 m^3/s (40,000 cfs) with a Mean Velocity of 22 cm/s.

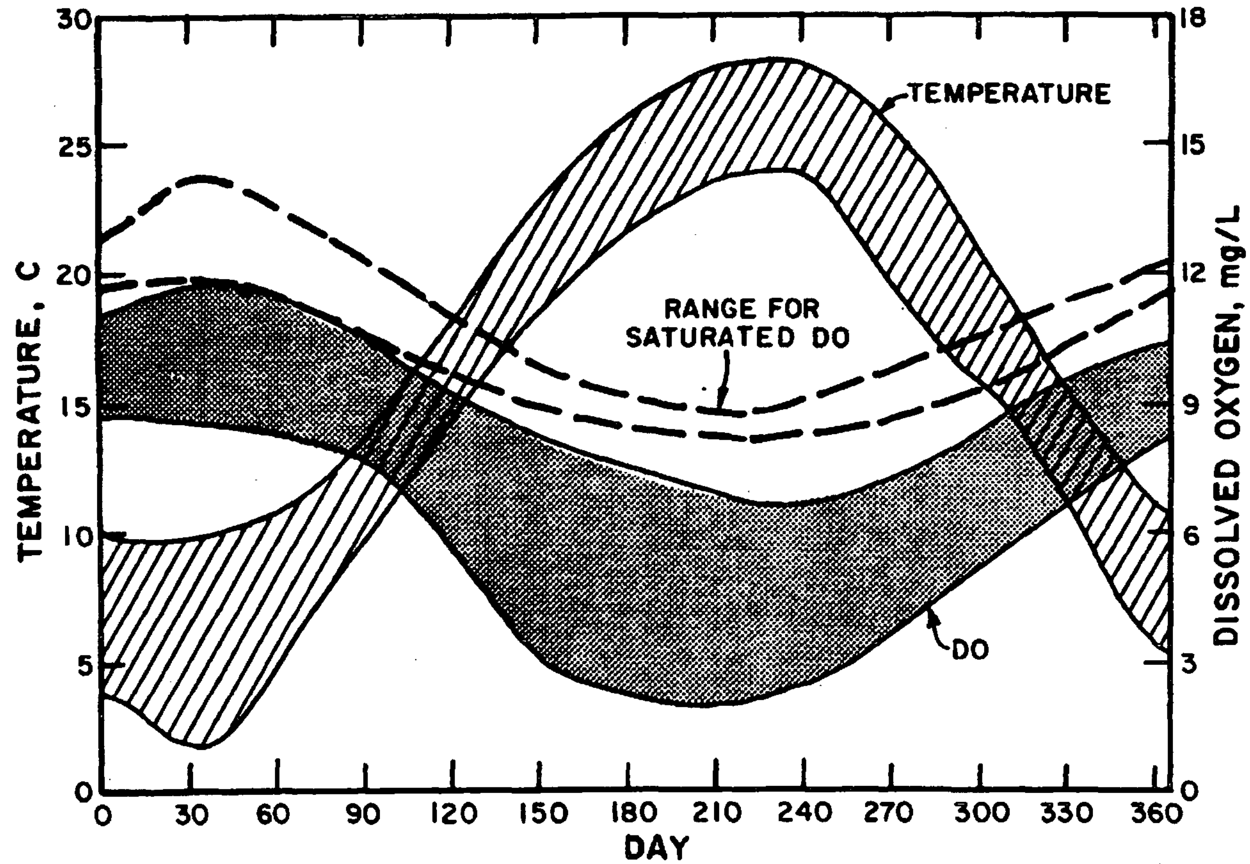


Figure 2-3. Seasonal Temperature and Dissolved Oxygen Concentration Range for Watts Bar Dam Releases, 1970-85.

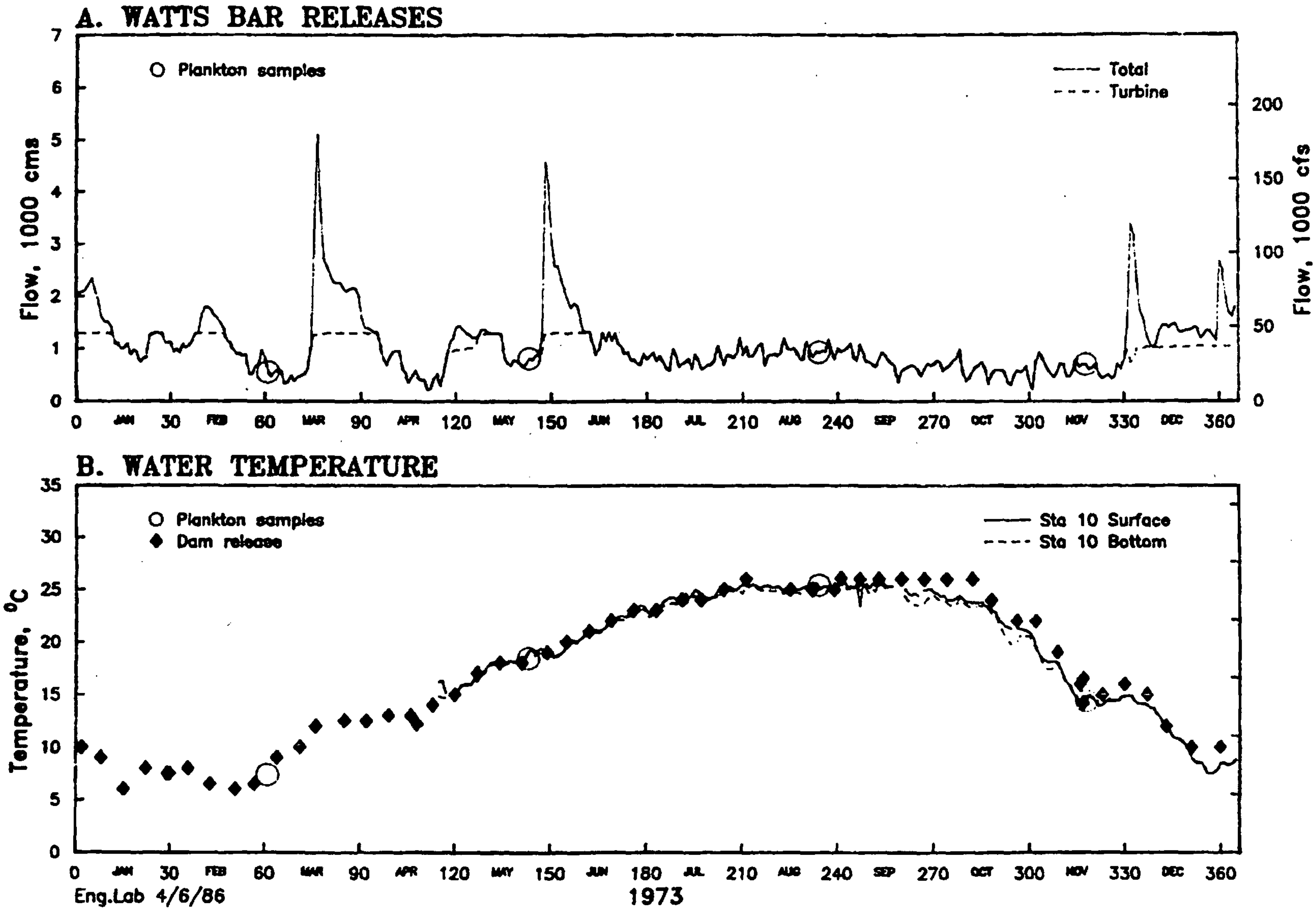


Figure 2.4. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1973.

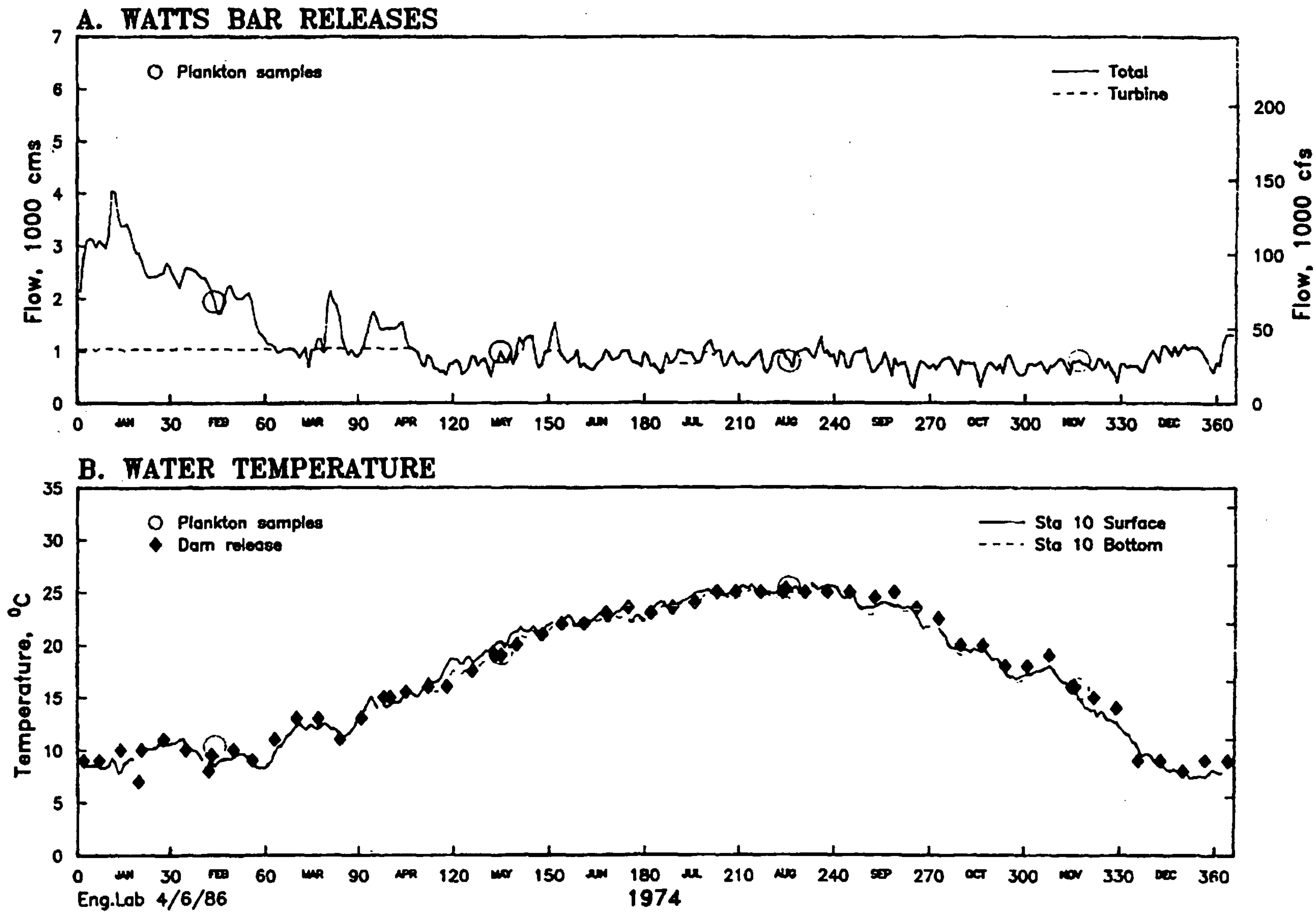


Figure 2.5. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1974.

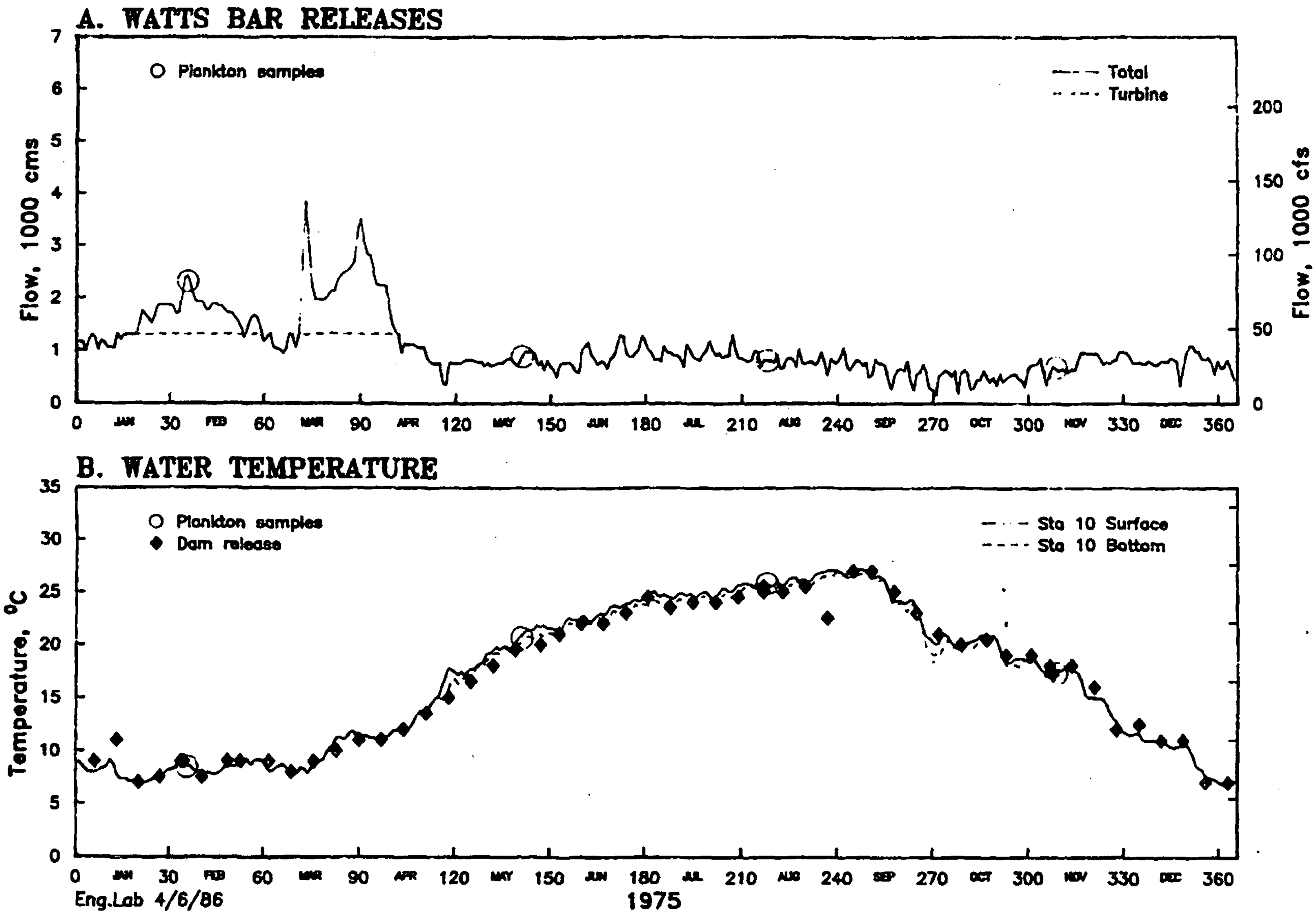


Figure 2.6. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1975.

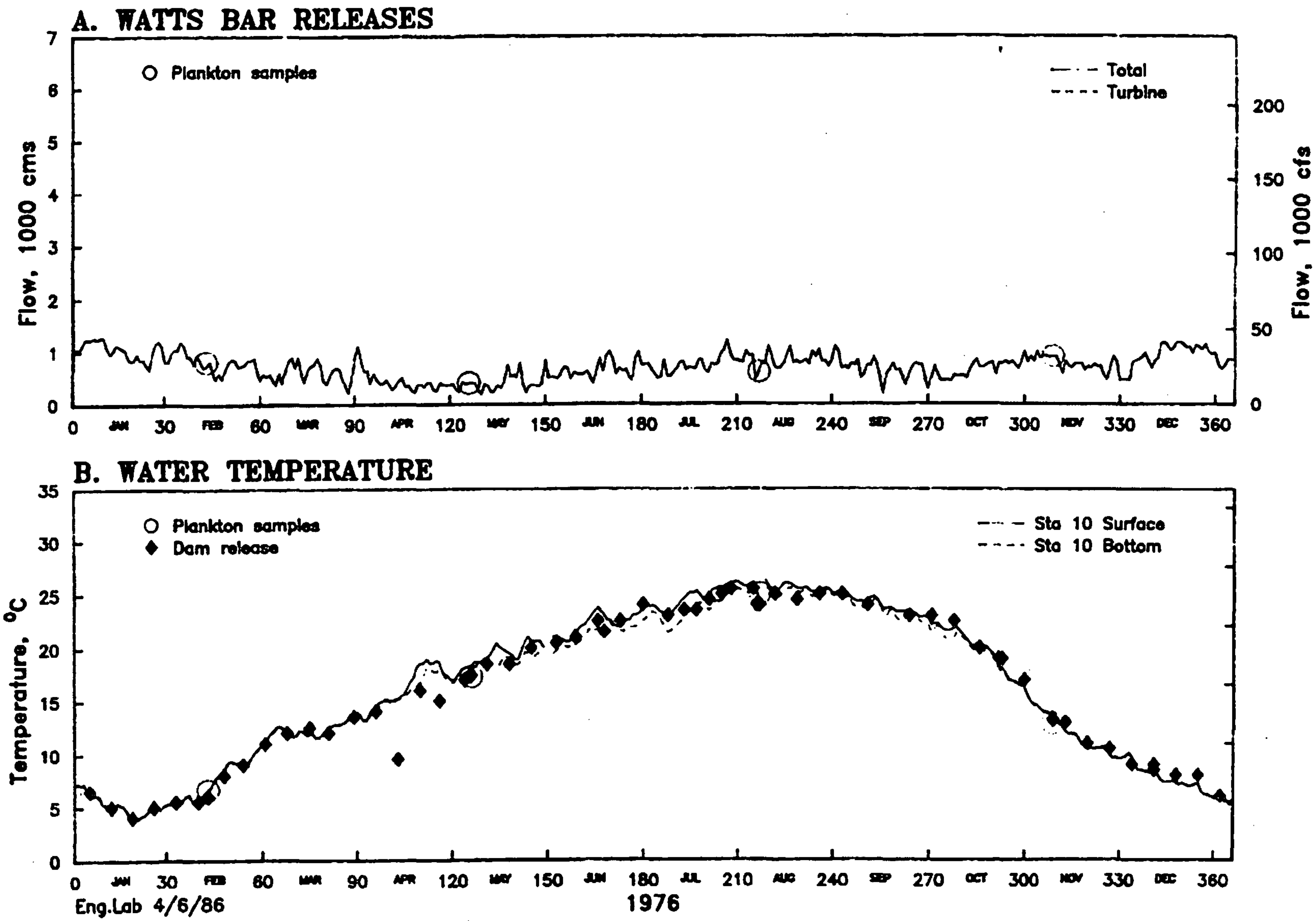


Figure 2.7. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1976.

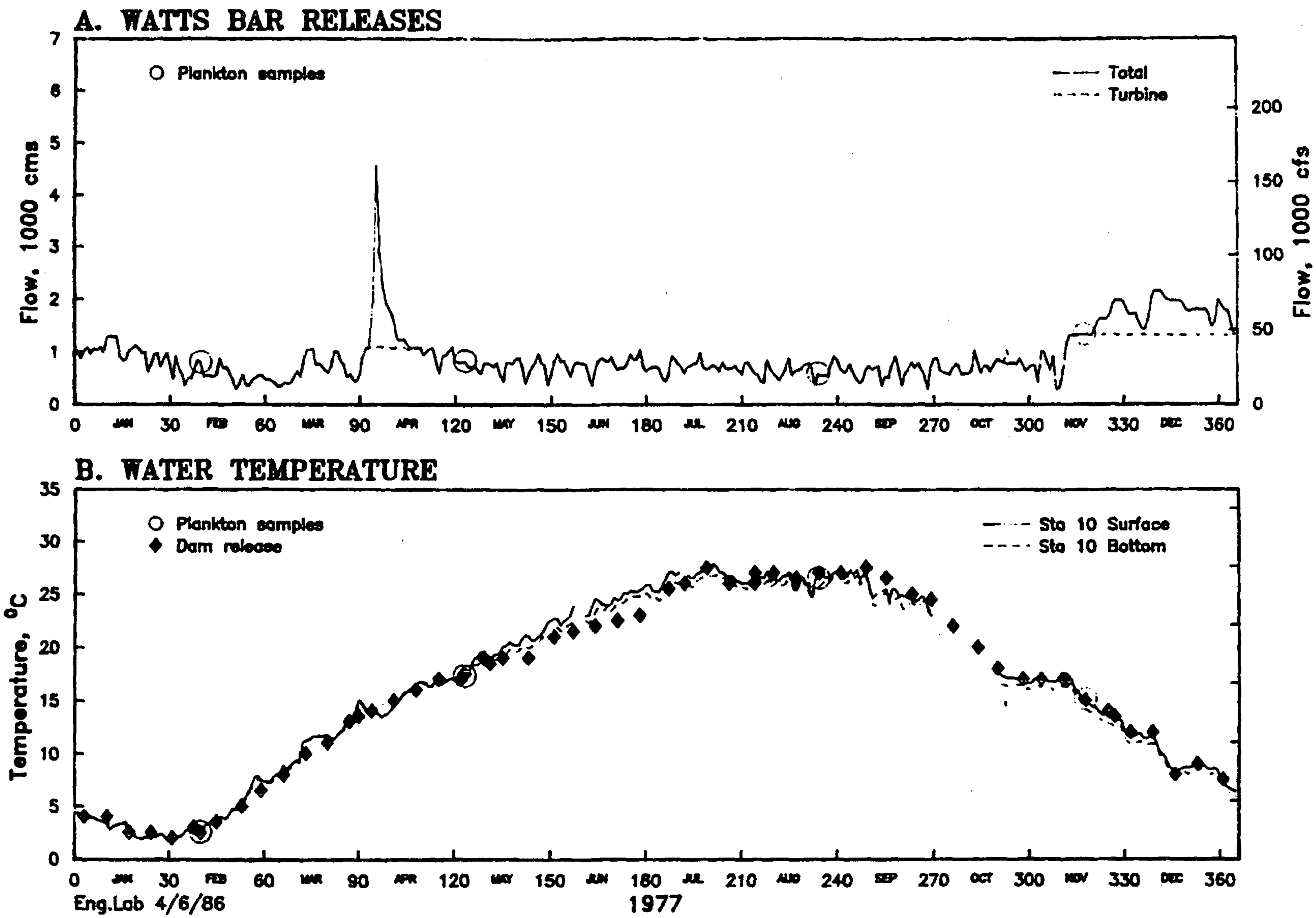


Figure 2.8. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1977.

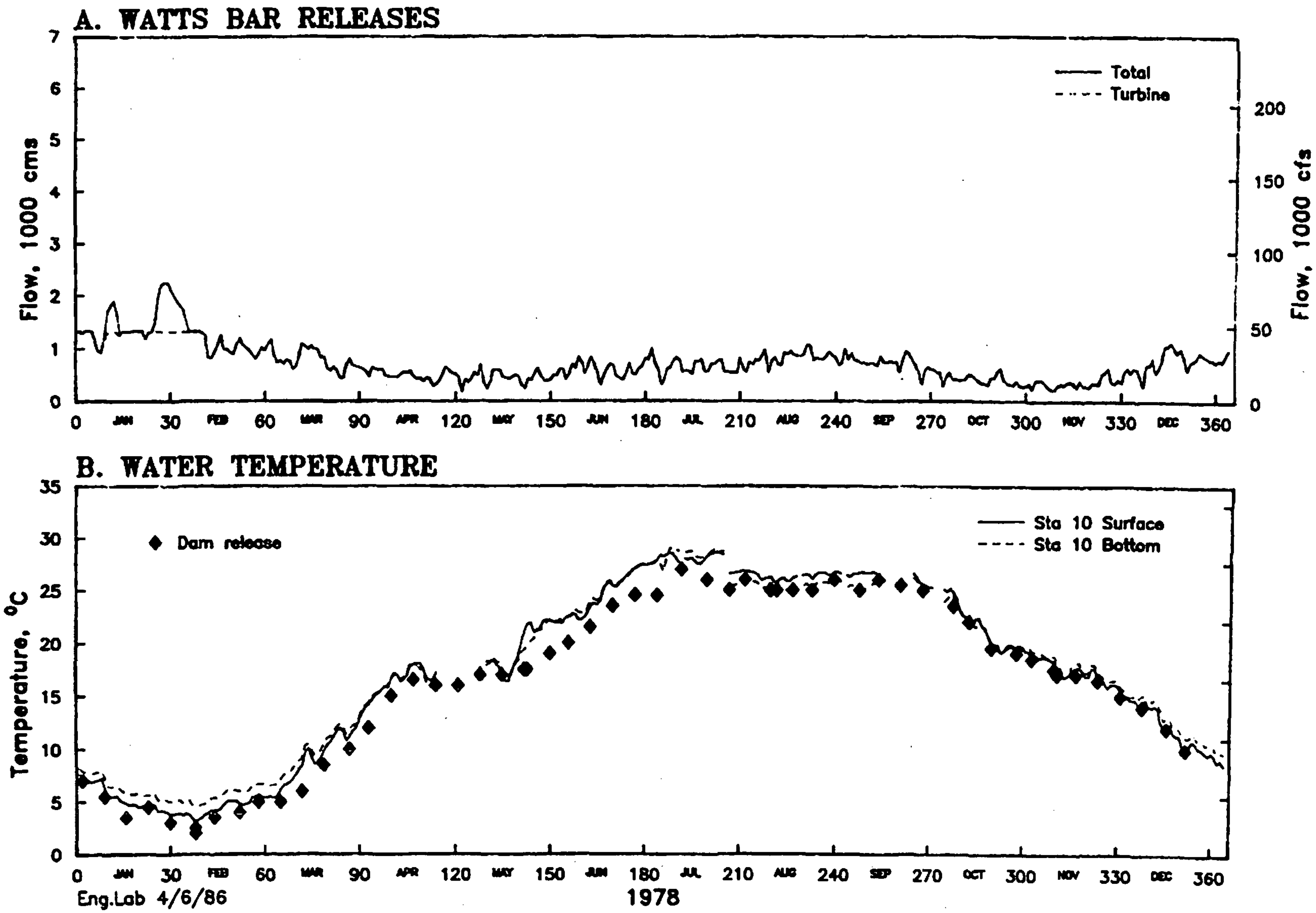


Figure 2.9. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1978.

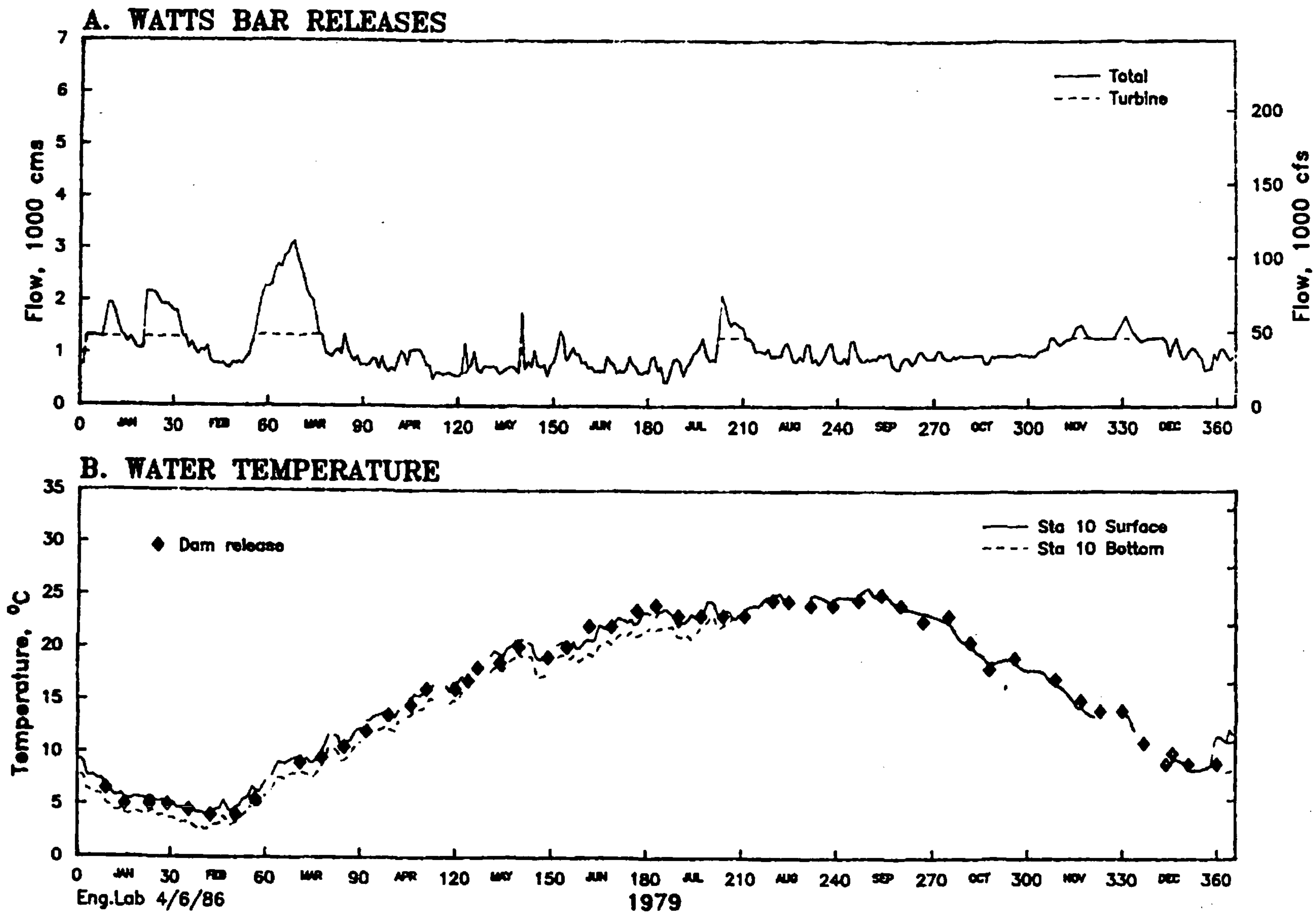


Figure 2.10. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1979.

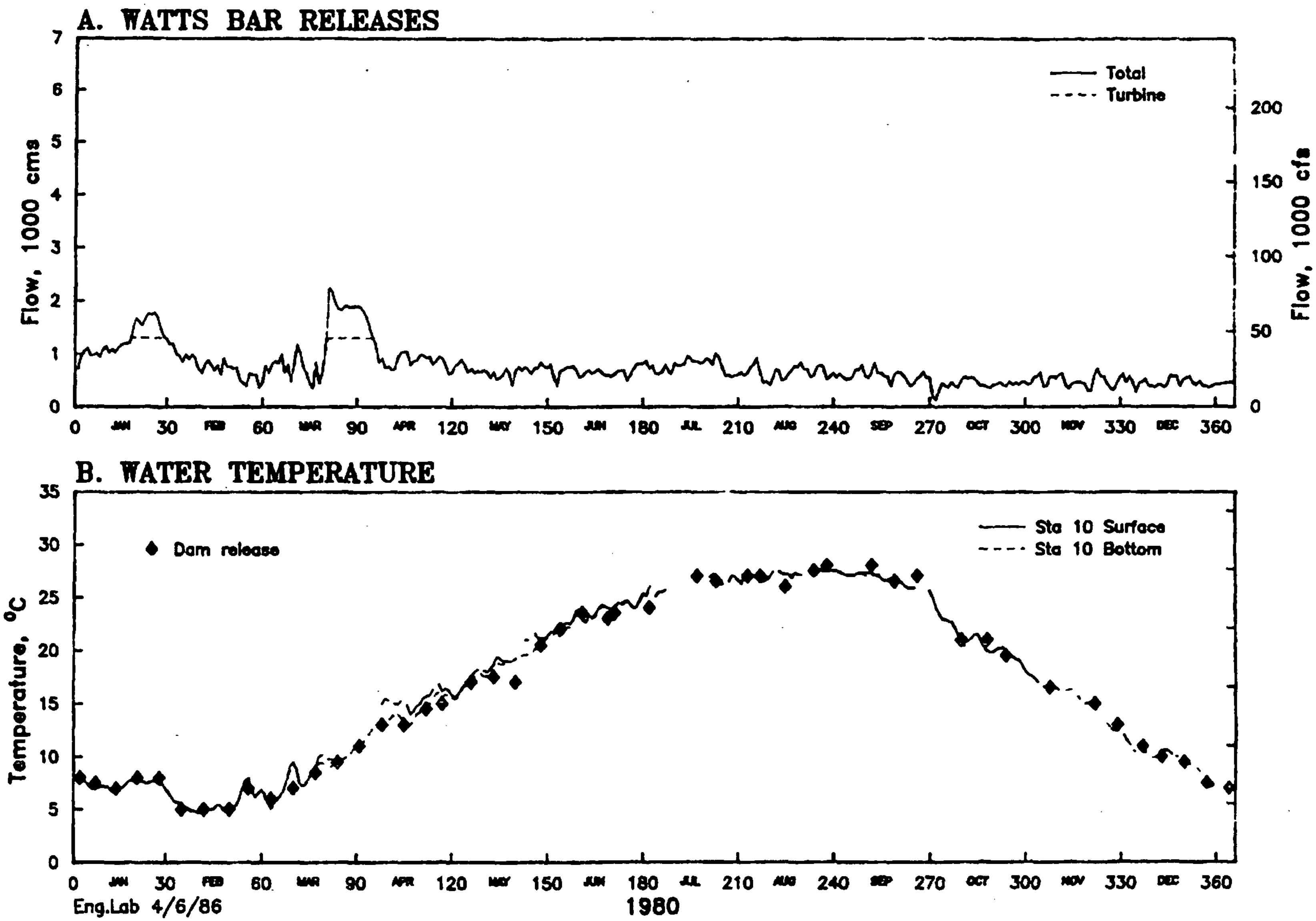


Figure 2.11. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1980.

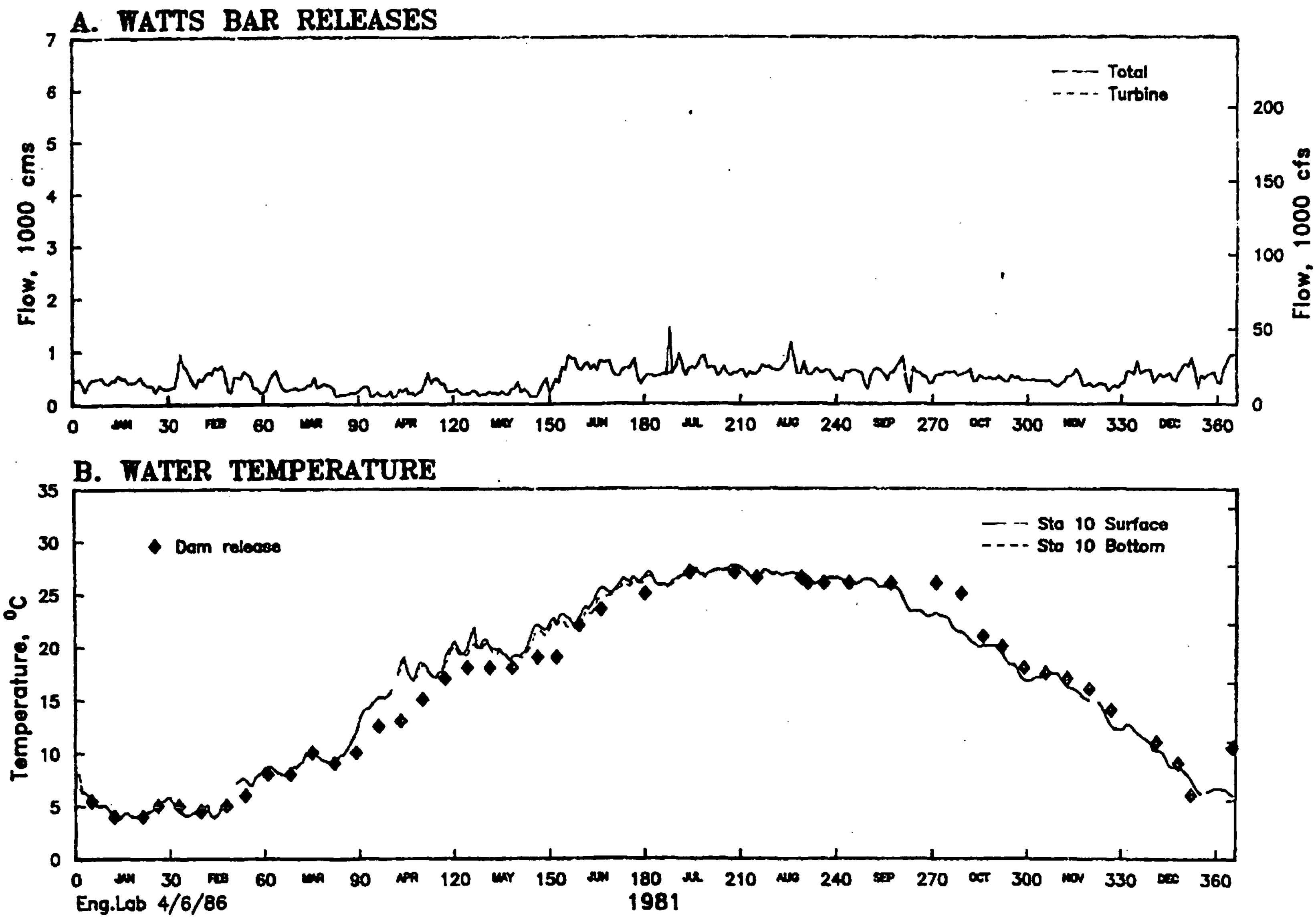


Figure 2.12. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1981.

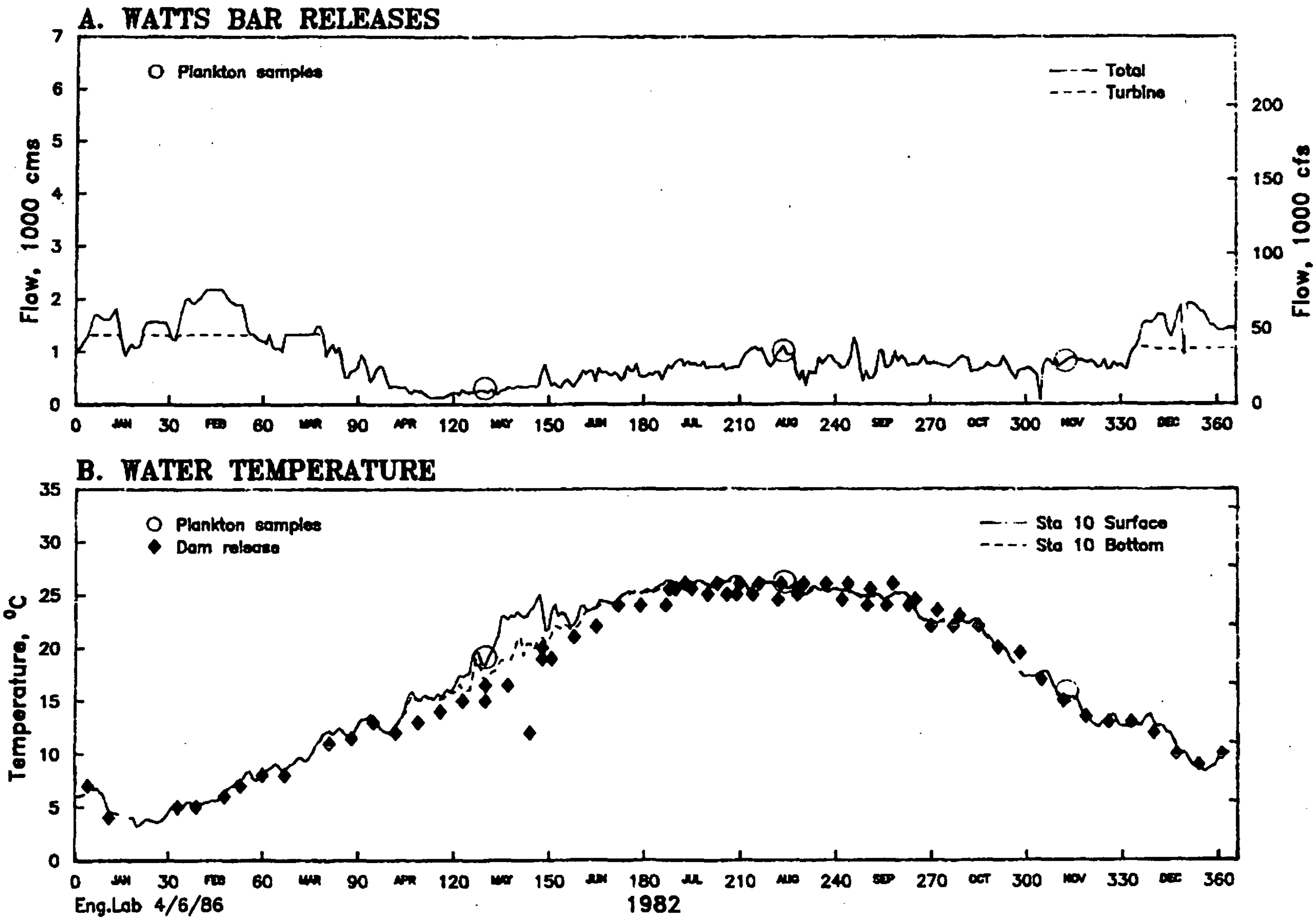


Figure 2.13. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1982.

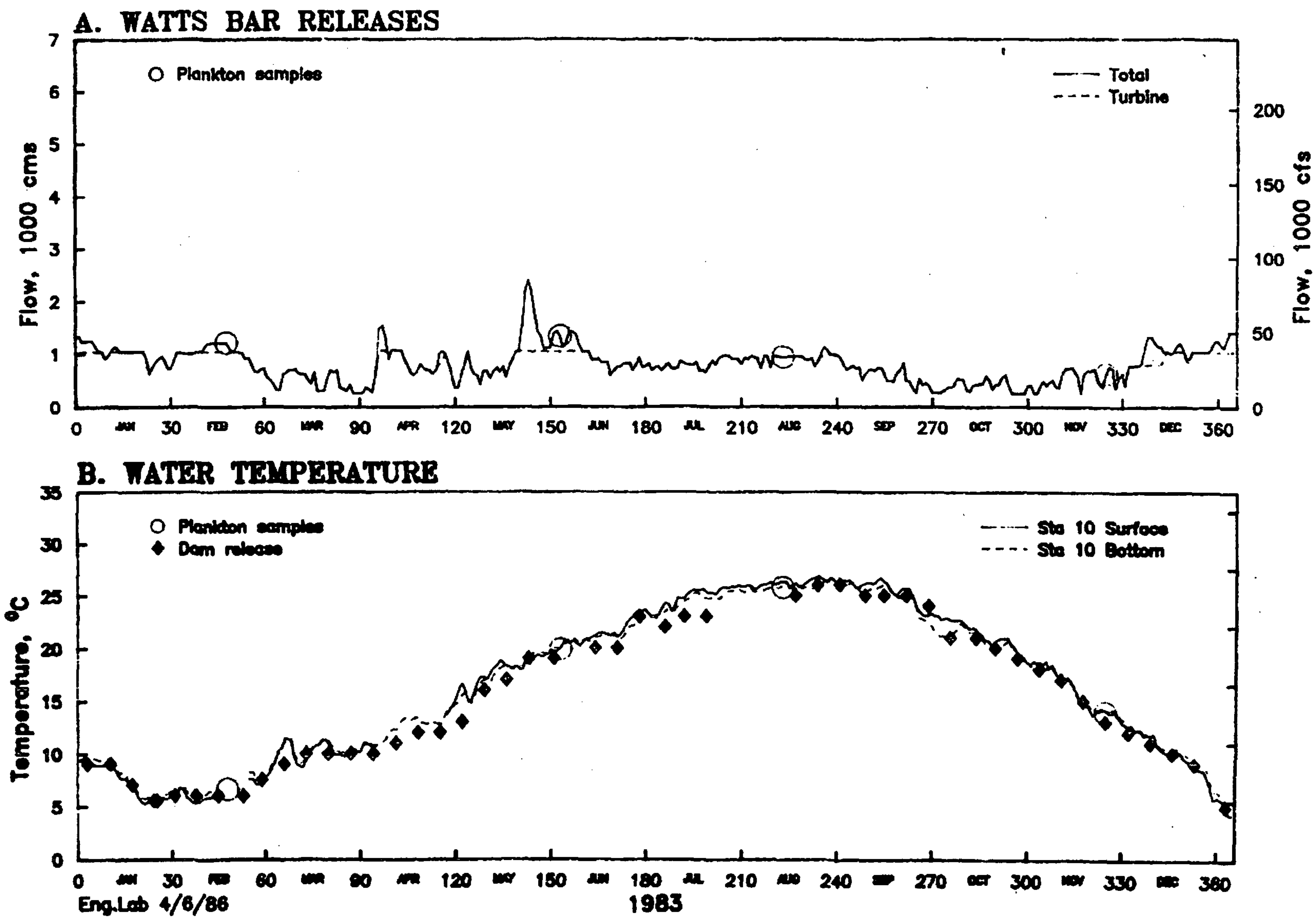


Figure 2.14. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1983.

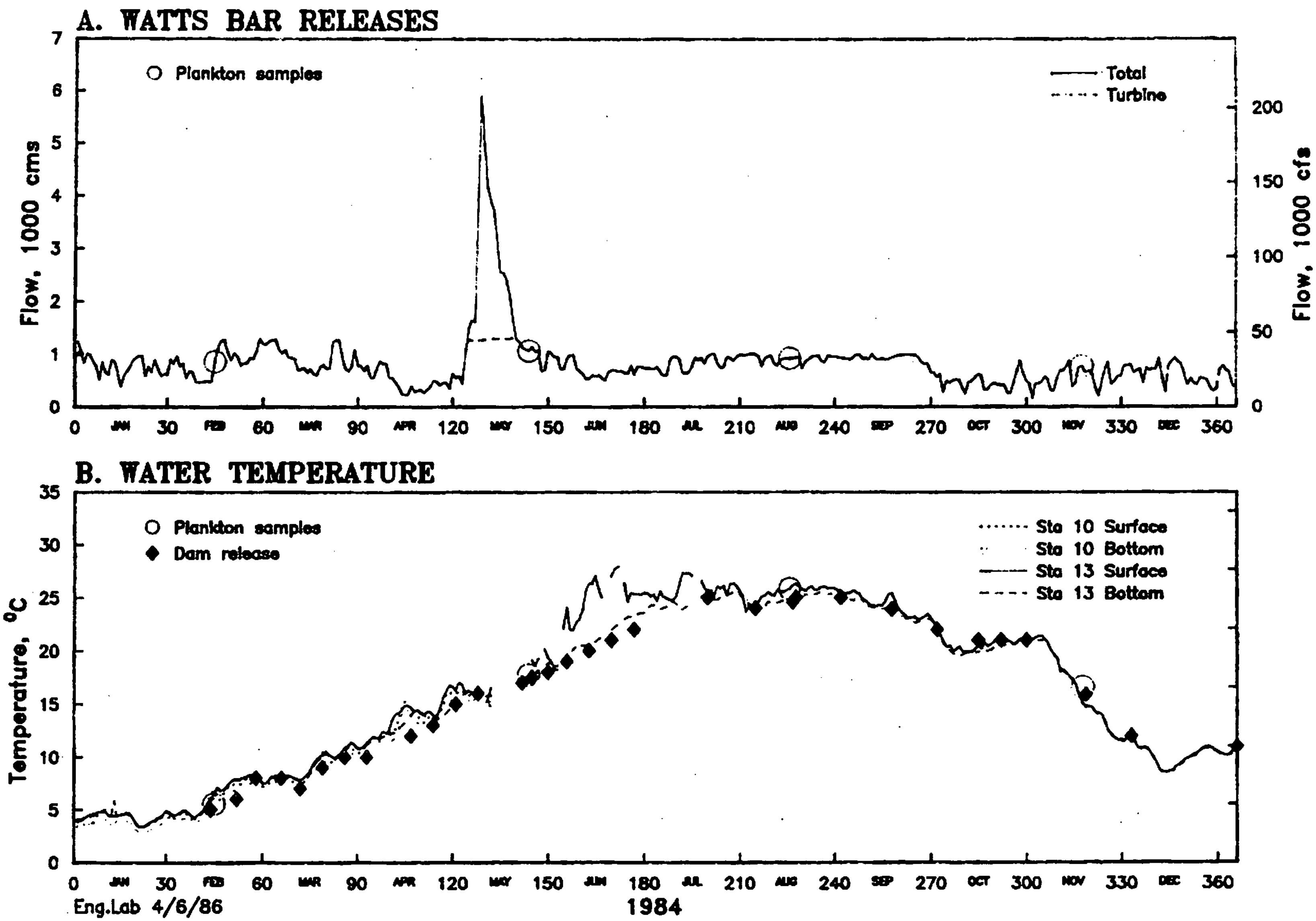


Figure 2.15. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1984.

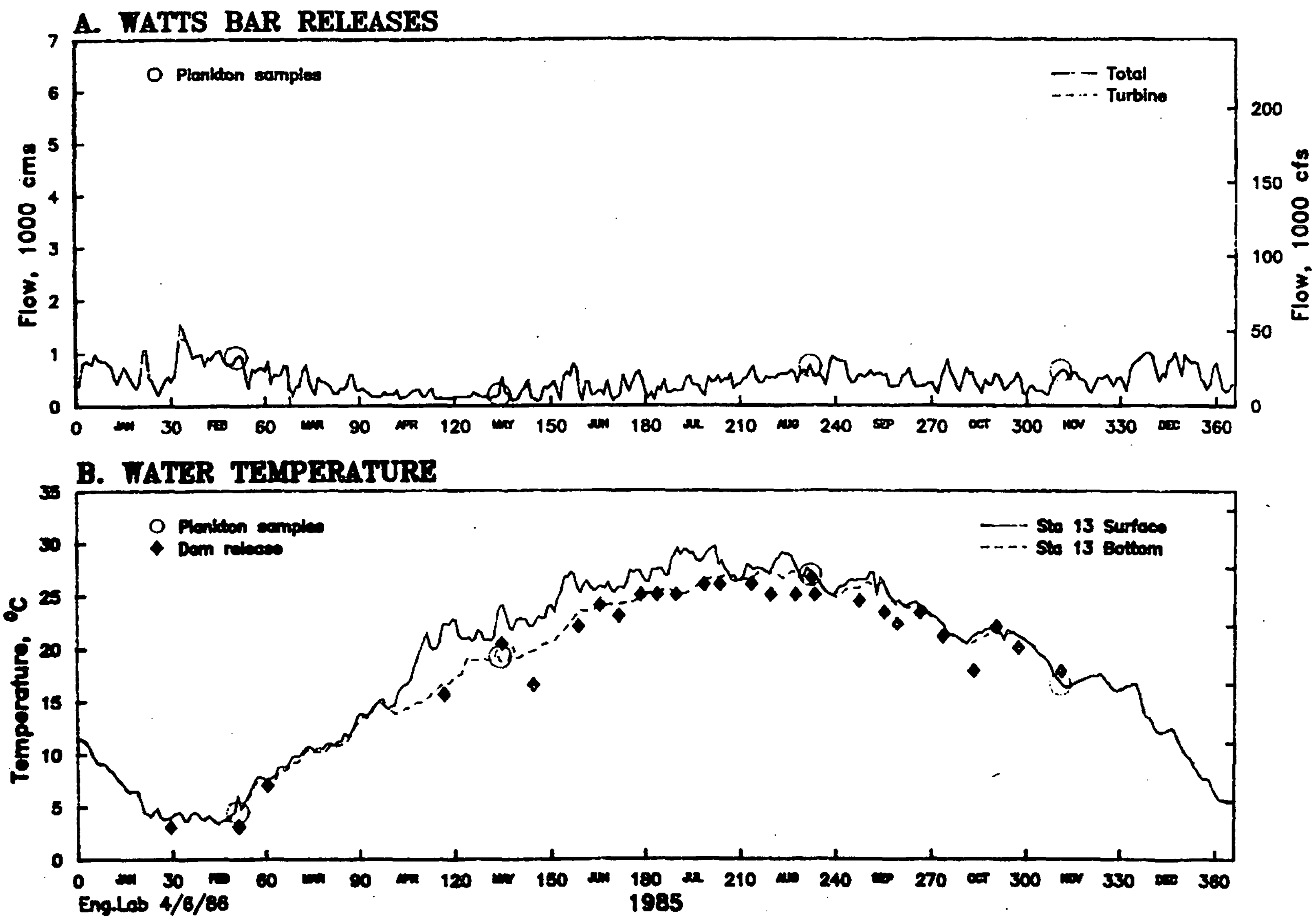


Figure 2.16. Daily Flow and Temperature Patterns for the WBN Aquatic Monitoring Reach, 1985.

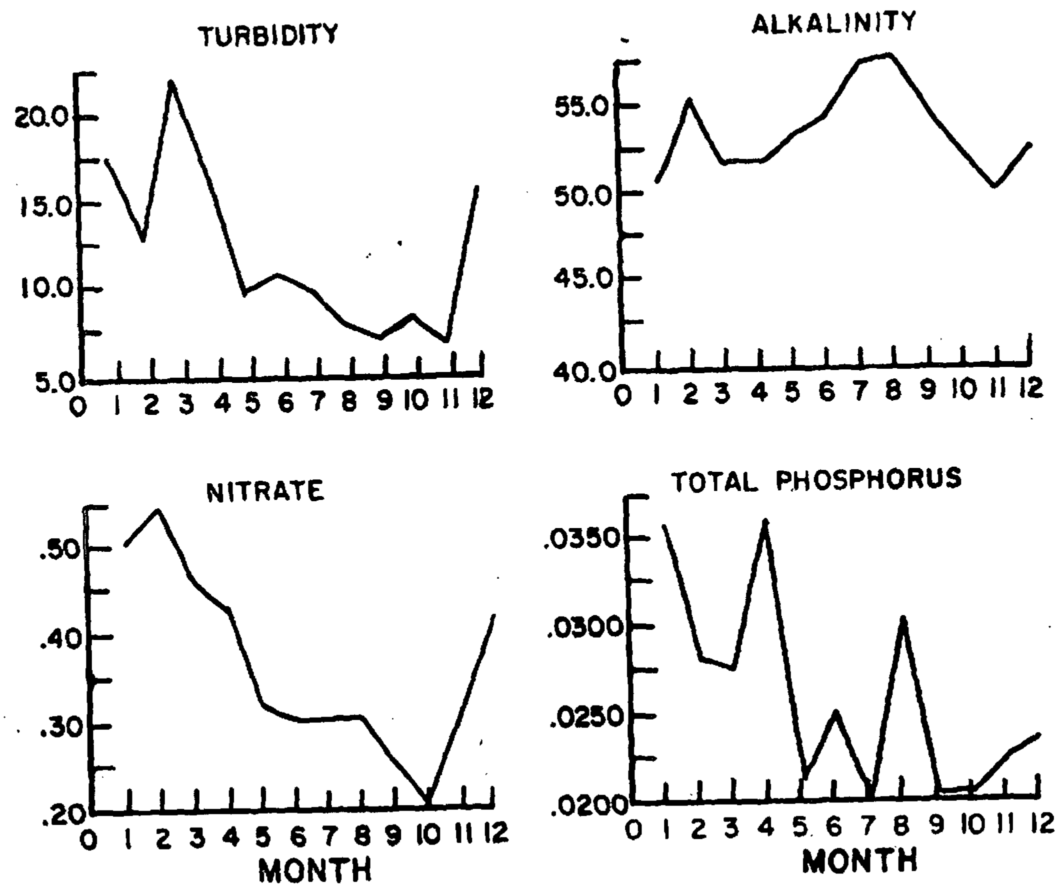


Figure 2-17. Seasonal Water Quality Patterns for Watts Bar Dam Releases.

3.0 OTHER FACTORS POTENTIALLY AFFECTING WATER QUALITY AND BIOLOGICAL CONDITIONS

3.1 Instream Construction

Large-scale monitoring of construction effects was not necessary at WBN, but special monitoring was conducted during dredging operations for the discharge diffuser and removal of the "intake plug." Generally these activities resulted only in short-term, localized perturbations to water quality near the plant. A summary of the monitoring carried out in conjunction with each of these activities follows.

Diffuser Dredging--About 1,200 m^3 of material was removed to install the diffuser line. Originally the expected time required for removal of this small volume of material was three days. Although a much longer period (March 1977-July 1977) was required, the quantity of material removed was the same as the original estimate. The period of diffuser dredging was extended because of a limestone lens in the dredging area and periods of heavy rainfall that raised pool levels.

The presence of the rock, although extending the dredging time, probably resulted in less impact to the aquatic environment. The fractured limestone rock (removed by line drill and shovel) contained smaller quantities of fine particles which could be resuspended in the water column and carried out of the dredge zone. Turbidity was observed <75 m downstream from the dredging operation.

Intake Plug Removal--Removal of the intake plug began August 25, 1977. Riverside dredging resulted in a visible turbidity plume which extended downstream along the right bank for several hundred meters. A water quality survey was conducted at the peak of dredging activities on October 18, 1977. The survey confirmed that the plume was confined to a narrow portion of the river. Maximum suspended solids concentration and turbidity in this zone did not exceed 29 mg/L and 16 JTU respectively (table 3-1). As expected, these values were higher than those upstream from the dredging operation, but concentrations rapidly receded downstream. Within about 700 m, suspended solids and turbidity levels approached the upstream control levels.

3.2 Facility Discharges

In addition to discharges resulting from assorted water uses at WBN, the principal point-source discharge in this vicinity during the preoperational period was from the Watts Bar Fossil Plant (WBF). As noted in section 2.0, WBF was in operation during the first phase of preoperational monitoirng 1973 to 1979, but operation ceased prior to the second phase, 1982 to 1985. Both WBN and WBF discharges were regulated by NPDES permits. Instream water quality monitoring, conducted as part of the preoperational monitoring program (see section 4.0), provided an additional check of stream conditions relative to these discharges.

3.3 Aquatic Macrophytes

One of the most obvious changes in reservoir condition since the initiation of WBN preoperational monitoring has been the dramatic increase of submersed aquatic macrophytes. Similar increases occurred in other TVA mainstream reservoirs. Although macrophyte colonization has been limited in the immediate vicinity of WBN, total acreage infested in Chickamauga Reservoir has increased about seven-fold since the mid-1970's. In 1985, 16 percent (5,600 acres) of the total reservoir area was colonized, primarily by exotic species (Eurasian watermilfoil, *Myriophyllum spicatum*; spinyleaf naiad, *Najas minor*; and southern naiad, *Najas quadalupenis*) (Burns et al. 1986). These species have become established in overbank and shallow areas of the reservoir and often create reservoir-use conflicts. Control measures are necessary in areas around recreation and public access sites, lakeshore development, and industrial water intakes. Control activities have entailed an integrated approach using reservoir drawdown and herbicide applications.

Dense aquatic weeds have been implicated in water quality deterioration (temperature and dissolved oxygen) in localized areas, altering fish distribution and standing stocks, and changing flow patterns and silt deposition in reservoirs. Although similar conditions have not occurred in the immediate vicinity of WBN, possible impacts relative to monitoring and evaluation of reservoir-wide conditions are recognized. Various aspects of the impact of aquatic macrophytes have been addressed in the SQN aquatic monitoring program (TVA 1986).

Table 3-1. Water Quality Survey During Dredging from Intake Plug Removal, Watts Bar Nuclear Plant, October 1977.

Location: Tennessee River Mile		Location: % From L. Bank	Depth Meters	Suspended Solids mg/L	Turbidity JTU
528.2	Control Station	95	0.3	7	7.0
			1.5	13	7.3
		50	0.3	9	7.4
			1.5	8	7.8
			5.0	9	6.5
527.95	Dredging Zone	95	0.3	29	16
			1.5	28	16
		80	0.3	7	7.2
			1.5	8	7.2
			5.0	8	7.3
527.8	240 meters below dredging zone	95	0.3	18	9.0
			1.5	25	15
		80	0.3	-	7.1
			1.5	-	7.3
			5.0	-	4.7
527.63	515 meters below dredging zone	95	0.3	17	10
			1.5	21	12
		50	0.3	-	6.4
			1.5	-	5.8
			5.0	-	7.2
527.5	725 meters below dredging zone	95	0.3	15	9.0
			1.5	18	10
		70	0.3	-	6.1
			1.5	-	6.7
			5.0	-	6.8
527.12	1,335 meters below dredging zone	95	0.3	11	8.0
			1.5	13	7.8
		50	0.3	7	6.5
			1.5	9	7.1
			5.0	8	6.0

4.0 INSTREAM WATER QUALITY

The Tennessee River in the vicinity of WBN is presently classified by the State of Tennessee as an "effluent limited" stream, where stream standards are met and there are no significant sources of pollution (Tennessee, 1978). In this classification, stream standards are met through secondary treatment for municipalities and best practicable treatment for industries. The Tennessee River from mile 496.5 (2.9 miles downstream from the mouth of the Hiwassee River in Chickamauga Reservoir) to mile 532.1 (near the Piney River embayment in Watts Bar Reservoir) has been classified as suitable for all water uses--domestic, industrial, fish and aquatic life, recreation, irrigation, livestock watering, wildlife, and navigation (Tennessee, 1983). Water quality criteria and standards for the protection of aquatic life and human health are presented in table 4-1.

The following section summarizes results of the quarterly preoperational instream water quality monitoring program conducted near WBN from August 1973 to November 1977 and May 1982 to February 1986. Data collected during the 1973-77 period have been summarized previously (TVA, 1980b) but are again included as part of this report.

4.1 Materials and Methods

Field--The WBN quarterly preoperational water quality monitoring program is summarized in table 4-2. Horizontal locations at each river mile were selected to coincide with the primary river channel. Where two horizontal locations are given for a particular river mile, both locations (except for TRM 532.1) are within the main Tennessee River channel. (At TRM 532.1, the two horizontal locations are over original river channels that once were separated by an island. The island is now underwater.) Water quality data were collected quarterly during the August 1973 to November 1977 and May 1982 to February 1986 sampling surveys. Surveys were scheduled as much as possible so that winter collections were made in February, spring collections in May, summer collections in August, and autumn collections in November.

Prior to 1976, *in situ* full stratum measurements of only temperature and dissolved oxygen (DO) were made at all stations. Full stratum measurements of pH and conductivity in addition to temperature and DO have been made regularly since February 1976.

Since 1976, water quality data (nutrients) were obtained to support assessment of biological data at 7 of the 12 water quality monitoring stations (see figure 5-1). Prior to 1976, only TRM 527.4 was sampled for a comprehensive set of parameters including nutrients. During 1976-77, biological support water quality samples were collected at depths of 1.0, 3.0, and 5.0 m and during 1982-86 at depths of 0.3, 1.0, 3.0, and 5.0 m. These samples were poured from the same subsurface water sample as the replicate phytoplankton samples.

Since August 1973, a more complete set of chemical parameters were determined at TRM 527.4; and starting in February 1984, some of these extra chemical parameters were collected at TRMs 529.5, 528.0, and 518.0.

During the period from August 1973 to February 1986, the stations sampled and parameters measured have changed somewhat. Table 4-2 shows a summary of data collected. Appendix 4-A lists all measured water quality data and provides the most comprehensive list of stations sampled and parameters measured.

Laboratory--Analytical and sample preservation methods currently used for chemical water quality characterizations are shown in appendix 4-B. The referenced laboratory methods are the preferred TVA methods, which are approved by EPA. The Laboratory Branch may occasionally use other EPA-approved laboratory methods. It should be noted that since the initiation of sampling, analytical and preservation techniques have improved and that samples collected earlier in the sampling period may not have been preserved or analyzed by the method listed in appendix 4-B. The methods used, however, were methods approved by EPA at the time of sampling.

Water quality measurements determined in the field were temperature, DO, pH, conductivity, and alkalinity. "Biological support" water quality samples were analyzed for organic nitrogen, ammonia, nitrogen, nitrate plus nitrite nitrogen, total and dissolved phosphorus, and total and dissolved organic carbon. Other chemical and physical measurements included turbidity, 5-day biochemical oxygen demand (BOD), chemical oxygen demand (COD), total nonfiltrable residue (total solids), dissolved residue (total dissolved solids), calcium, magnesium, sodium, potassium, chloride, sulfate, dissolved silica, aluminum, arsenic, barium, beryllium, boron, cadmium, chromium, copper, total and dissolved ferrous iron, lead, lithium, total and dissolved manganese, mercury, nickel, selenium, silver, titanium, and zinc.

Data Analysis--All water quality data were entered into the EPA water quality data STOrage RETrieval (STORET) system and are available from TVA's Data Services Branch. All data reduction and statistical evaluation procedures used standard statistical routines available through the STORET system. Many data inferences and interpretations came from an investigation of simple plots of data over depth or time. Determinations of statistical differences among stations and different sampling periods were made using Duncan's Multiple Range Test in conjunction with an analysis of variance.

4.2 Results and Discussion

The quarterly preoperational data collected from August 1973 to February 1986 are summarized in appendix 4-C. Similar statistics for the same period, but based on the season or quarter, are presented in appendix 4-D. Statistics in appendices 4-C and 4-D combine depth, and thus vertical differences in parameters that may exhibit stratification are not apparent. Therefore, care must be exercised in comparing within and between tables. The raw data used to determine the above described statistics are tabulated in appendix 4-A.

The major factor influencing the water quality of the Tennessee River in the vicinity of WBN (TRM 528) is the flow and quality of releases from Watts Bar Dam. These releases generally inhibit stratification and establishment of a strong thermocline so that the water column is usually well mixed in the main channel. This is especially true for the six river mile stations sampled below Watts Bar Dam (TRMs 529.5 to 496.5). The two stations at TRM 532.1 (above Watts

Bar Dam) both show fairly strong stratification during some months of the year. This stratification is not, however, as strong as that observed in some of TVA's tributary storage reservoirs.

Dissolved Oxygen--While water quality in the vicinity of WBN largely reflects that released from Watts Bar Dam, these releases also obviously reflect the quality of water which flows into Watts Bar Reservoir from upstream dam releases and from the drainage area around Watts Bar, together with the effect of waste discharges, natural reaeration and other factors. With respect to DO, this parameter is affected by the upstream tributary reservoir releases from Cherokee and Douglas. These reservoirs stratify during the summer months (i.e., May through September) and release low DO water which, although reaerated as it travels down to Watts Bar Dam, still has some effect on DO concentrations in the Watts Bar Dam tailwaters. DO concentrations in the Watts Bar Dam tailwaters have been measured on a weekly basis (roughly) since 1960. Therefore, while these data were not specifically part of the WBN preoperational monitoring program, an evaluation of the data collected at the dam from 1973 through 1985 was conducted. These data, having been collected weekly rather than quarterly as were the preoperational data, provide a much more accurate picture of DO concentrations in the vicinity of WBN, especially because the dam is only 2.0 miles upstream from the WBN diffuser (TRM 528).

Table 4-3 summarizes the occurrence of low DO levels (e.g., below the State standard of 5.0 mg/L) at Watts Bar Dam. As shown therein, DO measurements of less than 5.0 mg/L have occurred quite frequently over the past thirteen years as, on the average, the DO was less than 5.0 in about 37 percent of the measurements made during May through September of 1973-85. Furthermore, DO levels in the Watts Bar tailrace do not appear to be improving in the 1980s because the average percent of DO values less than 5.0 during May through September was about 51 percent during 1980-85, with 1985 being the worst year of all at 81 percent. The year 1985 reflects the effect of the extreme drought which began in June of 1984 and continues in 1986. The lack of rainfall resulted in lower than normal flows during 1985 and the resultant longer detention times caused the water impounded in the reservoir to become more oxygen-deficient than usual.

In summary, DO concentrations below 5.0 mg/L are fairly common during the summer months in the Watts Bar Dam tailrace, and are more frequent during low flow years such as 1985. Discussion of the data collected specifically for the WBN preoperational monitoring program is presented below.

February--February DO profiles showed little or no surface to bottom variation with all stations indicating well mixed conditions. With the exception of two of the river mile stations sampled during 1974, all DO measurements made on the Tennessee River during the preoperational period fall between 9.0 and 14.0 mg/L. The atypical DO observed on February 12, 1974 occurred at TRM 532.1 (37 and 85 percent horizontal locations) and at TRM 496.5 (57 percent horizontal location). DO values over these three profiles ranged from 2.8 to 10.0 mg/L. The reason for these low DO values is unknown as DO concentrations on this day in the dam tailrace and other locations sampled were in the range of 10.0 to 11.0 mg/L. The mean DO concentration at all stations over all years was 11.6 mg/L (306 observations).

May--May DO profiles at the Chickamauga Reservoir stations showed surface to bottom variations from year to year and over the stations downstream from Watts Bar Dam. Most of these DO values fall within the 7.0 to 9.0 mg/L range; however, occasional values less than the 5.0 mg/L standard were observed. These were generally at depths greater than 5 feet. During 1975, an exception, most profiles showed DO values in the 6.0 to 7.8 mg/L range. DO profiles measured at TRM 532.1 (Watts Bar Reservoir) showed 2.0 to 5.0 mg/L variations from surface to the bottom (about 20-m). Surface DO was usually within the 9.0 to 11.0 mg/L range and bottom DO within the 5.5 to 7.5 range. There was seldom any strong oxycline with DO declining at one rate over the entire depth.

August--August DO profiles at all stations below Watts Bar Dam usually showed less than 1.0 mg/L in top to bottom differences and most DO measurements were found to be between 3.0 and 6.0 mg/L. Consistent with the Watts Bar Dam tailrace DO data discussed above, DO concentrations below 5.0 mg/L were common during the August surveys. An average of 46 percent of the August measurements at the 5-foot depth were less than 5.0 mg/L (see table 4-4). The largest variation in top to bottom DO during this study period was found in August at TRM 532.1 in Watts Bar Reservoir. Typically, surface DO was between 8.0 and 12.0 mg/L and bottom DO between 1.0 and 4.0 mg/L with the oxycline in the 3.0 to 7.0-m zone. An exception was 1977 when surface DO at both TRM 532.1 stations was near 5.0 mg/L; the bottom DO was near 1.0 mg/L, lower than other years' observations. Consequently, DO at the Chickamauga Reservoir stations were also lower in 1977.

November--Similar to February, DO profiles in November showed little surface to bottom differences (usually less than 1.0 mg/L) at any station other than at TRM 532.1. Most DO values were between 7.0 and 10.0 mg/L. During 1977, the lowest November, DO values ranged from 6.0 to 7.0 mg/L.

Alkalinity and pH--The State of Tennessee water quality criteria specify that pH shall be within a range of 6.0 to 9.0 for waters used for domestic raw water supply, industrial water supply, recreation, irrigation, livestock watering, and wildlife (Tennessee, 1982). The criterion used for fish and aquatic life is within a range of 6.5 to 8.5 (Tennessee, 1982). Values for pH outside of the less stringent criteria were observed 14 times out of a total of 1,117 pH observations during the preoperational monitoring period. All 14 criteria exceedances occurred during August 1983 at TRM 532.1. In 12 of the 14 instances, the upper pH limit was exceeded in the top five meters. These high pH values were probably related to phytoplankton production in the surface waters. The remaining two exceedances were questionable measurements of 3.0 and 4.6 near the bottom at this same station.

Total alkalinity measurements (4,805) during the preoperational monitoring period ranged from 26 to 81 mg/L as $CaCO_3$ with a mean of 56.2 mg/L, indicating a moderate buffering capacity.

February--Values of pH observed during February ranged from 6.3 to 8.0. Other than one value of 6.3 observed near the bottom at TRM 496.5 (57 percent horizontal location), all values were within the accepted range (6.5 to 8.5) for fish and aquatic life. Most pH profiles, including those at TRM 532.1, showed less than 0.2 pH unit differences from surface to bottom. Total alkalinity measurements during February surveys ranged from 44 to 64 mg/L as $CaCO_3$ and averaged 54.6 mg/L. The mean alkalinity values for each station (all depths and February's combined) were statistically (0.05 level) indistinguishable from each other with most variation being observed between years.

May--All pH observations, except for some near-surface measurements made in 1982 at TRM 532.1, fell within the 6.5 to 8.5 range. Most pH profiles measured below Watts Bar Dam showed differences from surface to bottom of less than 0.2 pH units. Profiles of pH at TRM 532.1 (Watts Bar Reservoir) showed a consistent surface to bottom variation often more than 1.0 pH unit difference with higher values near the surface (probably associated with phytoplankton productivity). Alkalinity ranged from 26 to 70 mg/L as $CaCO_3$ with a mean of 54.7 mg/L. Surface to bottom variations were relatively small, ranging from 0 to 19 mg/L and averaging 3.4 mg/L. The maximum range occurred at TRM 506.6 in 1977.

August--Except for the aforementioned August 1983 pH profiles measured at TRM 532.1, all values were between 6.2 and 8.5 pH units. Similar to observations in April, profiles downstream from Watts Bar Dam showed little surface to bottom differences with most less than 0.2 pH units. Profiles in Watts Bar Reservoir typically exhibited surface to bottom variations near 1.0 pH unit. Except for 1983, typical profiles had pH values near 8.0 at the surface and 7.0 at 20 m. August alkalinity values ranged from 35 to 81 mg/L as $CaCO_3$ and averaged 58.8 mg/L (90 percent of the observations fell within the range of 47 to 73 mg/L).

November--Values for pH ranged from 6.3 to 9.1 pH units. Excluding these two extreme values, the remaining 299 values ranged from 7.0 to 8.3. Most profiles measured, including those at TRM 532.1 in Watts Bar Reservoir, exhibited surface to bottom variations of 0.2 pH units or less. Profiles of alkalinity at any one river mile within any one year were similar to other profiles. Again, surface to bottom variations were small. Overall, November alkalinities ranged from 39 to 69 mg/L as $CaCO_3$ and averaged 56.8 mg/L.

Turbidity--Seasonal light conditions are governed by ambient solar radiation, water transparency, and vertical mixing. Turbidity was low (less than 10 Jackson turbidity units [JTU]) for all measurements in 1976, but all other years showed one or more winter/spring values greater than 10 JTU and usually above 20 JTU. The maximum turbidity was observed in March of 1973 with a value of 60 JTU.

February--Turbidity in February at the seven Tennessee River stations (except for TRM 529.9) ranged from 4.1 to 20 JTU and averaged 8.3 JTU. This corresponds to a one-percent light penetration depth range of 7.3 to 1.5 m and an average of 3.67 m. The February mean turbidity for any station was not significantly different from any other February station mean.

May--Slightly less than February, May turbidity values ranged from 3.2 to 15 JTU and averaged 7.7 JTU. This corresponds to a one-percent light penetration depth range of 9.4 to 2.0 m and an average of 3.9 m. These values were based primarily on measurements at TRM 529.4.

August--Becoming more transparent, August turbidity ranged from 3.2 to 10 JTU and averaged 7.0 JTU. This corresponds to a one-percent light penetration depth of 9.4 to 3.0 m and an average of 4.3 m. Again the majority of measurements were made at TRM 527.4, but the few measurements at TRM 496.5 did not differ significantly. Two observations at TRM 518.0 averaged 10 JTU, which was statistically (significant at 0.05 level) different from the 6.0 JTU mean at TRM 496.5 and the 6.8 JTU mean at TRM 527.4.

November--November observations of turbidity were the lowest of the four seasons, ranging from 2.2 to 10 JTU and averaging 6.2 JTU. This corresponds to a one-percent light penetration depth of 13.6 to 3 m and an average of 4.8 m. All but one of twenty-five turbidity measurements made in November were at TRM 527.4.

Nutrients--Nutrients analyzed during the preoperational period included organic, ammonia, and nitrate plus nitrite forms of nitrogen, total and dissolved phosphorus, and total organic carbon (TOC).

Over all years and all stations the following values were observed.

	Mean	SD	Minimum	Maximum
Org-N, mg/L	0.174	0.126	0.01	1.65
NH_x-N, mg/L	0.055	0.046	0.01	0.43
NO_x-N, mg/L	0.338	0.256	0.01	3.50
Total P, mg/L	0.026	0.010	0.01	0.08
Dissolved P, mg/L	0.013	0.006	0.01	0.07
TOC, mg/L	2.6	1.2	1	15

Comparing these values to the applicable standards listed in table 4-1, all nitrate (NO_3) values were well below the 10 mg/L drinking water standard. Also, all ammonia (NH_3) values were below the aquatic life criterion.

February--Observed means and ranges for the various nutrients were as follows.

	Mean	SD	Minimum	Maximum
Org-N, mg/L	0.158	0.106	0.01	1.53
NH_x-N, mg/L	0.041	0.030	0.01	0.12
NO_x-N, mg/L	0.476	0.100	0.38	1.30
Total P, mg/L	0.033	0.013	0.01	0.08
Dissolved P, mg/L	0.017	0.009	0.01	0.07
TOC, mg/L	2.32	0.54	1.4	4.5

Organic nitrogen values in 1983 at all stations were generally greater than those observed in other years with most values greater than 0.2 mg/L. Also, when combining organic nitrogen data over years, a trend was observed by river mile with downstream stations showing slightly lower values than those upstream. The following presents the results of Duncan's Multiple Range Test at the 0.05 level. River miles connected by a horizontal line were found to have mean organic nitrogen values statistically indistinguishable from each other. All three stations located above the WBN discharge point were higher than any of the four downstream stations.

River mile	528.0[a]	532.1[a]	529.5[a]	527.4	496.5	518.0	506.6
Mean Org-N (mg/L)	0.223[a]	0.192[a]	0.186[a]	0.153	0.136	0.129	0.103

a. Upstream from WBN discharge.

Ammonia nitrogen showed an opposite trend, with all three upstream stations averaging less than the averages for the four downstream stations. These differences were, however, statistically indistinguishable at the 0.05 level. The maximum mean was found at TRM 527.4 with 0.480 mg/L and the minimum 0.6 miles upstream at TRM 528.0 with 0.227 mg/L.

Nitrate plus nitrite means at the various stations only showed statistically significant (0.05 level) differences when comparing TRM 527.4 (mean = 0.533 mg/L) to either station TRM 528.0 (0.441 mg/L) or TRM 496.5 (0.426 mg/L). All other combinations of stations were indistinguishable from each other and there were no trends with river mile.

Total phosphorus was slightly higher in 1984 (most values between 0.04 and 0.08 mg/L) than previous values which were in the 0.01 to 0.04 mg/L range. Means at individual stations were statistically indistinguishable from each other although all three stations above WBN had greater mean values than the four downstream stations.

Dissolved phosphorus over time and by station remained quite consistent with all values except one ranging from less than 0.01 to 0.03 mg/L. The maximum value of 0.07 mg/L was found at the surface of TRM 532.1, 37-percent horizontal location in 1984.

TOC values were on an average the lowest in February and were consistent in the seven stations and over the different years sampled.

May--Observed May means and ranges for the various nutrients were as follows:

	Mean	SD	Minimum	Maximum
Org-N, mg/L	0.193	0.137	0.04	1.65
NH_x-N, mg/L	0.070	0.038	0.01	0.28
NO_x-N, mg/L	0.279	0.086	0.02	0.66
Total P, mg/L	0.022	0.008	0.01	0.04
Dissolved P, mg/L	0.011	0.003	0.01	0.02
TOC, mg/L	2.57	0.88	1.1	5.4

Organic nitrogen values observed in 1982 were higher than those in other years. Values observed in 1982 ranged from 0.30 to 1.65 mg/L while those in other years ranged from 0.04 to 0.30 mg/L. There was also little difference by stations except for the mean at TRM 532.1 (0.280 mg/L) and those at TRM 527.4 (0.158 mg/L) and TRM 496.5 (0.145 mg/L). All other station means fell between these extremes and were statistically indistinguishable.

Ammonia nitrogen values in 1982 were also high with five values exceeding 0.13 mg/L, the highest value in other years. Also, the station in Watts Bar Reservoir (TRM 532.1) averaged 0.0329 mg/L and was significantly lower (0.05 level) than any other station in 1982. All six stations were statistically indistinguishable with means ranging from 0.588 mg/L at TRM 496.5 to 0.085 mg/L at TRM 528.0.

Nitrate plus nitrite nitrogen remained relatively constant over all years and all stations with most observations between 0.1 and 0.4 mg/L. Only 2 of 117 May observations were greater than 0.45 mg/L with the maximum of these at 0.66 mg/L.

Total phosphorus showed no significant differences over the seven stations. The range of values was 0.01 to 0.04 mg/L with the laboratory reporting data to the nearest 0.01 mg/L.

Dissolved phosphorus ranged from 0.01 to 0.02 mg/L and showed no significant differences over the seven stations. Again the laboratory only reports data to the nearest 0.01 mg/L with 0.01 mg/L as the lower detection limit.

TOC showed no significant differences over the seven stations or over the various years data were collected.

August--Observed means and ranges for the various nutrients were as follows:

	Mean	SD	Minimum	Maximum
Org-N, mg/L	0.205	0.158	0.05	1.40
NH_x-N, mg/L	0.049	0.049	0.01	0.43
NO_x-N, mg/L	0.306	0.403	0.01	3.50
Total P, mg/L	0.022	0.007	0.01	0.05
Dissolved P, mg/L	0.011	0.003	0.01	0.02
TOC, mg/L	2.87	1.50	1.0	14.0

Organic nitrogen values in 1977 and 1982 were generally higher than those in other years. Excluding these years, organic nitrogen did not exceed 0.32 mg/L (19 of the 1977 and 1982 observations exceeded this value). No significant (0.05 level) differences between stations means were observed during the preoperational period.

Ammonia nitrogen, for the most part, was at or below 0.06 mg/L with only nine observations greater than 0.06 mg/L. Two of these in 1977, were at or near the maximum value of 0.43 mg/L. Comparison among stations showed that TRM 532.1 had a mean of 0.017 mg/L, which was significantly lower than that at TRMs 496.5 or 527.4. All other combinations of mean values were statistically indistinguishable.

The maximum ammonia concentration (0.43 mg/L) during preoperational monitoring was observed in August 1977 at TRM 496.5. However, it occurred at a pH of 7.1 and temperature of 25.5°C, and therefore was well below the aquatic life criterion, which would be 13.5 mg/L (as N) at this pH and temperature. (All elevated NH_3 concentrations occurred at pH and temperature levels such that the aquatic life criterion was easily met.)

Nitrate plus nitrite nitrogen values were all less than 0.05 mg/L except for three at TRM 527.4 made in 1973 and 1983. Also, the station with the lowest mean concentration was TRM 532.1 (mean = 0.099 mg/L) which had a significantly lower mean than the TRM 527.4 mean (mean = 0.476). All other combinations of stations were indistinguishable at the 0.05 level.

Total phosphorus in August was usually 0.03 mg/L or less. Only 3 of 75 measurements were greater than this and these three were less than or equal to 0.05 mg/L. There was not statistically significant (0.05 level) difference over stations with station means ranging from 0.20 to 0.024 mg/L.

All dissolved phosphorus observations in August were reported as 0.02, 0.01, or less than 0.01 mg/L and no statistically significant (0.05 level) differences were observed over stations.

TOC in August generally was less than 4.5 mg/L. Two observations in 1977 exceeded 10 mg/L (14 mg/L at TRM 506.6, 70-percent horizontal location at 3 m and 11 mg/L at TRM 496.5, 57-percent horizontal location at 1 m). Only three other observations exceeded 45 mg/L and these all occurred at the 3 m depth in 1982. No statistically significant (0.05 level) differences were observed over the stations sampled.

November--Observed November means and ranges for the various nutrients were as follows:

	Mean	SD	Minimum	Maximum
Org-N, mg/L	0.135	0.069	0.03	0.34
NH_x-N, mg/L	0.062	0.055	0.01	0.35
NO_x-N, mg/L	0.298	0.057	0.18	0.44
Total P, mg/L	0.027	0.007	0.01	0.05
Dissolved P, mg/L	0.012	0.005	0.01	0.03
TOC, mg/L	2.67	1.52	1.0	15.0

Organic nitrogen in November varied over a smaller range of values than in any other month and no statistically significant (0.05 level) differences were observed among stations.

Ammonia nitrogen values observed in November were generally less than 0.12 mg/L. Only nine values, all observed in 1977, exceeded this value. No statistically significant (0.05 level) differences were observed among the seven sampled stations.

Nitrate plus nitrite nitrogen values observed in November, similar to organic nitrogen, varied over the smallest range than any other month and no statistically significant (0.05 level) differences were observed among stations.

Total phosphorus observations in November were not too different from those observed at other times. Also, there were no statistically significant (0.05 level) differences among stations.

Dissolved phosphorus observations in November were 0.2 mg/L or less except for three observations (two in 1983 and one in 1976). These three were all 0.3 mg/L and were found over the range of 0.3- to 5-m depths. Station means for November ranged from 0.010 (TRM 496.5) to 0.163 mg/L (TRM 518.0). Stations at TRMs 518.0 and 506.6 were statistically different (0.05 level) from those at TRMs 528.0, 529.5, and 496.5. All other combinations of stations were indistinguishable (at the 0.5 level). Again it should be noted that the minimum detection limit was 0.01 mg/L with data reported to the nearest 0.01 mg/L, so observed statistical differences may be partially due to refinement of the laboratory analysis.

TOC observations in November usually ranged from 1 to 4 mg/L. Four values, all observed in 1982, were at or above 4 mg/L with one of them reaching 15 mg/L, the maximum value observed in any month during the WBN preoperational surveys. No statistically significant (0.05 level) differences were observed among stations.

Other Parameters--Statistics for minerals, metals, and other water quality parameters measured during the preoperational period are provided in appendices 4-B and 4-C. The range and mean values of minerals and metals determinations are summarized in table 4-5.

Table 4-1 shows standards and criteria for some minerals and metals. Standards and criteria for iron and manganese were exceeded several times in both upstream and downstream locations. Forty-two percent of the downstream measurements for iron exceeded the Secondary Drinking Water Standard (300 μg/L) while 67 percent of the upstream measurements exceeded the same standard. Similarly, 55 percent of the downstream manganese observations exceeded 50 µg/L as did 53 percent of the upstream observations. Three observations at TRM 529.9 or 3 percent of the upstream iron observations exceeded the 1000 µg/L criterion for the protection of aquatic life. One observation at TRM 527.4, or 1 percent of the downstream observations, exceeded this same criterion. These higher concentrations of iron and manganese, which were probably associated with oxidized forms (i.e., particulates), can be easily removed by conventional water treatment processes.

Measured concentrations of copper (Cu) have generally exceeded EPA's 1985 average and maximum criteria for protection of aquatic life at both upstream and downstream locations. Over half of all Cu observations had less than detectable amounts with these lower limits being either 5 or 10 µg/L depending on the analysis. Assuming that all values reported as less than 5 or 10 µg/L are zero, average values for Cu still remain higher than the above mentioned criteria. No Cu measurements exceeded the 1000 µg/L 1977 National Drinking Water Standard.

Table 4-1. Water Quality Criteria and Standards for Parameters Monitored During WBN Preoperational Monitoring

Parameter[a]	Aquatic Life Criteria Average	Aquatic Life Criteria Maximum	Human Health Criteria and Standards
pH (standard units)	6.0-9.0[b]	6.5-8.5[c]	6.5-8.5[d]
Nitrate (mg/L as N)	-	-	10[e]
Ammonia nitrogen (mg/L as N)	0.07[f,g]	0.48[f,g]	-
Chloride (mg/L)	-	-	250[d]
Sulfate (mg/L)	-	-	250[d]
Dissolved solids (mg/L)	-	-	500[d]
Dissolved oxygen (mg/L)	5.0[h]	-	-
Arsenic	190[f]	360[f]	0.022[i,j] 50[e]
Barium	NT[k]	NT[k]	1000[e]
Beryllium	5.3[i]	130[i]	68[i,j,i]
Cadmium	0.86[f]	2.6[f]	10[e,i]
Chromium	155[f,m,n]	1300[f,m,n]	50[e,i]
Copper	8.7[f,m]	12.7[f,m]	1000[d,i]
Iron	-	1000[o]	300[d,o]
Lead	2.2[f,m]	53[f,m]	50[e,i]
Manganese	-	1000[p]	50[d,o]
Mercury	0.012[f]	2.4[f]	0.114, 2[i,e]
Nickel	73[i,m]	1400[i,m]	13.4[i]
Selenium	35[i]	260[i]	10[e,i]
Silver	0.12[i]	2.2[i,m]	50[e,i]
Zinc	47[i]	240[i,m]	5000[d,i]

a. Units are µg/L unless otherwise noted.

b. Average not applicable to pH. Range given is State of Tennessee (1983) criteria for domestic raw water supply, industrial water supply, recreation, irrigation, livestock watering, and wildlife.

c. Tennessee (1983) criteria for protection of fish and aquatic life.

d. EPA National Secondary Drinking Water Standards (40 CFR Part 143).

e. EPA National Primary Drinking Water Standards (40 CFR Part 141).

f. EPA 1985 Water Quality Criteria (50 FR 30784; July 29, 1985).

Table 4-1 (Continued)

g. NH_3 as N at pH 9.0, and temperature of 30°C with sensitive coldwater species present; greater concentrations are allowable at lower pH and temperature and when coldwater fish are absent. See reference cited above in footnote "f" for further details.

h. DO criterion is the minimum standard established by State of Tennessee for the protection of fish and aquatic life.

i. EPA 1980 water quality criteria (45 FR 79318; November 28, 1980).

j. Value cited is 10^{-5} risk level, i.e., this level is projected to result in one additional cancer case per 100,000 population. Actual criterion for "maximum protection" is zero. See 45 FR 79318 for further details.

k. Not sufficiently toxic to aquatic life to warrant criteria.

l. criterion as corrected at 46 FR 40919; August 23, 1981.

m. Calculated for 70 mg/L hardness.

n. For Cr^{+3}, the species most commonly occurring in natural waters.

o. EPA (1976) Quality Criteria for Water ("Red Book").

p. McKee and Wolf (1983), Water Quality Criteria, California Water Quality Control Board.

Table 4-2. Summary of Watts Bar Nuclear Plant Nonradiological Water Quality Monitoring Program - Quarterly Sampling in Chickamauga and Watts Bar Reservoirs, 1973-86*

Tennessee River Mile	Horizontal† Location (%)	Sample Collection Depths (m)	Physical-Chemical Measurements	Period of Record
532.1	37	various	*In situ* monitor‡	Aug 73-Nov 77, May 82-Feb 86
	37	0.1, 1.0, 3.0, 5.0	Nutrients§	Feb 76-Nov 77, May 82-Feb 86
	85	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
529.9	90	various	*In situ* monitor	Aug 73-Nov 77, May 84-Feb 86
	90	0.1 or 1.0	Nutrients	Aug 73-Nov 77, May 84-Feb 86
	90	0.1 or 1.0	Minerals¶	Aug 73-Nov 77, May 82
	90	0.1 or 1.0	Metals#	Aug 73-Nov 77, May 82
529.5	20	various	*In situ* monitor	Feb 76-Nov 77, May 82-Feb 86
	20	0.1, 1.0, 3.0, 5.0	Nutrients	Feb 76-Nov 77, May 82-Feb 86
	20	0.1, 1.0, 3.0, 5.0	Minerals	Feb 84-Feb 86
	20	0.1, 1.0, 3.0, 5.0	Metals	Feb 84-Feb 86
	75	various	*In situ* monitor	Feb 84-Feb 86
	75	0.1 near bottom	Nutrients	Feb 84-Feb 86
	75	0.1 near bottom	Minerals	Feb 84-Feb 86
	75	0.1 near bottom	Metals	Feb 84-Feb 86
528.0	75	various	*In situ* monitor	May 76-May 77, May 82-Feb 86
	75	0.1, 1.0, 3.0, 5.0	Nutrients	May 76-May 77, May 82-Feb 86
	75	0.1 near bottom	Minerals	Feb 84-Feb 86
	75	0.1 near bottom	Metals	Feb 84-Feb 86
527.4	33	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	33	0.1 near bottom	Nutrients	Aug 73-Nov 77, May 82-Feb 86
	33	0.1 near bottom	Minerals	Aug 73-Nov 77, May 82-Feb 86
	33	0.1 near bottom	Metals	Aug 73-Nov 77, May 82-Feb 86
	67	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	67	0.1 near bottom	Nutrients	Aug 73-Nov 75
	67	0.1, 1.0, 3.0, 5.0	Nutrients	Feb 76-Nov 77, May 82-Feb 86
	67	0.1 near bottom	Minerals	Aug 73-Nov 77, May 82-Feb 86
	67	0.1 near bottom	Metals	Aug 73-Nov 77, May 82-Feb 86
518.0	33	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	67	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	67	0.1, 1.0, 3.0, 5.0	Nutrients	Feb 76-Nov 77, May 82-Feb 86
	67	0.1 near bottom	Minerals	Feb 84-Feb 86
	67	0.1 near bottom	Metals	Feb 84-Feb 86

Table 4-2 (Continued)

Tennessee River Mile	Horizontal† Location (%)	Sample Collection Depths (m)	Physical-Chemical Measurements	Period of Record
506.6	25	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	70	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	70	0.1, 1.0, 3.0, 5.0	Nutrients	Feb 76-Nov 77, May 82-Feb 86
496.5	30	various	*In situ* monitor	Aug 73-Nov 75
	57	various	*In situ* monitor	Aug 73-Nov 77, May 82-Feb 86
	57	0.1, 1.0, 3.0, 5.0	Nutrients	Feb 76-Nov 77, May 82-Feb 86

*February, May, August, November.

†Percent distance from left bank looking downstream.

‡Profiles of temperature and dissolved oxygen (DO) prior to 1976 and *in situ* profiles of temperature, DO, conductivity, and pH since.

§Nutrients (alkalinity, organic nitrogen, ammonia nitrogen, nitrite plus nitrate nitrogen, phosphorus, total organic carbon.

¶Minerals (sodium, chloride, sulfate, calcium, magnesium, potassium, silica)

#Metals (iron, manganese, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, zinc, aluminum, selenium, mercury.

Table 4-3. Analysis of Dissolved Oxygen (DO) at Watts Bar Dam (TRM 529.9) During 1973-1985 (All Units are mg/L)

Year	Number of DO Values in the Range of: 2.0-2.9*	3.0-3.9	4.0-4.9	≤5.0	Number of DO Values Total	May-Sep†	Percent of May-Sep DO Values ≤5.0
73	0	0	5	5	57	23	21.7
74	0	0	0	0	58	24	0
75	0	1	3	4	56	24	16.7
76	0	1	1	2	58	26	7.7
77	1	5	11	17	58	25	68.0
78	0	4	12	16	54	25	64.0
79	0	0	0	0	52	22	0
80	2	5	2	9	48	19	47.4
81	1	4	5	10	47	21	47.6
82	3	10	10	23	67	39	59.0
83	1	0	6	7	49	18	38.9
84	0	0	2	2	35	16	12.5
85	3	7	7	17	31	21	81.0
Total	11	37	64	112	670	303	37.0‡

*No DO values <2.0 mg/L were observed during 1973-85.

†All DO values <5.0 mg/L were observed during May through September.

‡Average percent of May through September DO values ≤5.0 mg/L)

Table 4-4. Analysis of Low DO Concentrations in the Vicinity of Watts Bar Nuclear Plant During 1973-85.

Tennessee River Mile	Number of DO values less than 5.0 mg/L at 5-ft depth	Total number of 5-ft depth values during summer months*	Percent of total that were <5.0 mg/L at 5-ft depth
529.5	4	6	67
528.0	3	6	50
527.4	4	9	44
518.0	5	9	56
506.6	5	9	56
496.5	2	11	18
Total	23	50	46

*"Summer months" = August for most of the quarterly surveys. No DO values less than 5.0 mg/L at 5-ft depth were observed in any months other than August.

Table 4-5. Range and Means of Minerals and Metals Measured on Watts Bar Preoperational Surveys (August 1973-November 1977, May 1982 - February 1986) - All Stations.

	n	x	SD	Minimum	Maximum
Calcium (mg/L)	270	20.8	4.1	8	40
Magnesium (mg/L)	270	4.94	0.90	2.3	8.7
Sodium (mg/L)	271	5.97	3.12	1.6	50
Potassium (mg/L)	271	1.41	0.23	0.90	2.2
Chloride (mg/L)	266	6.58	2.49	3	35
Sulfate (mg/L)	259	13.6	2.90	3	21
Silica (mg/L)	53	5.34	0.92	4.1	7.5
Iron (total)	277	346	344	10	4200
Iron (dissolved)	242	42.9	37.5	10	230
Fluoride (mg/L)	93	0.085	0.018	0.04	0.10
Arsenic	250	2.77	2.15	1.0	11
Barium	247	62.6	39.9	10	200
Beryllium	246	5.36	4.50	1.0	10
Boron	233	87.0	141.8	6	1000
Cadmium	246	0.711	1.108	0.10	13
Chromium	249	3.34	3.12	1.0	39
Cobalt	4	5	0	5	5
Copper	249	24.2	63.3	5	680
Lead	242	7.67	11.4	1.0	130
Manganese (total)	271	62.9	30.1	14	180
Manganese (dissolved)	110	19.6	17.4	10	90
Nickel	249	34.0	100.6	1.0	1200
Silver	247	8.02	3.95	0.20	10
Zinc	249	27.3	106.8	1.0	1600
Aluminum	247	347	351	50	2300
Selenium	250	1.38	0.86	1.0	10
Mercury	250	0.224	0.154	0.2	1.6

*Units are µg/L unless otherwise noted.

5.0 PLANKTON

Discharges from WBN may affect plankton in Chickamauga Reservoir. Preoperational sampling was conducted to describe natural variability associated with phytoplankton and zooplankton communities in the reservoir, and to document biologic trends occurring prior to operation of WBN. These preoperational data serve as the baseline to evaluate effects from operation of WBN.

5.1 Materials and Methods

Field--Phytoplankton monitoring during the preoperational period included estimates of extractable chlorophyll concentration, primary productivity (by C^{14} uptake), and organism density. Zooplankton monitoring evaluated organism density. Phytoplankton and zooplankton samples were collected quarterly at seven WBN stations from February 1973 through November 1977 and from May 1982 through November 1985. From upstream to downstream these stations were: TRM 532.1 (Watts Bar Reservoir forebay); TRM 529.5 (directly downstream of Watts Bar Dam); TRM 528.0 (at the intake to WBN); TRM 527.4 (directly downstream of the WBN submerged diffuser); TRM 518.0; TRM 506.6; and TRM 496.5.

In addition to data from WBN sample sites, some analyses used abundance data from stations associated with Sequoyah Nuclear Plant located at TRM 484.5 on Chickamauga Reservoir. Prior to 1985, three SQN sites (TRM 490.5, TRM 483.4, and TRM 478.2) were regularly sampled. In July 1985 two additional stations were incorporated into the SQN sampling scheme. These were at TRM 484.5 and TRM 472.8 (figure 5-1).

Phytoplankton samples were collected from mid-channel with an eight liter Van Dorn bottle at 0.3, 1, 3, and 5 m depths. Zooplankton samples were collected using a 0.5 m diameter plankton net fitted with #20 mesh (80 µm) nylon bolting cloth as described by Dycus and Wade (1977). During 1982-1985 phytoplankton and zooplankton samples were collected in triplicate, with phytoplankton preserved in M_3 (Meyer, 1971) and zooplankton in 10 percent Formalin. From 1973-1977 replicate phytoplankton samples were not collected and samples were preserved with 10 percent Formalin; however, zooplankton samples were collected in duplicate as described above.

From 1982-1985 triplicate chlorophyll samples were dosed with a magnesium carbonate suspension[1] and then filtered through 0.45 µm glass fiber filters. The filters were placed in darkened vials containing 5.0 ml of 90 percent buffered acetone and transported to the Laboratory Branch (LB) on dry ice. Chlorophyll analysis methods changed during the earlier years of the study, however the above procedures have been standardized and will be used during operational studies at WBN.

During the period 1982-1985, duplicate primary productivity samples from each depth (0.3, 1, 3, and 5 m) were inoculated with 1 ml (approximately 2 µCi) of C^{14}-labeled $NaHCO_3$ and incubated at the depth and station collected. Dark bottles to correct for non-photosynthetic carbon uptake were incubated with the light bottles at 0.3 m and 5 m depths. An attempt was made to incubate the samples for

1. One milliliter of $MgCO_3$ suspension was added to each quart cubitainer at the time of collection. The $MgCO_3$ suspension was prepared by adding 1.0g of $MgCO_3$ to 100 ml deionized water.

three to four hours around solar noon but field conditions often necessitated deviations from this routine. The actual length of incubation and period within the solar day were noted on field sheets so that the appropriate adjustments could be made in the productivity calculations. After incubation the samples were filtered on 0.45 μm pore size membrane filters. The filters were rinsed with 0.1N HCl, placed in scintillation vials, and transported to the Radiation Laboratory for analysis. During the 1973-1977 monitoring period, primary productivity samples from the various stations were all transported to TRM 532.1 (Watts Bar Reservoir forebay) for incubation at the appropriate collection depth. After incubation, the 1973-1977 samples were injected with 1 ml of 10 percent formalin to halt metabolism until the samples could be filtered. After filtration, the 0.45 μm pore size membrane filters were glued to planchets, placed in dessicators in a light-excluding box, and shipped to the Radiation Laboratory for analysis.

A portable pyroheliometer was used to record solar radiation from sunrise to sunset on days of primary productivity studies. On occasions when the pyroheliometer did not function properly, solar radiation data were retrieved from the Watts Bar meteorologic station. From 1982 to 1985 light penetration was measured with a Secchi disc and/or a submarine photometer.

<u>Laboratory</u>--Algal enumeration samples were mixed and a 15 ml aliquot allowed to settle in a settling chamber for a minimum of 12 hours. The algae were enumerated at the generic level using an inverted microscope. From 1973 to 1977, filamentous forms such as

Lyngbya, *Oscillatoria*, and *Melosira* were quantified for enumeration by dividing the filament length in microns by a factor of 100 (e.g., 2500 µm reported as 25, 250 µm reported as 3). *Oscillatoria* comprised over 90 percent of the specimens quantified by this method. Individual cells were counted for all genera for the period 1982-1985.

During 1982-85, chlorophyll sample filters were stored in acetone in a freezer prior to analysis. In 1973 and 1974 the filters were stored in a dessicator at 4° C; after May 1975 the unextracted filters were stored in a freezer.

For the period 1982-1985, chlorophyll extracts were brought to room temperature in the dark, and the filters ground with a glass rod and subjected to ultrasound to disrupt cell walls and ensure complete extraction. Samples were then centrifuged and the optical density of the supernatant was measured at 750, 664, 647, and 630 nm. The extract was then acidified with two drops of 0.1N HCl and the optical density at 750 and 665 nm was determined after one minute. Chlorophylls *a*, *b*, and *c* were calculated using the equations of Jeffrey and Humphrey (1975) and phaeophytin *a* and the phaeophytin index (PI) were calculated using the equations of Lorenzen (1967). During the 1973-1977 period, chlorophyll filters were extracted in the lab with 90 percent acetone for 24 hours in the dark at 4° C. When glass fiber filters were used in the field, the extract was filtered again through a glass fiber filter before spectrophotometric analysis. When cellulose acetate filters were used, the extract was centrifuged before analysis. From 1973 to 1977, chlorophylls *a*, *b*, and *c* were calculated using the equations of Parsons and Strickland

(1963). For the current analysis, 1973-1977 chlorophyll values were recalculated to make them more comparable to the data collected in 1982-1985. Phaeopigments were not analyzed prior to 1982.

Radioactivity of primary productivity samples was determined by liquid scintillation during 1982-1985 and by a thin-window, low-background, gas-flow proportional counter in 1973-1977. Total alkalinity, pH, and temperature were used to calculate available inorganic carbon using the tables of Bachman (1962) for 1973-1977 and Saunders, et al. (1962) for 1982-1984. Net photosynthetic activity in $mgC/m^3/hr$ was determined by subtracting dark bottle C^{14} activity from light bottle activity. Net photosynthetic activity was averaged for depth intervals, multiplied by the respective depth interval, summed, and proportioned to daily solar radiation to estimate the daily areal productivity, expressed as $mgC/m^2/day$ (Steeman-Neilson, 1952).

Zooplankton samples were diluted or concentrated, depending on the abundance of detritus and organisms. Four 1-ml subsamples were taken from each magnetically stirred sample using a 1-ml Hensen-Stempel pipette, and each subsample was placed in a Sedgewick Rafter cell. Organisms were enumerated at the lowest practical taxonomic level, usually species, on a compound microscope at 35 X or 50 X. After sub-sample enumeration, the remainder of the sample was scanned under a dissecting microscope at 14 X for additional taxa not encountered in sub-sampling. Resultant counts were extrapolated to numbers per cubic meter.

Data Analysis--Varability among samples for enumerations (both phytoplankton and zooplankton), chlorophyll *a* concentrations, and primary productivity estimates was evaluated by the coefficient of variation. Coefficients greater than 40 percent indicated less than desirable replicability.

Replicate phytoplankton samples for a given depth, station and date were not collected prior to 1982, although replicate zooplankton samples existed for the entire study period. However, because of the intensity of vertical mixing, a judgement was made to use phytoplankton samples collected at the various depths at a single station as replicates for the purpose of statistical analysis. This assumption is consistent with what is known about the hydraulics of the reservoir and allows statistical comparisons among stations by analysis of variance (ANOVA). All numerical phytoplankton data[1] were log transformed before statistical analysis to ensure a normal distribution[2], then subjected to a one-way ANOVA using station as the class variable. A Student-Newman-Keul's test (SNK) was used to rank and find significant differences among station means. A 95 percent confidence level was used for all analyses. By convention, the SNK test was conducted on log transformed means, but arithmetic means have been used in the tables to give a quantitative

1. Total algae (10^6 cells/liter), chlorophyll $\underline{a}$ (mg/m^3), primary productivity ($mgC/m^2/day$), Chrysophyta present (10^6 cells/liter), Chlorophyta present (10^6 cells/liter), and Cyanophyta present (10^6 cells/liter).

2. Because the chlorophyll data set included values of '0.0', the arbitrary value '1.0' was added to each concentration before log transformation.

indication of the central tendency of the data. Similar procedures were used on zooplankton data, except a $\log_{10}$ transformation was used.

Pielou's percentage similarity index (Pielou, 1975), Sorenson's quotient of similarity (McCain, 1975) and a form of the Shannon diversity index (Patten, 1962) were used to analyze phytoplankton and zooplankton community structures. Pielou's percent similarity (PS) was computed as follows:

$$PS = 200 \sum_{i=1}^{s} \min (P_{ix}, P_{iy})$$

where P_{ix} and P_{iy} are the quantities of genus i at stations x and y as proportions of the quantities of all s genera at the two stations combined.

The index is based on both qualitative and quantitative community characteristics and values of 70 percent or greater were assumed to show similarity.

Sorenson's quotient of similarity (SQS) was calculated as follows:

$$SQS = 2s/(x + y) \times 100$$

where x = number of genera at station X

y = number of genera at station Y

s = number of genera in common between stations X and Y.

This index is based solely on qualitative community characteristics (i.e., genus presence/absence) and values of 70 percent or greater were assumed to show similarity. If comparisons between two stations provided low SQS and PS values, the communities should be considered different. If the SQS value is high but PS is low, the communities are composed of similar genera but differ either in total abundance or relative abundance of genera present. When SQS is low and PS is high, communities may still be considered similar because the low SQS value probably reflects the random occurrence of rare genera which affect SQS values more than PS values. If both SQS and PS values are high, the communities are similar in generic composition, relative abundance of genera, and total algae abundance.

Diversity index values (d bar) were calculated as follows:

$$\bar{d} = -\sum_{1}^{s} (n_i/n) \log_2 (n_i/n)$$

where s = number of genera collected

n_i = number of individuals belonging to the i^{th} genus

n = total number of organisms

d bar = diversity per individual

Transformed ($\log_{10}X+1$) abundance values (total abundance and abundance by season) for seven WBN and three SQN sites (five for July 1985 data) were subjected to first and second order regression analysis. Because of several inconsistencies in the data set phytoplankton numbers from the 1.0 meter sample only were used in the regressions. Zooplankton samples were collected as continuous tows from near bottom to the surface, consequently the composition of the mixed sample at each station was used for the regressions.

5.2.1 Phytoplankton Results and Discussions

Phytoplankton communities respond rapidly to changing environmental conditions and are capable of demonstrating variation in abundance and/or physiological state within a short period of time, i.e., a week or even days (Wade 1984). However consistent effort over a period of years enables documentation of trends within the phytoplankton community to be used in evaluating effects of WBN on Chickamauga Reservoir. While seasonal patterns (winter, spring, summer, autumn) over years (1973-1977 and 1982-1985) provide inferences about annual periodicity, year to year changes document long-term variations within the river reach. Phytoplankton analyses addressed four community parameters in an inclusive (i.e., long-term) sense. These parameters (community structure, abundance, chlorophyll biomass, and primary productivity) were used to describe long-term temporal (year-to-year) and spatial differences observed in the study area. Seasonal descriptions of the phytoplankton assemblage provided baseline information so that any operational changes in numbers, composition, diversity and phytoplankton similarity indices can be quantified. Although phytoplankton results and discussions will generally address spatial, seasonal, and long-term aspects of the assemblage, specific data presented in appendices allow examination of individual samples which can be compared with physical and chemical parameters discussed in Chapters 2.0 and 4.0, respectively.

Long-term Temporal Trends in WBN Study Reach Phytoplankton

During preoperational monitoring, 124 phytoplankton genera were identified from the Watts Bar forebay and one or more Chickamauga Reservoir channel habitats in the vicinity of WBN (table 5-1). Taxonomically these genera were distributed as follows:

Group	Number Genera
Chlorophyta	63
Chrysophyta	31
Cryptophyta	2
Cyanophyta	20
Euglenophyta	4
Pyrrophyta	4

Twenty-two of the 124 genera accounted for over 88 percent of the total phytoplankton abundance during one or more collection period(s). These genera comprised the numerically important segment of the community and have been designated dominant forms. They are:

Chlorophyta

Ankistrodesmus	*Coelastrum*	*Pandorina*
Chlamydomonas	*Dictyosphaerium*	*Pediastrum*
Chlorella	*Kirchneriella*	*Scenedesmus*

Chrysophyta

Asterionella	*Melosira*	*Synedra*
Cyclotella	*Stephanodiscus*	
Dinobryon	*Fragilaria*	

Cyanophyta

Anacystis	*Lyngbya*	*Oscillatoria*
Dactylococcopsis	*Merismopedia*	*Raphidiopsis*

Comparisons of stations using Sorensen's Quotient of Similarity (SQS) showed a generally increasing trend in similarity from 1973-1985 (see appendix 5-A). Pielou's community similarity test showed percentage similarity (PS) to be lower than indicated by SQS comparisons with only 39 percent of possible combinations similar at the 70 percent level or greater (appendix 5-B). These data are summarized by year as follows:

Year	SQS No. Comparisons Similar/Possible	SQS Percent	PS No. Comparisons Similar/Possible	PS Percent
1973	56/84	67	43/84	51
1974	39/84	46	26/84	31
1975	46/84	55	17/84	20
1976	40/84	48	43/84	51
1977	59/84	70	39/84	46
1982	51/63	81	11/63	18
1983	59/84	70	28/84	33
1984	55/84	66	39/84	46
1985	80/84	95	42/84	50
Total	485/735	66	288/735	39

Similarity indices (SQS) were determined for each sample station by season over the time period 1973-1985 (appendix 5-A). These calculations showed dissimilarity among stations to be greatest during the transition seasons (spring and autumn).

Diversity index values for phytoplankton ranged from 0.35 in May, 1975 (TRM 506.6 at 3m depth) to 4.40 in August, 1985 (TRM 496.5 at 5m depth) (appendix 5-C). In one instance (TRM 532.1 at 5 meters) in November 1977, no diversity index was calculated because only one taxon was present in the samples. The greatest number of genera (59) occurred at TRM 532.1 during 1985. Habitat at TRM 532.1, located in the Watts Bar Reservoir forebay area, is lentic and unlike the mixed, lotic environment in the vicinity of WBN. Phytoplankton data from TRM 532.1 were expected to differ from stations near WBN. However, TRM 532.1 was included in the monitoring program as the primary source of plankton in the vicinity of WBN.

Diversity Summary

Year	Range of Genera	Range of Diversity	Low/High Month
1973	5-30	0.53-4.10	Feb/Aug
1974	3-20	0.91-3.17	May/Aug
1975	4-39	0.35-4.23	May/Aug
1976	4-44	0.75-3.87	Feb/Aug
1977	1-51	0.00-4.21	Nov/Aug
1982	12-41	1.03-3.55	Aug/May
1983	10-39	1.84-3.74	Nov/Aug
1984	9-43	0.67-4.01	May/Feb
1985	14-59	1.89-4.40	Nov/Aug

Overall, diversity indices were good with only 29 of 976 values less than 1.0, however only 22 indices were greater than 4.0. These data show the system to be relatively consistent with respect to taxa present.

Phytoplankton community structure showing seasonal succession of the three dominant groups (Chlorophyta, Chrysophyta and Cyanophyta) for 1973 through 1985 is in figure 5-2 through figure 5-5 and table 5-2. The other three groups (Cryptophyta, Euglenophyta, and Pyrrophyta) have been combined and designated as "other" because they generally comprised a small percentage of phytoplankton abundance. These percentage composition data represent average abundance of all seven stations; however individual sample values at each location are in appendix 5-D.

In 1973 and 1974, phytoplankton was dominated by Chrysophyta (table 5-2). The only exception was August 1973 when Chlorophyta (primarily *Scenedesmus*) dominated. In all cases where chrysophytes were the dominant group, the most prevalent genus was *Melosira* and only once (August 1973) did

Cyanophyta (30.9 percent) comprise substantially more than 5 percent of the community (table 5-2).

Melosira was usually the dominant chrysophyte genus throughout the entire preoperational period (appendix 5-D) and Chrysophyta tended to dominate the assemblage except for the summer season (table 5-2). In summer, Cyanophyta frequently was dominant. This dominance sometimes persisted into autumn (1977 and 1985; table 5-2). Dominant cyanophytes varied from year to year but were comprised primarily of Dactylococcopsis (1973), Anacystis (1975, 1976, 1977), Raphidiopsis (1982 and 1984) and Oscillatoria (1983 and 1985) (appendix 5-D).

Generally the other phytoplankton groups (Cryptophyta, Euglenophyta and Pyrrophyta) were present in the assemblage but were sparse (appenix 5-D). However during four of the thirty-six quarters of sampling these groups comprised 10 percent or more of the assemblage. These were: winter of 1975 with 10.56 percent, primarily Euglenophyta; spring of 1982 with 46.25 percent, primarily Cryptophyta; autumn of 1982 with 15.75 percent, primarily Cryptophyta and autumn of 1985 with 12.18 percent, primarily Cryptophyta (figure 5-3). Also, during four quarterly samples the group Chlorophyta was dominant. These quarters were: summer of 1973 (38.76 percent); summer (41.6 percent) and autumn (39.4 percent) of 1975; and autumn of 1984 (54.2 percent) (table 5-2).

When percentage composition was determined (seasons combined) by group at each station within each year some changes in the Tennessee River in the vicinity of WBN became apparent (figures 5-6 through 5-8). Beginning in 1973, phytoplankton were dominated by Chrysophyta (figure 5-6) or Chrysophyta and Chlorophyta, however the system gradually shifted to an entirely different community in later years (figure 5-7). No phytoplankton samples were collected from 1978-1981, and when sampling was resumed in 1982 the assemblage was more eutrophic (figure 5-8). The system (particularly the upstream stations) was totally dominated by cyanophytes with the cryptophyte, Chroomonas, as second in abundance, particularly at TRM 496.5 and TRM 506.6 (appendix 5-D). Cyanophyte dominance moderated in 1983 (table 5-2) but became reestablished in subsequent years (figure 5-8). These figures document a successional change in this reach of the Tennessee River wherein the phytoplankton community changes from a chrysophyte dominated system to a cyanophyte dominated one. There occurs also a gradual shift among stations from over 60 percent cyanophyta (TRM 532.1) to less than 40 percent Cyanophyta (TRM 496.5) (see 1983, table 5-2). This spatial pattern was repeated more (1982) or less (1976) throughout the entire preoperational monitoring period. Cyanophyte dominance in the vicinity of WBN suggests eutrophication; however, because of water travel times this eutrophication is also undoubtedly a reflection of conditions upstream of WBN in Watts Bar Reservoir.

Phytoplankton Abundance--The abundance of phytoplankton communities varies with intensity and duration of available light, quality and quantity of nutrients present in the water column, temperature, current, and the hydrographic configuration of the system. To evaluate differences in phytoplankton abundance, log transformed data were subjected to four-way analysis of variance for population changes at location (river mile), depth, season (quarter), and year. In order to balance the data set only one abundance replicate value was used for each combination of the four test parameters, and 1982 was excluded because winter quarter data were not collected.

Total phytoplankton abundance in the Tennessee River near WBN exhibited significant differences for all main effects except depth (i.e., river mile, season, and year) (table 5-3). A significant interaction also occurred between year and season. This interaction showed, and the abundance data (appendix 5-D) verified, a system with significantly greater numbers present each summer throughout all years than in other seasons. Abundance followed the general trend observed in Sorenson's analyses where highest SQS values were observed in summer followed by the winter season, then spring and autumn in descending order of similarity. The pattern differed in that the SNK Multiple Range Test showed spring and autumn not significantly different from each other.

Year to year differences in total phytoplankton abundance showed 1985 had significantly more phytoplankton ($\alpha = 0.05$) than other years. Abundance in 1974 and 1973 was similar but significantly lower than other years (table 5-3, appendix 5-D). The year to year changes in phytoplankton abundance by sample station, including stations sampled as part of the SQN monitoring effort, are in figures 5-9 through 5-17. These figures show the differences in year by year, seasonal, and river mile ANOVA (table 5-3). Fewest overall numbers of phytoplankton (0.07×10^6 cells liter) were collected at TRM 496.5 during the autumn of 1983 (figure 5-15) and TRM 506.6 during autumn of 1984 (figure 5-16). Greatest numbers (24.93×10^6 cells/liter) were taken in the summer of 1982 at TRM 532.1 (figure 5-14).

Generally summer was the most productive season with the highest community similarity (appendices 5-A and 5-B) and diversity (appendix 5-C). However, presence/absence data (appendix 5-D) and abundance figures

(figures 5-9 through 5-17) show a pattern of between station variability in phytoplankton numbers. Abundance patterns among stations show TRM 532.1 as most productive and TRM's 496.5 and 506.5 as least (table 5-3).

This pattern persisted in other seasons (figure 5-10, spring and 5-13, autumn) with general declines in numbers from upstream to TRM 496.5. However, those stations associated with SQN (TRM's 478.2, 483.4 and 490.5) often showed a pattern of increasing numbers in a downstream direction. This trend is evident at SQN stations "A" (TRM 472.8) through "E" (TRM 490.5) in figures 5-9 through 5-17. These data indicate the effects of discharging deeper strata waters from Watts Bar Reservoir and the importance of reduced flows (increased retention time) to plankton production in Chickamauga Reservoir.

Spatial trends of phytoplankton abundance were further examined using total numbers collected at 1.0 meter depths over years and by seasons within years. These data were regressed against the seven stations in the WBN preoperational data set and stations 1 (TRM 478.2), 2 (TRM 483.4), and 3 (TRM 490.5) of the SQN preoperational and operational data set. Total yearly abundance and abundance by season were examined. Several years, as well as seasons within years, showed significant non-linear regressions of the general quadratic form. Appropriate constants of the equation:

$$y = a + b\,x + c\,x^2$$

where "y" is the logarithm of estimated abundance and "x" is the sample station (e.g., TRM 472.8 . . . TRM 532.1), are presented in appendix 5-E. The $P > F$ values (significance) of regressions are summarized below. Regressions significant at $\alpha = 0.05$ are marked "*."

Year	Total Abundance	Abundance by Season Winter	Spring	Summer	Autumn
1973	0.0682	0.5341	0.0156*	0.0032*	0.0017*
1974	0.0757	0.0357*	0.0311*	0.0277*	0.0072*
1975	0.1069	0.2351	0.0118*	0.0301*	0.2034
1976	0.7534	0.6978	0.4055	0.0773	0.0464*
1977	0.2139	0.0113*	0.6629	0.4933	0.0001*
1982	0.0115*	0.2879†	0.0007*	0.0001*	0.0001*
1983	0.0014*	0.2912	0.0001*	0.0001*	0.0001*
1984	0.0081*	0.0027*	0.0001*	0.0001*	0.0065*
1985	0.4122	0.8599	0.0020*	0.0001*	0.0526

*Significant at $\alpha = 0.05$.
†Three SQN stations only.

Because many F-values were significant, especially in the seasonal regressions, they will be addressed in the seasonal discussions. However, those years where significant departures from the hypothesis of no difference among stations for total numbers occurred, coincided with the operational years for SQN. Operation of SQN could not have influenced phytoplankton abundance in the vicinity of WBN. In the well mixed, relatively fast flowing riverine portion of Chickamauga Reservoir near WBN, residence time in the euphotic zone was inadequate for phytoplankton growth and reproduction. Therefore, if operational impacts to the phytoplankton community occur, they likely will not be apparent in this portion of the reservoir under flow conditions. Downstream from where the reservoir becomes more lacustrine to the forebay of Chickamauga Reservoir slower flows permit phytoplankton abundance to increase.

Chlorophyll Biomass--Because of several changes in field and laboratory procedures, chlorophyll data were not comparable over time. Within years these data were variable with respect to both seasonal and spatial biomass both among stations and among seasons (appendix 5-F). Although not evaluated quantitatively, the chlorophyll data provided several qualitative insights into overall production of phytoplankton. Chlorophyll a values were generally greatest in the Watts Bar forebay area (TRM 532.1) and least at the most downstream station in Chickamauga (TRM 496.5). During most years chlorophyll biomass was directly correlated with abundance (appendices 5-D and 5-F). Maximum chlorophyll a concentrations recorded each year are summarized as follows.

Year	No. Values $\geq$ 10 mg/m^3	Highest Concentration	Site
1973	None	6.56 mg/m^3	529.5
1974	1	10.76 mg/m^3	532.1
1975	None	7.63 mg/m^3	532.1
1976	4	15.91 mg/m^3	532.1
1977	29	17.34 mg/m^3	532.1
1982	27	23.87 mg/m^3	532.1
1983	13	14.18 mg/m^3	532.1
1984	31	15.46 mg/m^3	532.1
1985	49	21.20 mg/m^3	532.1

The number of chlorophyll a concentrations greater than 10 mg/m^3 has been increasing steadily over the years at TRM 532.1. Similar trends were also documented at other sample sites in the vicinity of WBN (appendix 5-F). These concentrations, in the 10-30 mg/m^3 range suggested by Vincent (1981) as indicative of potential eutrophication, occurred only rarely prior to 1977; however their incidence has increased since that time.

The relationship between chlorophyll a and phaeophytin a (a degradation product of chlorophyll a) expressed as a phaeophytin index (PI) provides inferences about the physiological status of the assemblage. Phaeophytin indices were determined for samples collected from 1982 to present (appendix 5-F). PI values near 1.7 (the theoretical maximum) imply populations consisting of mainly intact, non-decaying organisms, whereas values near 1.0 (theoretical minimum) indicate little or no active chlorophyll a.

Except for an occasional high PI value, moderate to large relative amounts of phaeophytin a (PI $<$ 1.6) were present at all stations and depths during autumn quarters throughout the period 1983 - 1985 and for all of 1982. Lower PI values, indicative of aging or physiologically stressed algae, would be consistent with high residence time and potential mechanical breakage of phytoplankton. High PI values $>$ 1.6 (in some cases PI values exceeded the theoretical maximum of 1.7) were observed during winter (except for TRM 532.1 in 1985), a period of reduced river elevation and reduced residence time throughout the study reach. These phaeophytin values show the assemblage had responded to physical influences related to season.

Primary Production--Primary production provides a measure of the photosynthetic activity in the water column. Primary production data were summarized into hourly and daily carbon assimilation (appendix 5-G) and expressed as the amount of carbon incorporated by phytoplankton in a square meter area, to a depth of five meters, for an entire day. This technique not only considers the amounts of light available during incubation and for the day, but also integrates depths within the euphotic zone. This zone, defined as the depth to which one percent of surface light penetrates (Jasper, et. al, 1983), roughly correlates with Secchi depth measurements reported in chapter 2 and appendix 2-A of this report.

Unfortunately the entire data set was statistically unbalanced, but could be balanced for analytical purposes over five of nine years (not consecutive) for seven WBN stations for each depth and season. One replicate was used for each of the 560 combinations of the four parameters, and ANOVA of main effects and interactions calculated. The error mean square for the four-way interaction was used to determine F-statistics for secondary interactions. Too few observations (< 7) did not permit any pattern to be observed among secondary interactions, consequently, they were not included in the discussion. Significance of the tests was determined by probabilities of exceeding the F-statistic at the 0.001 level and are summarized in table 5-4. The least significant difference (LSD) test at the 99 percent significance level was used to locate differences among means for each significant F-test. A summary of the treatment means results and 99 percent LSD values is given in table 5-5 with means having the same alpha- betic letter not being significantly different.

The analysis of main effects means is valuable to give an overall view of the system. Each main effect is pooled over the other parameters.

River Mile--Photosynthetic activity varied with respect to river mile, with the most activity occurring in the Watts Bar forebay at TRM 532.1 (table 5-5, comparison I). However, river miles could not be easily sorted out on the basis of photosynthetic activity for the river miles (stations) below the dam because of similarities in activity among some stations. TRM 527.4 and TRM 528.0 were similar but TRM 528.0 could not be distinguished from TRM 529.5 and TRM 518.0, while TRM's 529.5 and 518.0 were similar. Primary production at TRM 496.5 and TRM 506.5 could not be separated statistically. These results confirm the lacustrine forebay is more photosynthetically active than the area below the dam. The fact that production is somewhat varied among the riverine stations indicates localized differences between the upper and lower river stations (e.g., TRM 527.4 was similar to TRM 528.0 but not to 529.5, while TRM 529.5 was similar to 528.0 and to all the lower stations). Inspection of the area shows Dake Branch enters the Tennessee River slightly below TRM 528.0. River configuration suggests this creek has potential photosynthetic influence on the TRM 527.4 sample site, which may relate to the slightly higher phytoplankton production at TRM 527.4 when compared to TRM 529.5 (table 5-5, comparison I).

Years--As demonstrated in table 5-5, comparison II, photosynthetic activity was not constant for the years examined. The high variability of turbidity, flow, nutrients, and available light among years (appendix 2-A) coupled with large fluctuations of photosynthesis within years (2 mgC/m^2/day to 1652 mgC/m^2/day) tended to confuse relationships between years. Based on L.S.D. tests annual primary production showed 1974 < 1983 < 1976 < 1973 < 1977 where years not underlined by a continuous line are significantly different.

Season--Because data were collected at about the same time each quarter, the 140 observations per quarter present credibility in showing seasonal photosynthetic activity. Quantitative results of primary production will be discussed in the respective seasonal sections, however lowest overall activity was observed in November and February with virtually no difference in production between those months. Nearly twice as much photosynthetic activity occurred in May (spring) while productivity nearly tripled in August (table 5-5, comparison III).

Depth--Vertical stratification of photosynthetic activity varies with the penetration of light through the water column (table 5-5, comparison IV). These data showed primary production to be similar at the three and five meter depths (table 5-5, appendix G) and more than 7 times greater at the upper levels (0.3 and 1.0 meters).

Analysis of primary interactions allows for the combination of two factors such that data are stratified in two planes to reveal more complex associations between controlling variables. The word "by" in the interaction term describes arrangement of the variables. For example, river mile by year indicates the data are stratified by year for each river mile, allowing one to examine annual photosynthetic activities for any station. Seasonal analyses (e.g., river mile by month, year by month, and depth by month) of primary interactions are addressed within the respective seasonal discussions.

River Mile By Year--Photosynthetic activity was relatively constant for all years examined for TRM 496.5, the most downstream WBN station and TRM 529.5 just below Watts Bar Dam. This constancy, although at slightly different productivity levels, was also observed for TRM's 506.5, and 518.0. TRM 527.4 and TRM 528.0 showed no consistent pattern through time. Examination of photosynthetic activity for the forebay station (TRM 532.1) shows quite a different pattern. Annual changes become more prominent in the quieter waters above Watts Bar Dam showing highest photosynthetic activity in 1977, lowest in 1983 and gradations in activity among all years.

River Mile By Depth--Analysis of the primary productivity data by depth for each river mile does not indicate how well mixed this portion of the river is vertically. It has been conceded the river was well-mixed. At all sample stations except TRM 506.5, approximately seven times as much primary production was measured at the surface and one meter depth, which were not statistically different, as occurred at the three and five meter depths, which were also mutually indistinguishable (table 5-5, comparison VII).

Year By Depth--Some year to year variability was present, however photosynthesis was generally similar for all years at five meters and at three meters (comparison IX, table 5-5). At the one meter depth productivity was greatest in 1977 and least in 1973, whereas productivity at the surface (0.3 meters depth) was nearly three times greater in 1973 and 1977 than for the rest of the years at that depth. The euphotic zone, at least the layer of greatest photosynthetic activity, apparently is limited to the surface and one meter depths for this reach of the Tennessee River.

During analysis of phytoplankton abundance data, an ANOVA showed that of the main effects (i.e., river mile (station), year, depth, and month (quarter) only depth was not significant at the 0.001 level or greater (table 5-3). Primary productivity analyses showed vertical differences in phytosynthetic activity at all sites except TRM 506.5 (comparison VIII, table 5-5) and throughout years.

The primary productivity values reported here show that given reduced flow, the phytoplankton grow and reproduce in a manner directly related to available light and nutrients. Dense phytoplankton communities do not persist in the riverine reaches of WBN because high water velocities and associated turbulence prevent algal cells staying in the euphotic zone long enough for growth to occur. However as reservoir cross-sectional area increases, phytoplankters remain in the photic zone longer and can effect growth and reproduction. This point in the reservoir is usually downstream from TRM 496.5, however, in low flow conditions increased numbers of phytoplankton may be observed further upstream nearer WBN (e.g., winter 1976, 1977, and spring 1985).

Seasonal Descriptions of Phytoplankton within the WBN Study Reach

Biologically the phytoplankton assemblage in the vicinity of WBN showed consistency among stations but considerable variability among seasons (figure 5-2 through 5-5). ANOVA showed the seasonal progression of phytoplankton abundance to be summer > winter > spring > autumn with winter being significantly more abundant than spring (table 5-3). Results presented include short-term temporal and spatial comparisons of seven WBN sample stations beginning at TRM 496.5 (station 4) and progressing upstream to TRM 532.1 (station 10). Stations 1 through 3 were part of the SQN monitoring plan in Chickamauga Reservoir and were used as data sources for examining changes in reservoir-wide phytoplankton abundance.

Winter--Physical conditions varied considerably during winter with flows well below normal in 1977 and 1984, less than normal (1976 and 1985) to normal (1983) and significantly greater than normal in 1974 and 1975. Because of reduced water elevations and generally greater average water velocities in winter, travel times between TRM 532.1 (station 10) and TRM 496.5 (station 4) were shorter than at other times of the year, ranging between 20 hours (1975) and 2.8 days (1976). Other physical and chemical parameters are discussed in chapter 2 and documented in appendix 2-A.

Phytoplankton densities in winter were exceeded only by summer numbers and were usually dominated by the chrysophyte *Melosira* at each station with Chlorophyta (*Chlorella*) and Cyanophyta (primarily

Oscillatoria) being second and third in abundance (appendix 5-D and figure 5-2). In 1983 *Oscillatoria* was dominant at TRM's 532.1, 528.0 and 506.6 however overall phytoplankton abundance was relatively low (range 0.36×10^6 and 0.66×10^6 cells/liter, and the analyses showed no consistent pattern among the three stations. Generally, winter phytoplankton abundance was low during 1973 (figure 5-9), 1974 (figure 5-10), 1975 (figure 5-11), 1982 (figure 5-14), 1983 (figure 5-15) and 1985 (figure 5-17) with few samples exceeding 1.0×10^6 cells/liter. However, in 1976 (figure 5-12), 1977 (figure 5-13) and 1984 (figure 5-16) numbers were moderate to moderately abundant (range 0.92×10^6 to 9.58×10^6 cells/liter) and were comprised primarily of chrysophytes (see also table 5-2). When winter river velocities were highest (> 68,000 cfs in 1974 and 85,000 cfs in 1975), fewest organisms were collected (range 0.10×10^6 to 0.36×10^6 cells/liter) suggesting washout related to the high flows.

Diversity index values were usually lower during the earlier sample years (1973-1977) ranging between 0.6 and 2.99 while the 1982-1985 period ranged between 2.02 and 3.83. The seven WBN stations showed a high winter diversity index of 3.83 (1984, TRM 532.1) and a low of 0.60 (1973, TRM 496.5). SQS values showed the winter phytoplankton assemblage to be similar at all stations excepting TRM 496.5 (1975) and TRM 532.1 (1975 and 1977, appendix 5-A). Similarity indices (SQS) values were also determined for each station by season over the time period of 1973-1985. In nine instances winter SQS values were high enough to consider sample sites similar among years. These were:

Station	Years When SQS > 70 percent	SQS
532.1	1983-1984	72
	1983-1985	81
528.0	1984-1985	73
518.0	1983-1984	79
506.6	1983-1984	76
	1983-1985	71
	1984-1985	71
496.5	1976-1977	72
	1977-1985	76

High incidence of the years 1983, 1984, and 1985 among stations spanning the study area (TRM 496.5 excepted) indicates relative consistency of taxa collected since sampling was reinitiated in spring 1982. No winter sample was collected in 1982. Continued differences at station 4 (TRM 496.5) may be due in part to recruitment from the Hiwassee River, or from local hydrodynamic changes in Chickamauga Reservoir. Reasons for phytoplankton anomalies at TRM 496.5 are not known, although they have generally persisted throughout the sample years and have been documented. Winter percentage similarity (PS) values between stations within years were generally consistent with SQS indices, but showed TRM 496.5 (1974, 1975, 1976, 1984) and/or TRM 532.1 (1975, 1977) to have less than 70 percent similarity (appendix 5-B).

Regression analyses performed on phytoplankton densities at 1.0 meter depth for combined WBN and SQN stations indicated significant polynomial regressions for 1974, 1977, and 1984; however no pattern of abundance was established (appendix 5-E). In 1974 the highest predicted abundance was between TRM's 496.5 and 532.1; in 1977 the lowest predicted number was at the same location; whereas, in 1984, the prediction was linear with an increase in numbers from station 1 (TRM 478.2) through station 10 (TRM 532.1) (appendix 5-E, figure 5-16). These patterns suggest that some factor other than sample site is the primary influence on abundance during the winter season.

Primary production was generally low (range 8 (1976) to 433 (1984) mg C/m^2/day) during winter samples and was not statistically distinguishable from autumn based on main ANOVA effects (table 5-5, comparison III). However when we examine interactions among seasons within stations (i.e., station effect is neutralized) winter was different from autumn (table 5-5, comparison VI), and that except for station 5 (TRM 506.5) ANOVA showed consistent year to year differences in winter phytoplankton production at the sample sites (table 5-5, comparison VIII). Lowest production occurred in 1976 (station 4) with median winter quantities of phytosynthetically bound carbon (derived from appendix 5-G) less than 90 mg C/m^2/day.

Spring--Water velocities were near normal (about 26,000 cfs) during 1973, 1974, 1975, and 1977 and above average (≈ 42,000 cfs) in 1983 and 1984 during spring. Flows were generally lower than average in 1976 and very low in the spring of 1982 and 1985 (average flow 7,100 cfs, range 3,100 - 9,300 cfs). Travel times were slower in spring than in winter, ranging between 2.33 days (1983) and 15.2 days (1985) to traverse the river from TRM 532.1 to TRM 496.5 (appendix 2-A). The relatively long travel times coupled with spring runoff from upstream and from tributary rivers should promote phytoplankton growth in the system.

Phytoplankton densities in spring varied, ranging from 0.13 x 10^6 cells/liter at TRM 506.6 (1976) to 5.89 x 10^6 cells/liter at TRM 532.1 (1983). Although spring phytoplankton densities were generally higher in 1985 (figure 5-17) than when flow was well below normal this trend was not repeated in the low flow conditions of 1982 (figure 5-14). Conversely highest densities as reported above (TRM 532.1) occurred when river velocities were greater than 47,000 cfs (figure 5-15, appendix 2-A).

Year-to-year dominance by Chrysophyta was evident during the first series of preoperational samples (1973-1977) and as was the case during the winter season the dominant taxon was Melosira (appendix 5-D) however the community pattern was changing. Figure 5-3 shows that the middle stations (TRM 518.0 to TRM 529.5) are relatively consistent with respect to composition. TRM's 496.5 and 532.1 show some increase in Cyanophyta (Oscillatoria and Dactylococcopsis were second and third in dominance) and while still relatively few in numbers the minor groups (especially Euglenophyta and Cryptophyta) comprised almost 10 percent of the assemblage particularly in 1982 and 1983 (table 5-2, figures 5-14, and 5-15).

Diversity index values were generally low (range 1.02 to 2.76) during the first years of sampling (1973-1975), improving slightly (1.39 - 3.51) in 1976 and 1977, and showing greater fluctuation but with higher diversities in the 1982-1985 series. Spring densities in the 1980's samples ranged between 0.67 (TRM 527.4, 1984) and 3.95 (TRM 506.6, 1985). Diversity indices tended to correlate directly with the number of taxa collected each year (appendix 5-C) but not with taxa collected at each station. The lowest and highest number of taxa at a single station respectively occurred in 1976 (4) and 1985 (50).

Similarity indices (SQS and PS) showed several patterns of taxonomic complexity. SQS values showed all stations similar (SQS $\geq$ 70 percent) during 1973 and 1985, and the middle stations (TRM's 518.0, 527.4, and 528.0) resembled each other taxonomically during spring samples of other years (appendix 5-A). During 1976, 1977, 1982, and 1984, TRM 496.5 SQS values were less than 70 percent suggesting recruitment of rare taxa from upstream in the Tennessee River and/or from the Hiwassee River. During the entire series of spring samples, SQS and P.S. indices showed the two downstream stations to be similar to each other but quite different from other areas (appendices 5-A and 5-B). These analyses also showed TRM 532.1 (Watts Bar forebay) to be unique with respect to incidence and numbers of rarer phytoplankton forms. SQS indices are usually prepared to test seasonal similarities between stations within a particular year, however the WBN phytoplankton taxa were also analyzed where different years at the same station were seasonally addressed. These analyses showed only four of 252 comparisons with SQS similarities greater than 70 percent between years at a specific station. TRM 529.5 showed 70 percent similarity between 1973 and 1974. TRM 527.4 had SQS of > 70 percent between 1975 and 1976 and between 1976 and 1977. Also at TRM 496.5 the 1977 spring sample was similar to the 1985 sample. The limited number of similarities indicates that while the system is generally similar within a specific year, taxonomic variability during spring is quite apparent when compared among years.

Regression analyses performed on combined WBN and SQN phytoplankton abundance data showed two spring periods (1976 and 1977) when polynomial regressions were not significant. The several significant regressions (appendix 5-G) and their respective graphic forms can be interpreted as segments of polynomial form with nadirs near TRM 496.5 or TRM 506.6 and highs at or near Chickamauga and Watts Bar forebays. During periods of average flow (1973, 1974, 1975, 1984) we document the "normal" form of the curve, however as flows increase the nadir is pushed downstream and the spring curve approaches linear and directly related to river mile. During periods of continued low flow (1985) phytoplankton production increased at the more downstream stations (i.e., this inflection point of the curve moves upstream), consequently the spring production curve become more linear and inversely related to river mile.

Primary production was quite variable during spring ranging from 0.6 $mgC/m^2/day$ in 1975 to 786 $mgC/m^2/day$ in 1985. Overall, 1975 data were consistently very low (0.6 to 2.1 $mgC/m^2/day$) suggesting few organisms were capable of reproducing during the test series. These values were well below others observed during preoperational monitoring of phytoplankton production, and were not included in the multiple ANOVA of phytoplankton primary production (table 5-5). Interactions among stations within season showed TRM 496.5 and TRM 532.1 had significantly greater primary production than intermediate sites (table 5-5, comparison VI) and the year 1977 was the most productive during spring (table 5-5, comparison VIII).

Summer--Summer flows are usually greater than other seasons and averaged more than 29,000 cfs in the vicinity of WBN. This flow plus or minus 5,000 cfs was present during all sample years except 1977 (average flow 20,800 cfs) and 1985 (average flow 21,700 cfs). Water travel times were generally greater than spring values ranging between 2.9 days (1982) and 4.1 days (1985) for a water mass to move from TRM 532.1 to TRM 496.5 (appendix 2-A). The relatively consistent flows, travel times and water temperatures (range 24.5C to 28.5C) provided conditions conducive to phytoplankton growth and reproduction.

Summer phytoplankton densities varied with respect total numbers ranging from 0.16 x 10^6 cells/liter at TRM 506.5 (1974) to 24.93 x 10^6 cells/liter at TRM 532.1 (1982) (figures 5-10 and 5-14). Only once during the entire study were summer phytoplankton densities surpassed by another season's abundance. This occurred in 1974 when the spring assemblage was more numerous than summer (figure 5-10).

While Chrysophyta generally dominated the winter and spring assemblages, summer phytoplankton were dominated by Cyanophyta (figure 5-4). However, in table 5-2 we see that Cyanophyta did not begin to dominate the system until summer of 1976. Prior to 1976 the Cyanophytes surpassed 40 percent of total abundance twice (TRM 518.0 (45 percent) and TRM 528.0 (49 percent) in 1975), however beginning in 1976 the Cyanophyta comprised from 56 percent (TRM 496.5, 1985) to 91 percent

(TRM 532.1, 1982) of each summer sample. During 1973, Chrysophyta dominated at TRM's 518.0 through TRM 532.1 (Synedra) and TRM 496.5 (Melosira) with Scenedesmus, a chlorophyte, dominant at TRM 506.5. Summer of 1974 was similar to other seasons with Melosira dominating the assemblage at most stations (appendix 5-D). Melosira was dominant only once more among summer samples (TRM 529.5, 1975), as the system shifted toward more eutrophic forms (Cyanophyta) in later years. During the period 1975-1985 summer phytoplankton samples were comprised primarily of Anacystis during earlier years (1975-1977) supplemented by several other Cyanophyta (Merismopedia, Oscillatoria, and Raphidiopsis) at one or more stations during 1982-1985 (appendix 5-D).

Diversity index values were higher during summer than any other season, ranging from 1.03 (TRM 532.1, 1982) to 4.40 (TRM 496.5, 1985) (appendix 5-C). Earlier sampling (1973-1977) showed more consistency of d bar values ranging between 1.73 (1974) and 4.21 (1977), with both values determined at the same location (TRM 527.4). Numbers of taxa reported at each station during summer were greater than any other season, ranging from 17 at TRM 518.0 (1974) to 62 also at TRM 518.0 (1977) (appendix 5-D).

Similarity indices showed the summer assemblage to be relatively consistent taxonomically. SQS values showed all stations to be similar during all years except 1979 (appendix 5-A). The reason for low (< 70 percent) values for this year is unknown. In 1979 only four of 21 comparisons were SQS $\geq$ 70 percent, a trend which was repeated by percentage similarity (PS) analyses (appendix 5-B). Throughout the summer season PS values showed TRM's 496.5 and 506.5 resembled each other but were different from other stations during 1973, 1975, 1982, 1983, 1984, and 1985. TRM 532.1 was taxonomically unique during several years (1974, 1975, 1982, 1983, and 1985) (appendix 5-B). No distinct pattern of similarity was evident among the other WBN stations. SQS analyses testing seasonal similarities among years at a specific station showed 30 percent of summer comparisons to be similar at $\geq$ 70 percent level. This relatively high incidence of year-to-year similarity, the next highest season was winter with 3.6 percent of comparisons being similar, documents long-term constancy within phytoplankton taxa living in this reach of the Tennessee River.

As was the case for spring, summer phytoplankton abundance regressions were significant for all years except 1976 and 1977 (appendix 5-E). However, because summer travel times were much shorter than those of spring (appendix 2-A), the relationship between river flow and inflection points of the second-order polynomial equations was less apparent (appendix 5-E). In most years (1974 and 1985, excepted) predicted values showed higher abundances in the Watts Bar and Chickamauga forebay areas and lows in the vicinity of TRM 496.5 - TRM 506.6. In 1984 and 1985 with water mass travel times of 3.2 and 4.1 days, respectively, the regressions were almost linear and directly related to river mile.

Summer primary production was more variable than spring, ranging between 14 mgC/m^2/day in 1975 (TRM 506.5) and 78674 mgC/m^2/day in 1985 (TRM 527.4). Overall, 1985 data were consistently greater (11,789 to 78,694 $mgC/m^2/day$) than generally observed (appendix 5-G). Median daily carbon assimilation rates during summer (all years) was 279 $mgC/m^2/day$. In all cases where analyses of variance tests were performed, main effects analysis showed summer to be significantly more productive than the other seasons. Interactions among seasons within stations (table 5-5, comparison VI), among seasons over years (table 5-5, comparison VIII) and among seasons by depth (table 5-5, comparison X) showed summer to be about three times as productive as the other seasons when station and year effects were neutralized. However neutralization of years and stations showed depth to have no significant proportional effect on seasonal photosynthesis.

Autumn--Water flows in the Tennessee River during November ranged between 20,000 and 25,000 cfs with an average travel time of 2.9 days to traverse the river from TRM 532.1 to TRM 496.5 (chapter 2 and appendix 2-A). Other than surface elevation changes (decrease in elevation to winter pool levels commences around 1 October and continues to the end of December) autumn hydrologic conditions were relatively consistent. Low average flow conditions during or just prior to sampling occurred in 1985 (16,700 cfs), longest travel time was 4.0 days in 1983, and autumn temperatures ranged between 15C and 16C (appendix 2-A).

Phytoplankton densities in autumn were less than at any other season and varied with respect to dominant forms (figures 5-5 and appendix 5-D). Overall the percentage composition by group (years combined) seemed to be balanced with Chrysophyta being the prevalent group (figure 5-5). However, table 5-2 shows that, as was the case in summer, the community has changed through time with other groups dominating the assemblage. During 1973, 1974, 1975 excepting TRM 506.5 and 1976 excepting TRM 496.5, Chrysophyta (Melosira) continued as the most numerous form at most sites. Anacystis (Cyanophyta) dominated at TRM 496.5 and TRM 506.6 in 1975 and 1976 (table 5-2, and appendix 5-D). In 1977, Anacystis dominated the samples at TRM's 506.5, 518.0, and 527.4. When sampling was resumed in 1982 the numerical distribution of phytoplankton had changed. Along with Melosira and Anacystis were Cryptophyta (Chroomonas at TRM 496.5 in 1982), Oscillatoria (Cyanophyta) at TRM 506.5 (1983) and TRM's 527.4 through 532.1 (1985), as well as Scenedesmus and Cyclotella representing Chlorophyta as dominants throughout the river reach (appendix 5-D). While the assemblage was taxonomically diverse it was numerically sparse with densities ranging between fewer than 0.07 x 10^6 cells/liter (TRM 496.5, 1983 and TRM 506.5, 1984) and a high of 1.80 x 10^6 cells/liter at TRM 528.0 in 1977 (see figures 5-15, 5-16, and 5-13, respectively).

Diversity index values were generally lower in autumn than in summer ranging between 1.02 (TRM 506.6, 1974 and 1976) and 3.37 (TRM 496.5, 1982), however, they improved slightly during 1982-1985 (appendix 5-C). Number of taxa at any single station ranged from 9 in 1974 and 1984 to 42 in 1982 (appendix 5-D). Percent similarity (PS) indices showed the downstream stations (TRM's 496.5 and 506.5) to resemble each other during the autumn of 1973, 1974, 1975, 1984, and 1985 but were different from any other station during those years. In 1982, PS showed similarity between adjacent stations but with an upstream

(TRM 532.1) to downstream trend toward differences (appendix 5-B). In 1976 and 1983 no distinct pattern of percent similarity values was discernable. SQS values showed all stations to be similar (SQS $\geq$ 70 percent) during 1982 and 1985, and with only minor exceptions in 1977. No distinct SQS pattern was evident in 1983 and 1984 (appendix 5-A). During 1973, 1974, 1975, and 1976, autumn SQS indices showed TRM's 496.5 and 506.5 to be different from TRM's 518.0 - 532.1, which were generally similar to each other. This same pattern occurred during summer and for TRM 496.5 during winter and spring seasons also (appendix 5-A). Autumn SQS indices of taxonomic similarity over years showed only one of 252 comparisons (1975-1976 at TRM 528.0) had a similarity index $\geq$ 70 percent. This reiterates what was observed during spring and to some extent winter; that while taxonomic homogeneity within years is demonstrated, taxonomic heterogeneity between years also exists and must be considered when evaluating phytoplankton community changes in the vicinity of WBN.

November phytoplankton abundance regressions were significant for all years except 1975 and 1985 (appendix 5-E). However with the possible exception of 1983 (which had the longest travel time (4 + days) of autumn samples) no regressions indicate recovery of autumn phytoplankton numbers to levels observed in Watts Bar forebay. Fitted abundance curves for autumn phytoplankton were more linear (first-order polynomial) than parabolic (second-order polynomial) and were directly related to river mile (appendix 5-E).

Autumn primary production was generally low (median 104 $mgC/m^2/day$, range 2 to 1562 $mgC/m^2/day$) and was not statistically distinguishable from winter based on main ANOVA effects (table 5-5, comparison III). However, when interactions among seasons within stations were examined (i.e. station effect is neutralized) autumn was observed to be more variable than winter (table 5-5, comparison VI) and for several stations (TRM 496.5, TRM 518.0, and TRM 529.5) to have the lowest phytoplankton production.

5.2.2 Phytoplankton Summary and Conclusions

Seasonal preoperational phytoplankton parameters (community structure, abundance, biomass, and productivity) indicate a distribution which varies considerably from year to year, but is primarily controlled by the continuously mixed flow pattern of the Tennessee River in the vicinity of WBN. Although the potential for primary production was demonstrated by carbon-14 assimilation studies at all stations during all seasons, in situ growth and reproduction was sparse because turbulent flow in the study reach prevented phytoplankton obtaining enough energy (light) to photosynthesize. Turbulent flow begins to decrease just downstream from the lower most WBN station, consequently production increases as the water mass approaches the forebay area near Chickamauga Dam.

Chlorophyll a concentrations during preoperational monitoring were usually lowest in the autumn and highest in summer with considerable year to year variations. Phytoplankton biomass values were generally greatest in Watts Bar forebay (TRM 532.1) with a shallow downward trend to TRM 496.5 and then increased toward Chickamauga Dam (TVA 1984).

The abundance investigations indicated a tendency toward increases in phytoplankton numbers through time in the vicinity of WBN. This increase in numbers along with the change in community dominance (shift from chrysophyte dominated system to a cyanophyte dominated one) needs to be tracked in the future. The shift of the phytoplankton assemblage toward a less preferred community seems to be originating in the Watts Bar forebay area, however it has potential to effect interpretation of WBN operational activities.

Table 5-1. Phytoplankton Genera Collected During Preoperational Monitoring at Watts Bar Nuclear Plant, 1973-1985

Phytoplankton Genera		
	CHLOROPHYTA	
Acanthosphaera	Dictyosphaerium	Polyedriopsis
Actinastrum	Echinosphaerella	Protococcus
Ankistrodesmus	Elakatothrix	Pteromonas
Arthrodesmus	Euastrum	Pyramimonas
Botryococcus	Eudorina	Quadrigula
Bracteacoccus	Franceia	Scenedesmus
Carteria	Gloeoactinium	Schroederia
Characium	Gloeocystis	Selenastrum
Chlamydomonas	Gloenkinia	Spermatozoopsis
Chlorella	Gonium	Sphaerocystis
Chlorococcum	Hyalotheca	Spirogyra
Chlorogonium	Kirchneriella	Spondylosium
Chodatella	Micractinium	Staurastrum
Cladophora	Micrasterias	Stigeoclonium
Closteridium	Mougeotia	Tetradesmus
Closteriopsis	Oocystis	Tetraedron
Closterium	Pandorina	Tetraspora
Coelastrum	Pediastrum	Tetastrum
Cosmarium	Planktosphaeria	Treubaria
Crucigenia	Platydorina	Trochiscia
Dactylococcus	Pleodorina	Ulothrix
	CHRYSOPHYTA	
Achnanthes	Dichotomococcus	Nitzschia
Asterionella	Dinobryon	Ophiocytium
Attheya	Eunotia	Pinnularia
Caloneis	Fragilaria	Pleurosigma
Chaetoceros	Gomphonema	Rhizosolenia
Cocconeis	Gyrosigma	Rhoicosphenia
Cyclotella	Mallomonas	Stephanodiscus
Cymatopleura	Melosira	Surirella
Cymbella	Meridion	Synedra
Diatoma	Navicula	Synura
		Tabellaria
	CRYPTOPHYTA	
Chroomonas	Cryptomonas	

Table 5-1. (Continued)

Phytoplankton Genera		
	CYANOPHYTA	
Anabaena	*Calothrix*	*Gomphosphaeria*
Anabaenopsis	*Chroococcus*	*Lyngbya*
Anacystis	*Coelosphaerium*	*Merismopedia*
Aphanizomenon	*Cylindrospermum*	*Microcystis*
Aphanocapsa	*Dactylococcopsis*	*Oscillatoria*
Aphanothece	*Eucapsis*	*Phormidium*
	Gloeothece	*Raphidiopsis*
	EUGLENOPHYTA	
Cryptoglena	*Phacus*	*Trachelomonas*
Euglena		
	PYRROPHYTA	
Ceratium	*Gymnodinium*	*Peridinium*
Glenodinium		

Table 5-2. Percentage Composition of Phytoplankton Groups During Preoperational Monitoring (1973-1985), Watts Bar Nuclear Plant

Date	Phytoplankton Group	Tennessee River Mile						
		496.5	506.5	518.0	527.4	528.0	529.5	532.1
March 1973	Chlorophyta	1	24	18	9	7	12	1
	Chrysophyta	96	78	77	84	90	83	94
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	3	5	5	6	3	5	5
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
May 1973	Chlorophyta	15	13	14	5	10	9	21
	Chrysophyta	80	84	81	93	88	89	76
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	5	3	5	2	2	2	3
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
August 1973	Chlorophyta	47	50	43	38	37	35	37
	Chrysophyta	39	23	29	31	28	28	29
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	14	26	27	29	31	37	32
	Euglenophyta	0	0	0	2	0	0	2
	Pyrrophyta	0	0	0	0	0	0	0
November 1973	Chlorophyta	32	32	30	36	34	30	31
	Chrysophyta	62	59	63	59	61	59	60
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	3	6	6	3	3	7	5
	Euglenophyta	3	3	0	2	2	4	4
	Pyrrophyta	0	0	0	0	0	0	0

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
February 1974	Chlorophyta	27	24	19	11	10	20	23
	Chrysophyta	65	66	73	81	81	73	70
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	1	5	2	4	5	5	5
	Euglenophyta	3	2	5	2	3	2	0
	Pyrrophyta	4	3	2	1	2	0	3
May 1974	Chlorophyta	39	19	13	14	15	15	17
	Chrysophyta	55	78	79	83	80	81	82
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	5	3	8	3	4	3	2
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
August 1974	Chlorophyta	38	38	43	43	39	29	34
	Chrysophyta	49	50	56	55	61	70	63
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	11	5	1	1	0	1	1
	Euglenophyta	2	2	0	0	0	0	0
	Pyrrophyta	0	5	0	0	0	0	0
November 1974	Chlorophyta	26	17	21	22	21	16	17
	Chrysophyta	69	80	74	72	76	77	76
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	3	2	5	4	3	5	5
	Euglenophyta	2	0	0	1	0	2	2
	Pyrrophyta	0	0	0	0	0	0	0

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
February 1975	Chlorophyta	77	34	48	54	53	58	61
	Chrysophyta	14	46	29	23	24	20	18
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	4	15	9	12	12	7	7
	Euglenophyta	4	4	14	11	11	15	14
	Pyrrophyta	0	1	1	1	0	0	0
May 1975	Chlorophyta	19	11	7	11	11	10	14
	Chrysophyta	72	74	76	77	66	68	79
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	9	16	17	12	23	22	5
	Euglenophyta	0	0	0	0	0	0	2
	Pyrrophyta	0	0	0	0	0	0	0
August 1975	Chlorophyta	39	50	41	39	33	44	44
	Chrysophyta	26	23	13	32	18	29	23
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	34	27	45	27	49	25	32
	Euglenophyta	0	0	0	0	0	2	0
	Pyrrophyta	0	0	0	0	0	0	0
November 1975	Chlorophyta	49	26	37	40	32	44	47
	Chrysophyta	37	22	33	40	40	46	30
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	12	53	29	17	24	6	18
	Euglenophyta	2	0	0	3	3	3	4
	Pyrrophyta	0	0	0	0	1	1	1

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
February 1976	Chlorophyta	3	4	4	6	7	4	4
	Chrysophyta	89	89	85	93	89	92	85
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	7	7	11	1	5	4	10
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
May 1976	Chlorophyta	28	30	6	17	24	26	23
	Chrysophyta	37	46	91	73	70	73	75
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	35	22	4	10	6	1	1
	Euglenophyta	0	2	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
August 1976	Chlorophyta	12	20	14	16	15	14	10
	Chrysophyta	5	8	9	10	10	12	8
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	82	72	77	74	75	75	82
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
November 1976	Chlorophyta	24	5	9	8	13	18	21
	Chrysophyta	26	90	80	83	54	75	66
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	50	4	11	8	33	6	13
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
February 1977	Chlorophyta	13	31	25	19	19	19	30
	Chrysophyta	82	65	69	74	75	76	59
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	3	4	6	6	5	4	11
	Euglenophyta	2	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
May 1977	Chlorophyta	34	7	5	3	4	5	9
	Chrysophyta	50	86	88	90	86	84	82
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	15	6	6	6	9	10	9
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
August 1977	Chlorophyta	25	21	16	19	19	22	23
	Chrysophyta	8	7	4	6	6	7	7
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	67	72	79	75	74	71	70
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
November 1977	Chlorophyta	44	30	26	17	20	31	29
	Chrysophyta	39	55	45	25	31	3	33
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	14	14	28	57	48	63	31
	Euglenophyta	0	0	0	0	0	3	6
	Pyrrophyta	0	0	0	0	0	0	1

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
May 1982	Chlorophyta	11	8	11	9	14	8	15
	Chrysophyta	10	11	14	30	42	43	21
	Cryptophyta	43	70	53	37	28	36	43
	Cyanophyta	36	10	22	23	16	13	21
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
August 1982	Chlorophyta	19	27	20	10	10	10	5
	Chrysophyta	12	13	11	7	7	7	3
	Cryptophyta	1	1	1	0	1	0	0
	Cyanophyta	68	60	68	83	83	82	91
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
November 1982	Chlorophyta	20	21	21	18	19	22	14
	Chrysophyta	52	44	43	42	43	38	42
	Cryptophyta	22	14	14	16	17	12	14
	Cyanophyta	5	21	20	23	19	28	29
	Euglenophyta	1	1	1	1	1	1	1
	Pyrrophyta	0	0	0	0	0	0	0
February 1983	Chlorophyta	9	8	7	9	10	9	12
	Chrysophyta	70	57	66	68	64	71	52
	Cryptophyta	2	3	3	4	2	2	2
	Cyanophyta	18	31	23	18	23	17	32
	Euglenophyta	1	1	1	1	1	1	1
	Pyrrophyta	1	0	0	0	0	0	1

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
May 1983	Chlorophyta	6	6	8	6	7	7	8
	Chrysophyta	30	38	50	52	48	47	41
	Cryptophyta	39	5	3	3	4	4	2
	Cyanophyta	23	50	38	38	41	41	48
	Euglenophyta	1	1	0	0	0	0	1
	Pyrrophyta	1	1	0	0	0	0	0
August 1983	Chlorophyta	28	23	16	14	13	15	8
	Chrysophyta	11	9	9	8	7	10	4
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	59	66	74	78	79	74	87
	Euglenophyta	1	1	0	0	0	1	0
	Pyrrophyta	1	1	0	0	0	1	1
November 1983	Chlorophyta	52	37	37	26	31	25	42
	Chrysophyta	23	31	51	38	57	34	40
	Cryptophyta	21	7	8	6	8	7	13
	Cyanophyta	0	22	0	28	0	33	0
	Euglenophyta	4	3	3	1	3	2	4
	Pyrrophyta	0	0	0	1	1	0	0
February 1984	Chlorophyta	16	14	14	14	15	20	20
	Chrysophyta	69	56	62	66	68	72	66
	Cryptophyta	5	3	3	5	6	5	7
	Cyanophyta	9	25	20	13	10	0	3
	Euglenophyta	1	1	1	1	2	3	3
	Pyrrophyta	0	0	0	0	0	0	0

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
May 1984	Chlorophyta	22	7	13	6	3	4	7
	Chrysophyta	68	80	83	92	96	94	78
	Cryptophyta	0	0	0	1	0	0	1
	Cyanophyta	10	12	4	0	0	0	13
	Euglenophyta	0	1	0	1	1	1	1
	Pyrrophyta	0	0	0	0	0	0	0
August 1984	Chlorophyta	27	27	15	9	11	13	14
	Chrysophyta	9	6	6	7	6	7	8
	Cryptophyta	1	1	1	0	1	1	1
	Cyanophyta	64	66	77	83	82	78	77
	Euglenophyta	0	0	0	0	0	0	0
	Pyrrophyta	0	0	0	0	0	0	0
November 1984	Chlorophyta	32	43	71	42	40	50	53
	Chrysophyta	42	38	15	44	35	38	39
	Cryptophyta	1	2	0	1	1	1	1
	Cyanophyta	22	14	12	13	22	6	3
	Euglenophyta	3	2	1	1	2	4	3
	Pyrrophyta	0	0	0	0	0	1	0
February 1985	Chlorophyta	19	13	13	10	11	11	15
	Chrysophyta	54	53	56	51	45	47	47
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	25	32	29	38	44	42	37
	Euglenophyta	2	1	2	1	1	0	1
	Pyrrophyta	0	0	0	0	0	0	0

Table 5-2. (Continued)

Date	Phytoplankton Group	Tennessee River Mile 496.5	506.5	518.0	527.4	528.0	529.5	532.1
May 1985	Chlorophyta	27	24	21	14	14	12	7
	Chrysophyta	27	41	44	52	48	53	46
	Cryptophyta	0	2	1	1	1	1	0
	Cyanophyta	44	32	32	32	35	32	45
	Euglenophyta	1	1	1	1	1	1	1
	Pyrrophyta	0	0	0	0	1	1	0
August 1985	Chlorophyta	27	21	22	21	22	17	21
	Chrysophyta	14	11	12	11	12	10	8
	Cryptophyta	2	1	1	1	0	0	0
	Cyanophyta	56	67	64	67	65	72	69
	Euglenophyta	1	1	0	1	1	1	1
	Pyrrophyta	1	0	0	0	0	0	1
November 1985	Chlorophyta	16	21	27	45	42	45	37
	Chrysophyta	14	18	15	24	27	22	27
	Cryptophyta	0	0	0	0	0	0	0
	Cyanophyta	68	59	56	30	30	32	34
	Euglenophyta	2	2	1	1	1	1	1
	Pyrrophyta	1	0	0	0	0	0	0

Table 5-3. Results of Statistical Analysis (Four-Way ANOVA and SNK Multiple Range Test of Data Sets with Significant F-Ratios) on Phytoplankton Preoperational Abundance Data (Log Transformed) Watts Bar Nuclear Plant, 1973-1985

Variance Square	Degree of Freedom	Sum of Squares	F-Value	Probability > F
River Mile (RM)	6	144.06	5.58	0.0001*
Year	7	670.40	22.27	0.0001*
Depth	3	24.76	1.92	0.1243
Quarter	3	959.07	74.33	< 0.0001*
RM x Year	42	180.98	1.00	0.4680
RM x Depth	18	28.04	0.36	0.9935
Rm x Quarter	18	94.30	1.22	0.2361
Year x Depth	21	40.28	0.45	0.9859
Year x Quarter	21	949.19	10.51	0.0001**
Depth x Quarter	9	11.54	0.30	0.9755
RM x Year x Depth	126	144.66	0.27	1.0000
Rm x Depth x Quarter	54	54.10	0.23	1.0000
RM x Year x Quarter	126	448.77	0.83	0.9175
RM x Year x Depth x Quarter	441	651.60	0.34	1.0000

SNK Multiple Range Tests of Significant Four-Way F-Ratios

	SNK							
	Low Mean						High Mean	
River Mile df = 3584	5	4	6	9	8	7	10	
Year df = 3584	74	73	76	75	84	77	83	85
Quarter df = 3584	Fall	Spring	Winter	Summer				

*Significant main effect, subjected to SNK.
** Significant interaction (secondary effect) discussed in body of report.

SNK Multiple Range Test: Means ranked lowest to highest using station numbers; means not underscored by the same line are significantly different at α = 0.05.

Station 4 = Tennessee River Mile 496.5
" 5 = " " " 506.6
" 6 = " " " 518.0
" 7 = " " " 527.4
" 8 = " " " 528.0
" 9 = " " " 529.5
" 10 = " " " 532.1

Table 5-4. Results of Four-Way Analysis of Variance for Phytoplankton Production in the Vicinity of Watts Bar Nuclear Plant

Variation Source	Degrees of Freedom	SS	F	PR > F
River Mile (R)	6	4240.27	11.93	0.0001
Year (Y)	4	3750.01	15.79	0.0001
Month (M)	3	7843.72	44.05	0.0001
Depth (D)	3	19646.18	110.32	0.0001
R x Y	24	3538.56	2.48	0.0001
R x M	18	2933.76	2.75	0.0001
R x D	18	2848.42	2.67	0.0001
Y x M	12	4898.65	6.88	0.0001
Y x D	12	3808.94	5.35	0.0001
M x D	9	5040.21	9.43	0.0001
R x Y x M	72	6225.01	4.04	0.0001
R x Y x D	72	2342.89	1.52	0.0113
R x M x D	54	2027.13	1.76	0.0026
Y x M x D	36	3296.18	4.28	0.0001
R x Y x M x D	216	4619.61		

Table 5-5. Summary of ANOVA for Primary Productivity for Watts Bar Biological Investigations. Least Significant Differences (LSD) Indicated if F was Significant (PR > F $\geq$ 0.001)

Comparison	Primary Productivity	99 Percent LSD
I. River Mile (R) (n = 80)		
496.5 (R1)	5.20a*	
506.5 (R2)	4.15a	
518.0 (R3)	6.31ab	
527.4 (R4)	11.17cd	
528.0 (R5)	8.70bc	
529.5 (R6)	7.21ab	
532.1 (R7)	12.08d	
		3.14
II. Year (Y) (n = 112)		
1973 (Y1)	9.95cd	
1974 (Y2)	4.09a	
1976 (Y3)	7.39bc	
1977 (Y4)	11.38d	
1983 (Y5)	6.35ab	
		2.65
III. Month (M) (n = 140)		
February (M1)	4.95a	
May (M2)	8.26b	
August (M3)	13.78c	
November (M4)	4.34a	
		2.37
IV. Depth (D) (n = 140)		
0.3M (D1)	15.56c	
1.0M (D2)	11.54b	
3.0M (D3)	2.91a	
5.0M (D4)	1.31a	
		2.37

Table 5-5. (Continued)

Comparison	Primary Productivity	99 Percent LSD
V. R x Y (n = 16)		
R1Y1	3.98a	
R1Y2	3.29a	
R1Y3	4.71a	
R1Y4	8.11a	
R1Y5	5.89a	
R2Y1	4.17a	
R2Y2	1.40a	
R2Y3	4.92a	
R2Y4	4.60a	
R2Y5	5.68a	
R3Y1	8.47a	
R3Y2	2.92a	
R3Y3	6.56a	
R3Y4	6.14a	
R3Y5	7.46a	
R4Y1	12.60b	
R4Y2	4.48a	
R4Y3	8.74ab	
R4R4	16.52c	
R4Y5	13.52bc	
R5Y1	12.57b	
R5Y2	5.04a	
R5Y3	8.61ab	
R5Y4	11.93ab	
R5Y5	5.38a	
R6Y1	10.18a	
R6Y2	3.98a	
R6Y3	7.49a	
R6Y4	10.66a	
R6Y5	3.73a	
R7Y1	17.66cd	
R7Y2	7.50ab	
R7Y3	10.68bc	
R7Y4	21.73d	
R7Y5	2.82a	
		7.02

Table 5-5. (Continued)

Comparison	Primary Productivity	99 Percent LSD
VI. R x M (n = 20)		
R1M1	2.89ab	
R1M2	7.78b	
R1M3	8.97b	
R1M4	1.15a	
R2M1	4.83a	
R2M2	4.29a	
R2M3	6.06	
R2M4	1.43a	
R3M1	5.31ab	
R3M2	5.77ab	
R3M3	10.76b	
R3M4	3.40a	
R4M1	5.86a	
R4M2	9.76a	
R4M3	24.09b	
R4M4	4.98a	
R5M1	5.48a	
R5M2	7.88a	
R5M3	15.63b	
R5M4	5.84a	
R6M1	4.66a	
R6M2	6.30ab	
R6M3	12.35b	
R6M4	5.53a	
R7M1	5.64a	
R7M2	16.05b	
R7M3	18.58b	
R7M4	8.04a	
		6.28
VII. R x D (n = 20)		
R1D1	11.01b	
R1D2	7.18b	
R1D3	1.70a	
R1D4	0.90a	
R2D1	7.60a	

Table 5-5. (Continued)

Comparison	Primary Productivity	99 Percent LSD
VII. R x D (n = 20) (Continued)		
R2D2	5.43a	
R2D3	2.07a	
R2D4	1.52a	
R3D1	12.22b	
R3D2	9.90b	
R3D3	2.26a	
R3D4	0.86a	
R4D1	22.03b	
R4D2	16.84b	
R4D3	4.15a	
R4D4	1.68a	
R5D1	17.93b	
R5D2	12.21b	
R5D3	3.22a	
R5D4	1.46a	
R6D1	14.63b	
R6D2	10.52b	
R6D3	2.53a	
R6D4	1.16a	
R7D1	23.53b	
R7D2	18.74b	
R7D3	4.47a	
R7D4	1.58a	
		6.28
VIII. Y x M (n = 28)		
Y1M1	7.31a	
Y1M2	6.63a	
Y1M3	21.51b	
Y1M4	4.34a	
Y2M1	1.09a	
Y2M2	2.82ab	
Y2M3	7.35b	
Y2M4	5.09ab	
Y3M1	4.87a	
Y3M2	4.53a	

Table 5-5. (Continued)

Comparison	Primary Productivity	99 Percent LSD
VIII. Y x M (n = 28) (Continued)		
Y3M3	14.10b	
Y3M4	6.05a	
Y4M1	9.76b	
Y4M2	15.30c	
Y4M3	17.20c	
Y4M4	3.27a	
Y5M1	1.74a	
Y5M2	12.02b	
Y5M3	8.73b	
Y5M4	2.93a	
		5.30
IX. Y x D (n = 28)		
Y1D1	21.26a	
Y1D2	15.09b	
Y1D3	2.53c	
Y1D4	0.90c	
Y2D1	8.52a	
Y2D2	5.60ab	
Y2D3	1.58bc	
Y2D4	0.64c	
Y3D1	14.01a	
Y3D2	11.63a	
Y3D3	2.88b	
Y3D4	1.03b	
Y4D1	24.38a	
Y4D2	15.61b	
Y4D3	3.50c	
Y4D4	2.04c	
Y5D1	9.64a	
Y5D2	9.79a	
Y5D3	4.08b	
Y5D4	1.91b	
		5.30

Table 5-5. (Continued)

Comparison	Primary Productivity	99 Percent LSD
X. M x D (n = 35)		
M1D1	9.17b	
M1D2	7.41b	
M1D3	1.91a	
M1D4	1.33a	
M2D1	16.10b	
M2D2	11.76b	
M2D3	3.49a	
M2D4	1.70a	
M3D1	27.76c	
M3D2	26.72b	
M3D3	4.95a	
M3D4	1.68a	
M4D1	9.22b	
M4D2	6.29b	
M4D3	1.31a	
M4D4	0.52a	
		4.74

*Values with the same letter are not significantly different from one another.

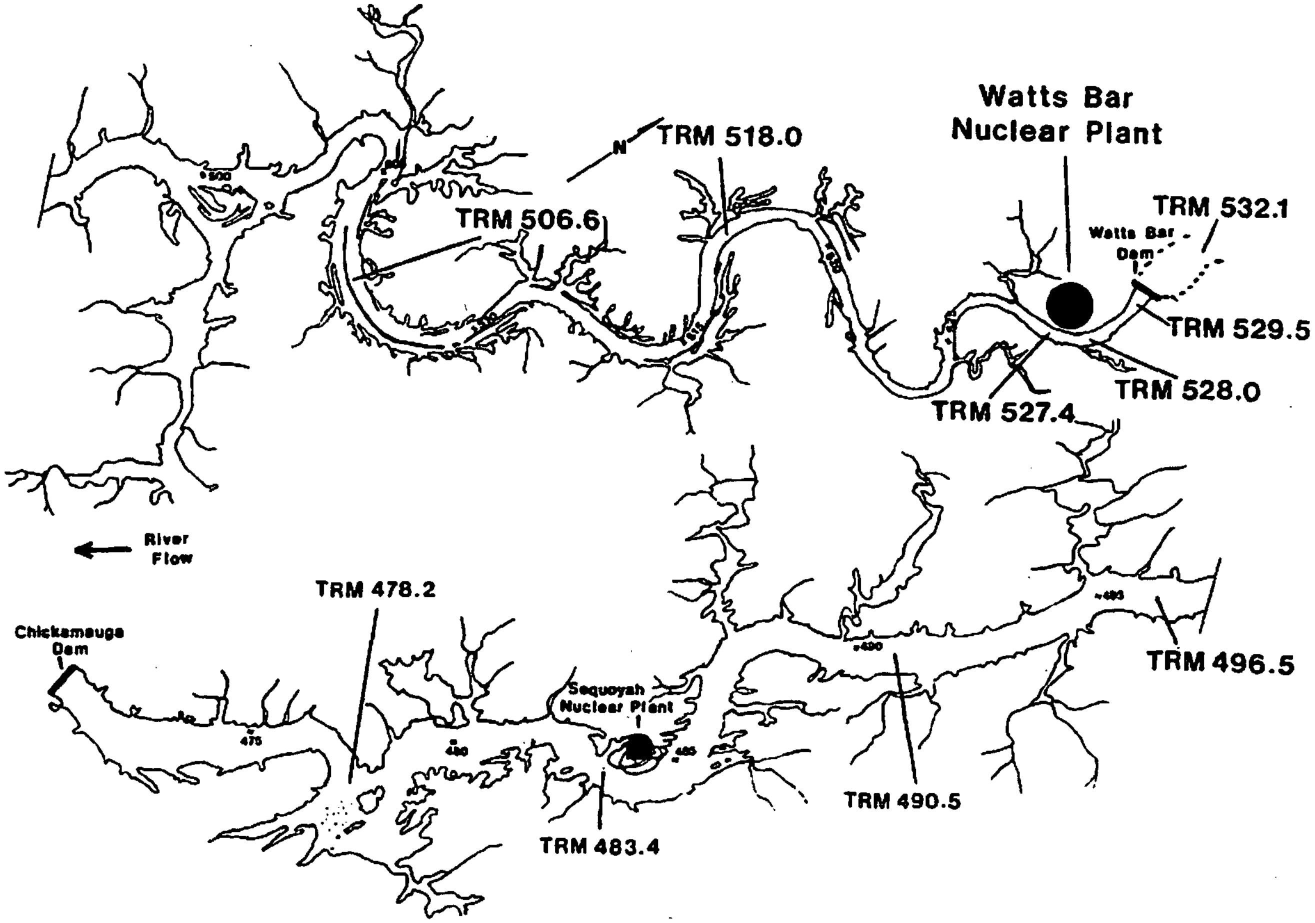


Figure 5-1. Location of Plankton Sample Stations for Watts Bar Nuclear Plant (Larger Sized Print) and Sequoyah Nuclear Plant (Smaller Sized Print) on Chickamauga Reservoir. Two Additional Locations (TRMs 472.8 and 484.5) Were Sampled as Part of Sequoyah Nuclear Plant Monitoring in July 1985.

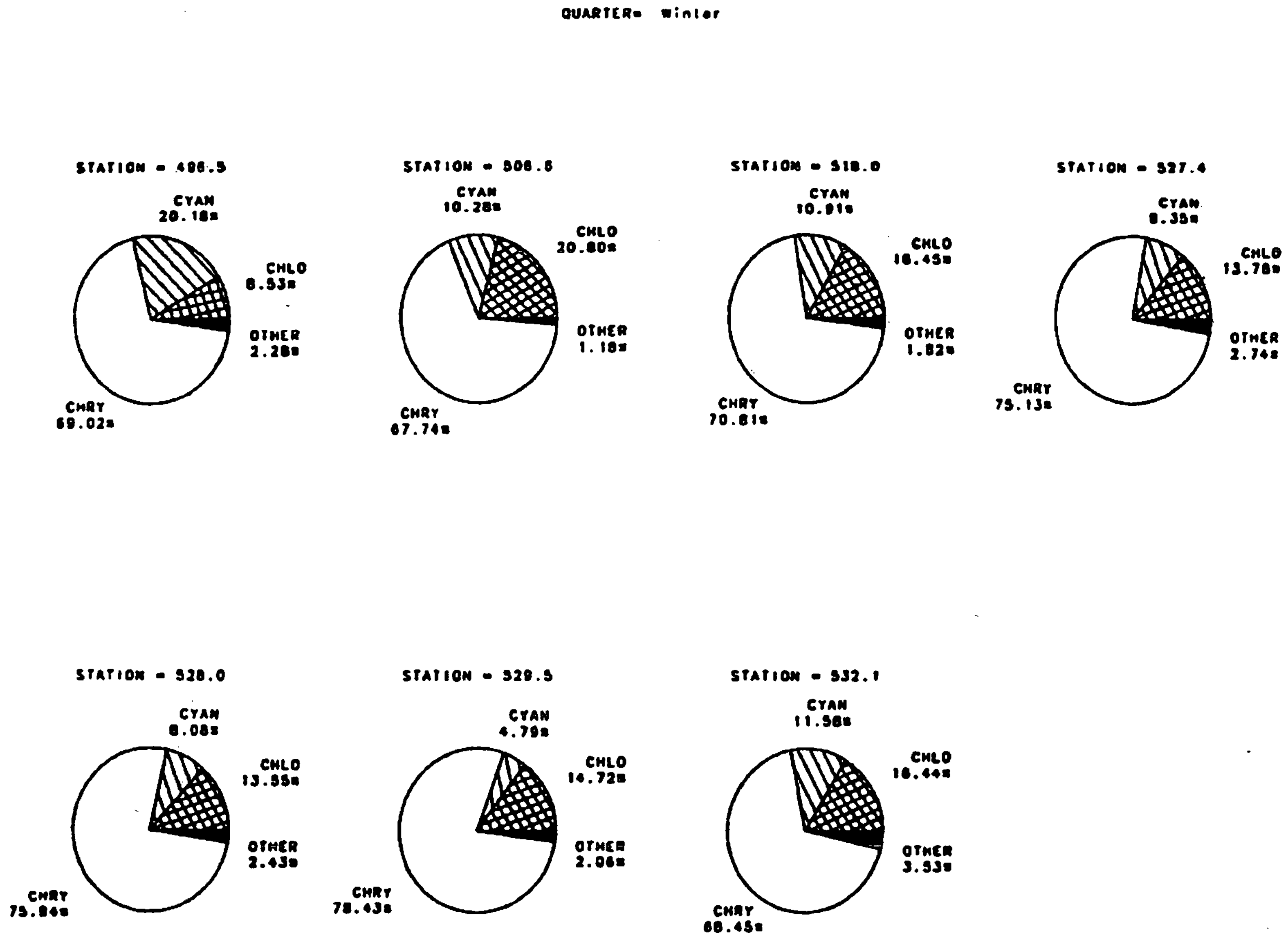


Figure 5-2. Percentage Composition by Major Group (Years Combined) of the Winter Phytoplankton Assemblage in the Vicinity of Watts Bar Nuclear Plant, 1973-1985.

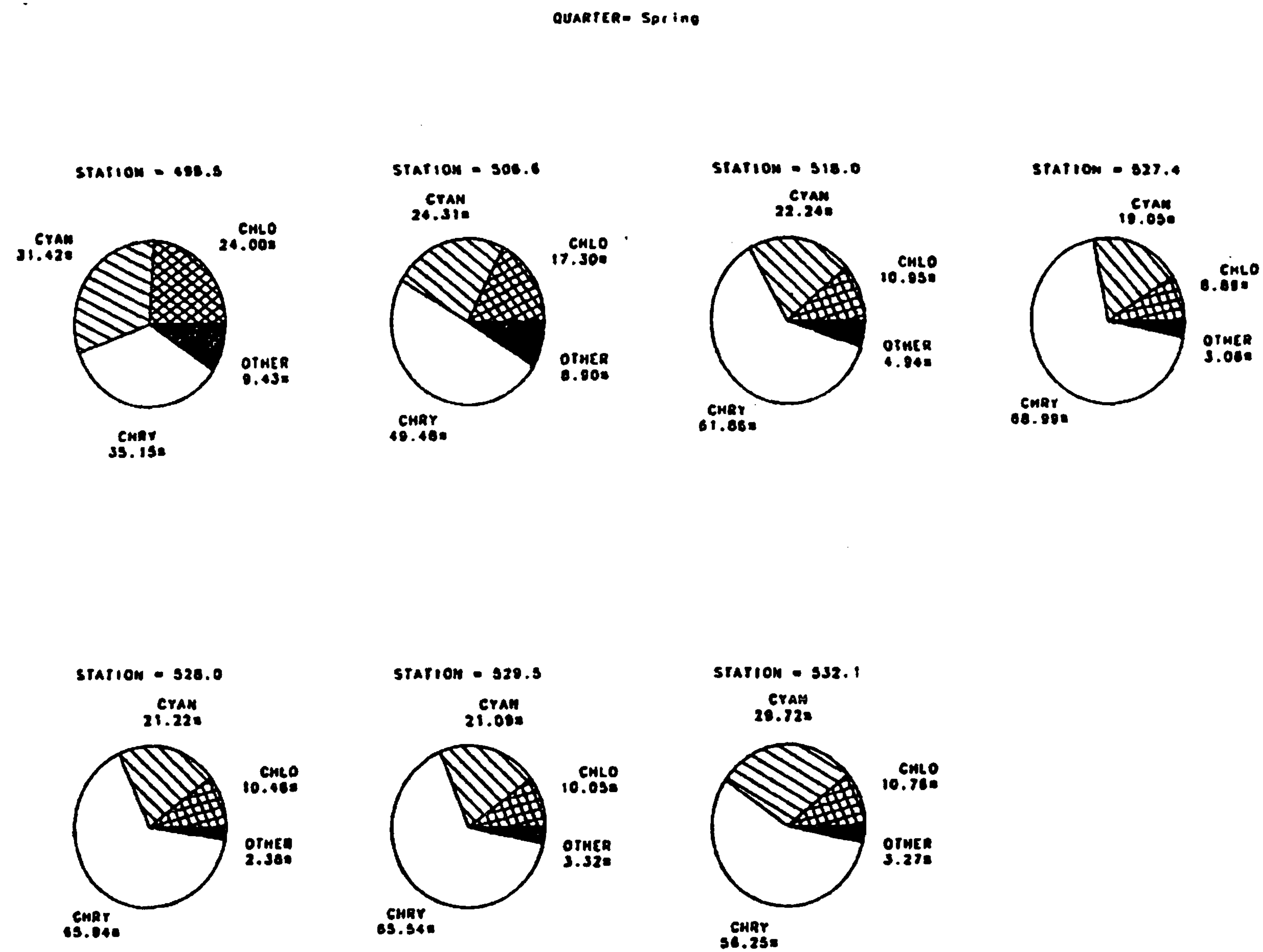


Figure 5-3. Percentage Composition by Major Group (Years Combined) of the Spring Phytoplankton Assemblage in the Vicinity of Watts Bar Nuclear Plant, 1973-1985.

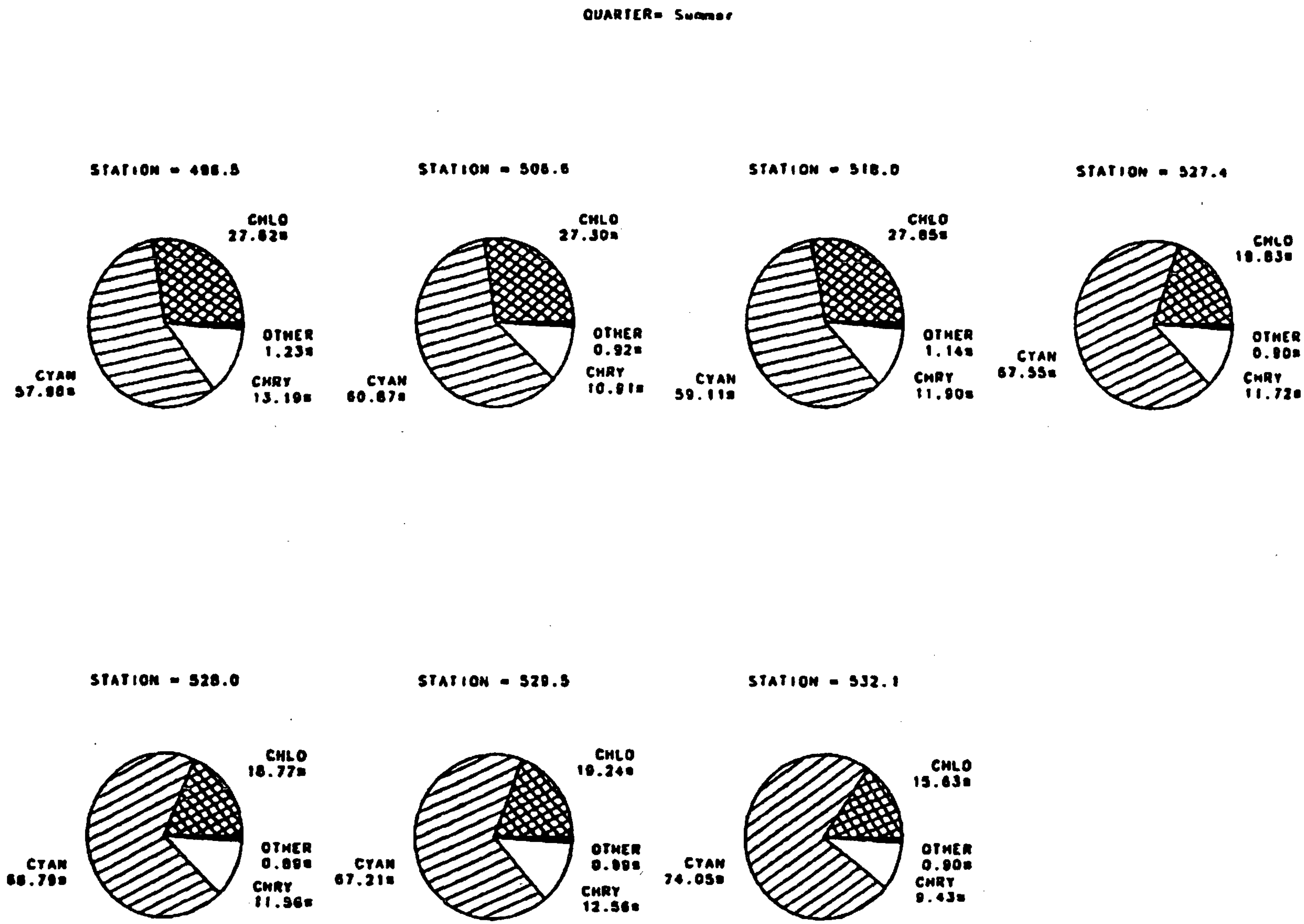


Figure 5-4. Percentage Composition by Major Group (Years Combined) of the Summer Phytoplankton Assemblage in the Vicinity of Watts Bar Nuclear Plant, 1973-1985.

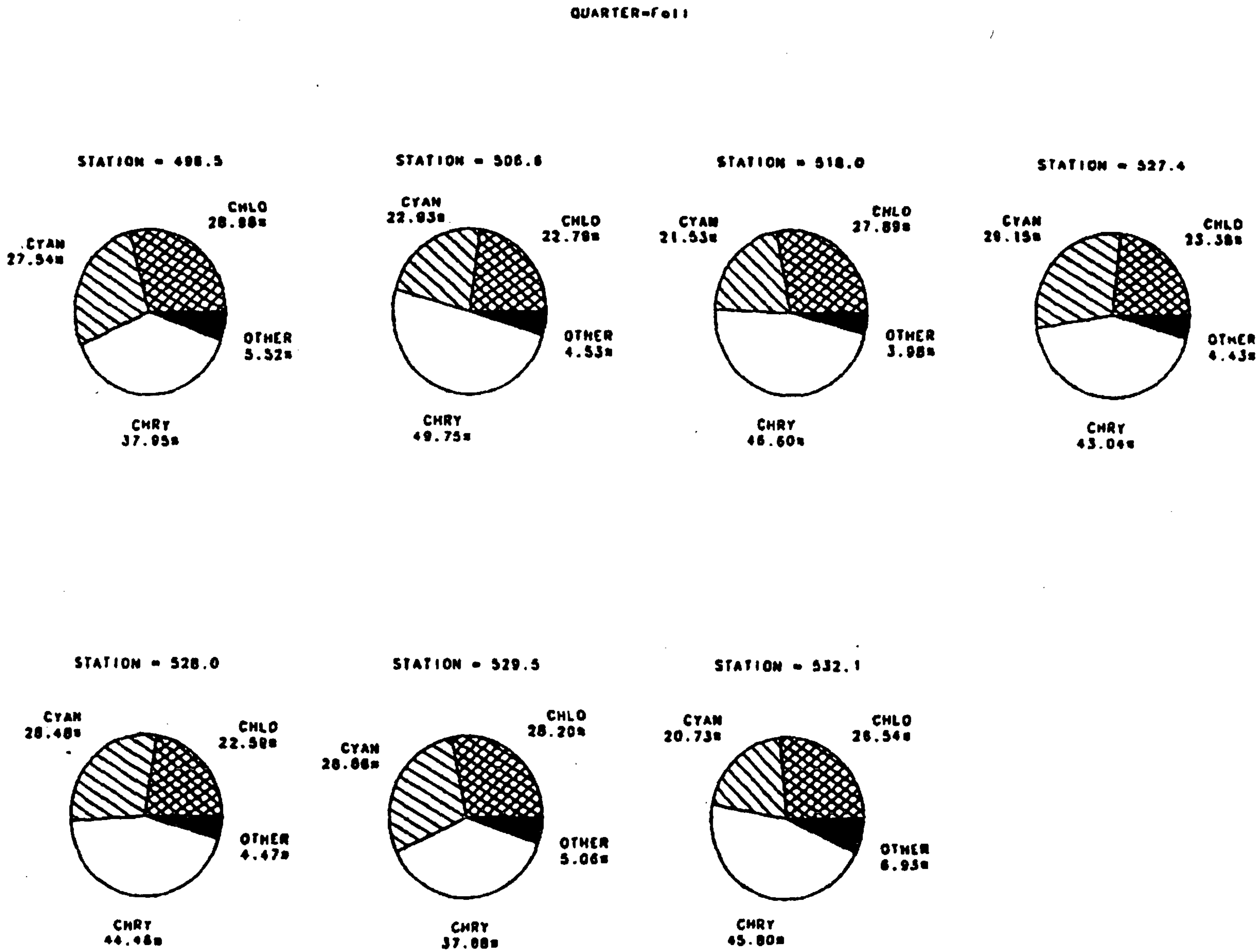


Figure 5-5. Percentage Composition by Major Group (Years Combined) of the Fall Phytoplankton Assemblage in the Vicinity of Watts Bar Nuclear Plant, 1973-1985.

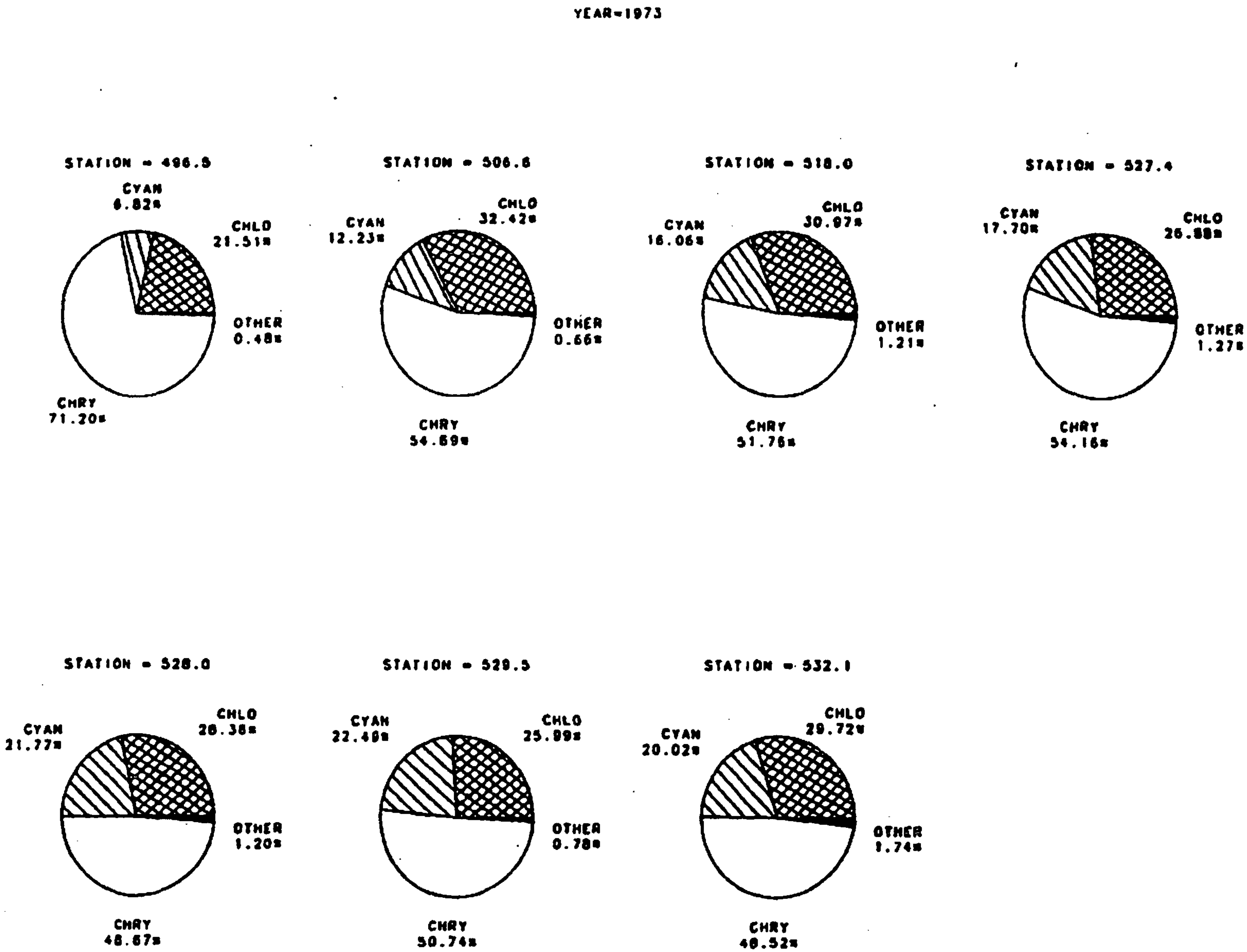


Figure 5-6. Percentage Composition by Major Group (Quarters Combined) of the Phytoplankton Assemblage at Each Station in the Vicinity of Watts Bar Nuclear Plant in 1973.

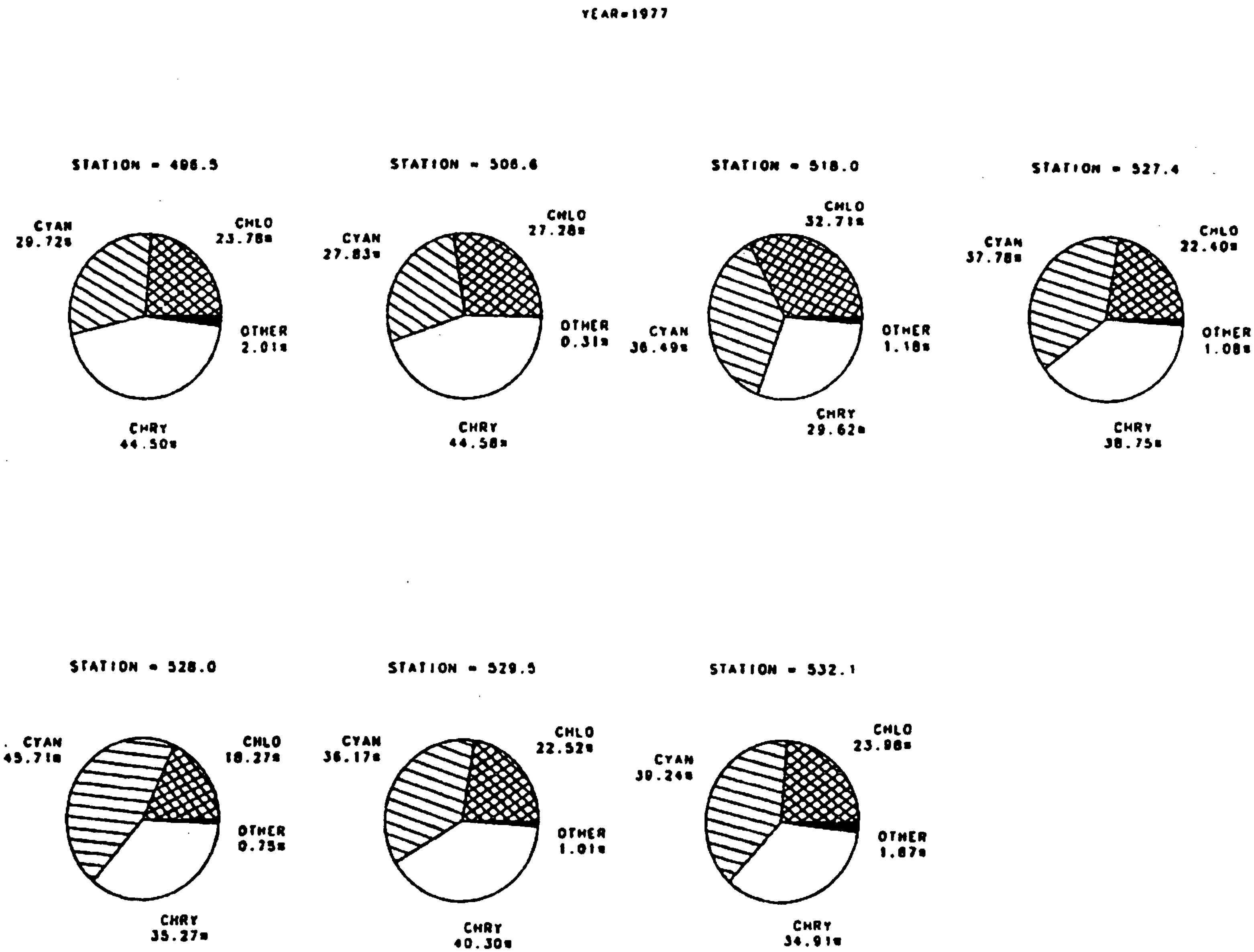


Figure 5-7. Percentage Composition by Major Group (Quarters Combined) of the Phytoplankton Assemblage at Each Station in the Vicinity of Watts Bar Nuclear Plant in 1977.

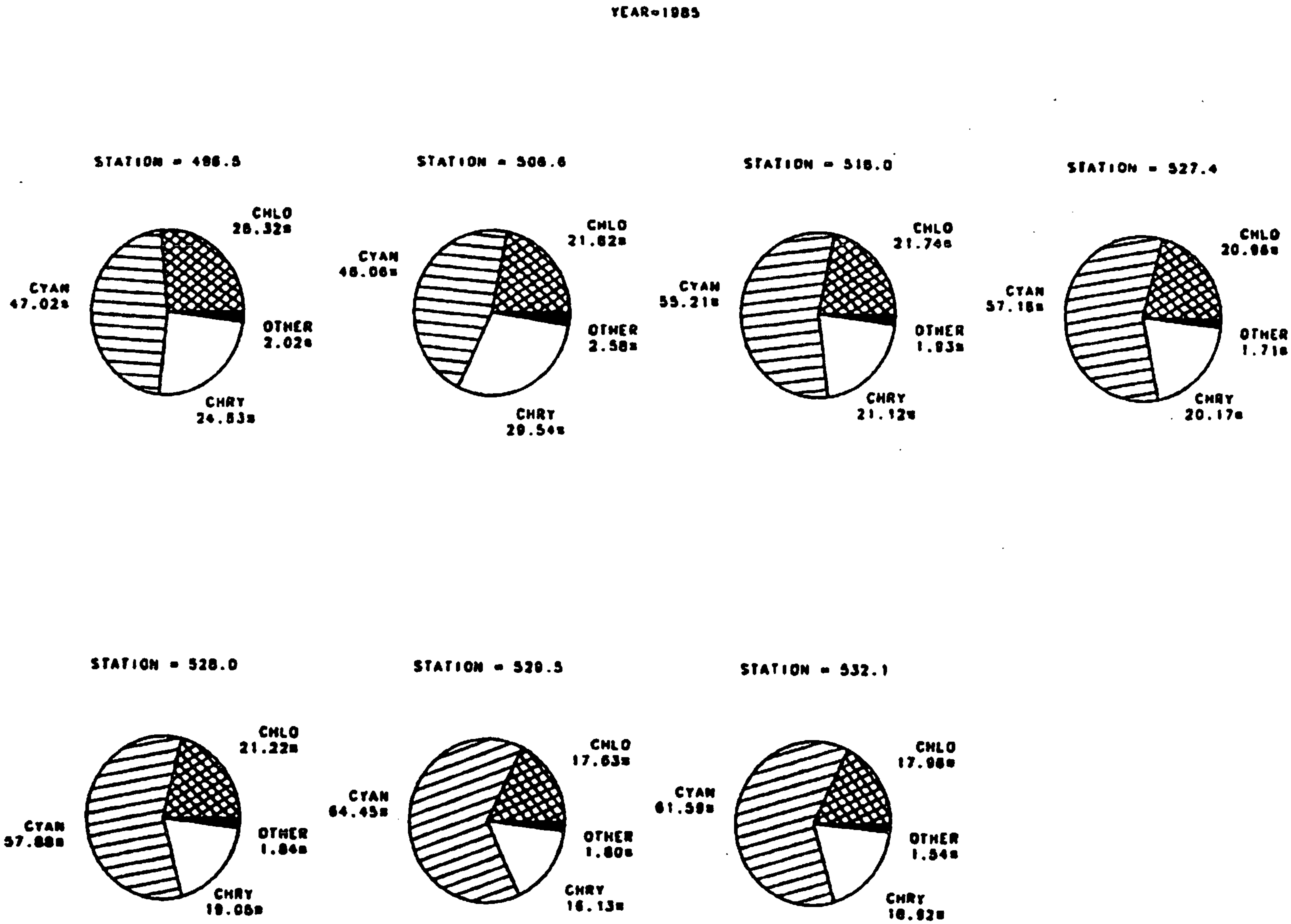


Figure 5-8. Percentage Composition by Major Group (Quarters Combined) of the Phytoplankton Assemblage at Each Station in the Vicinity of Watts Bar Nuclear Plant in 1985.

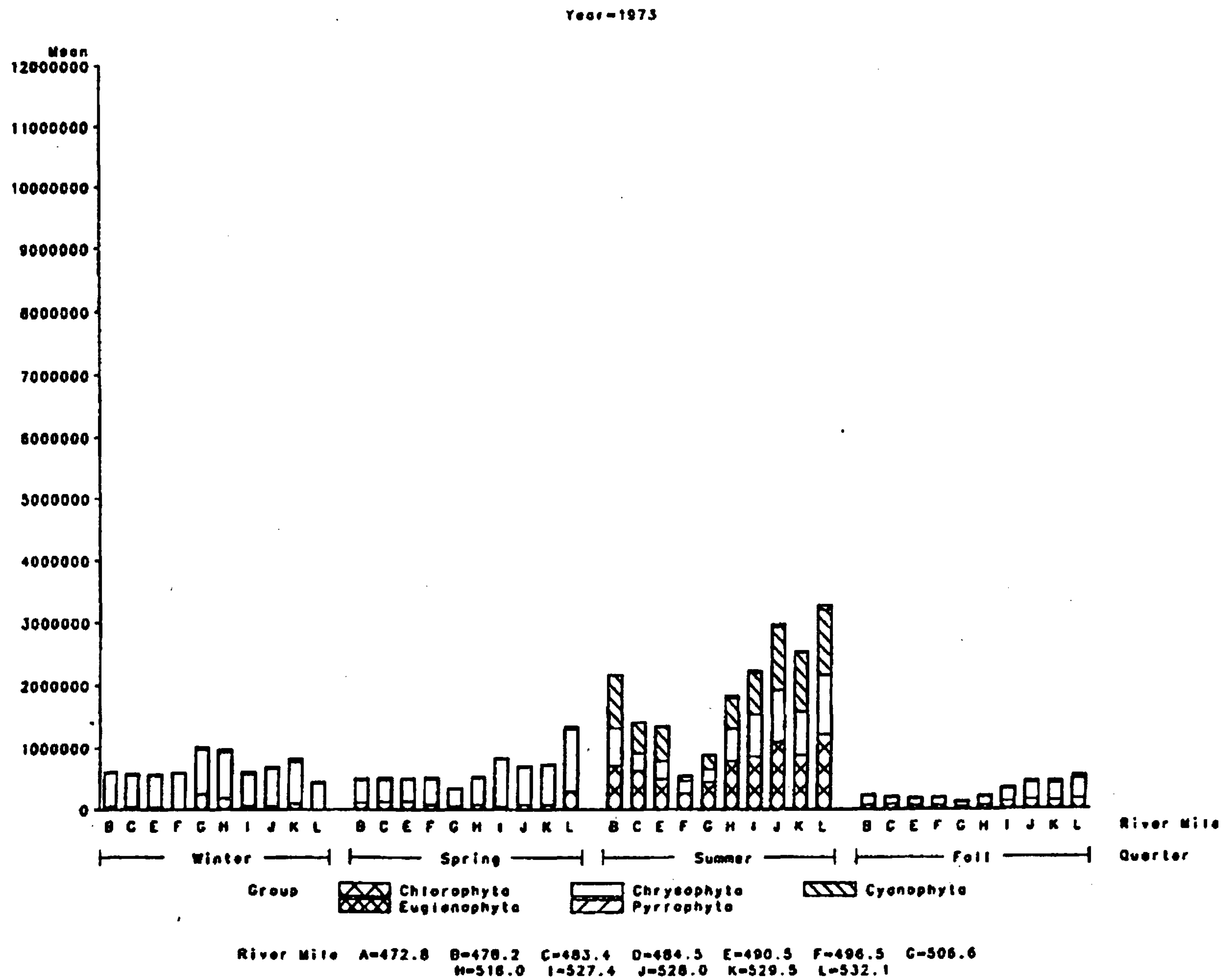


Figure 5-9. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1973.

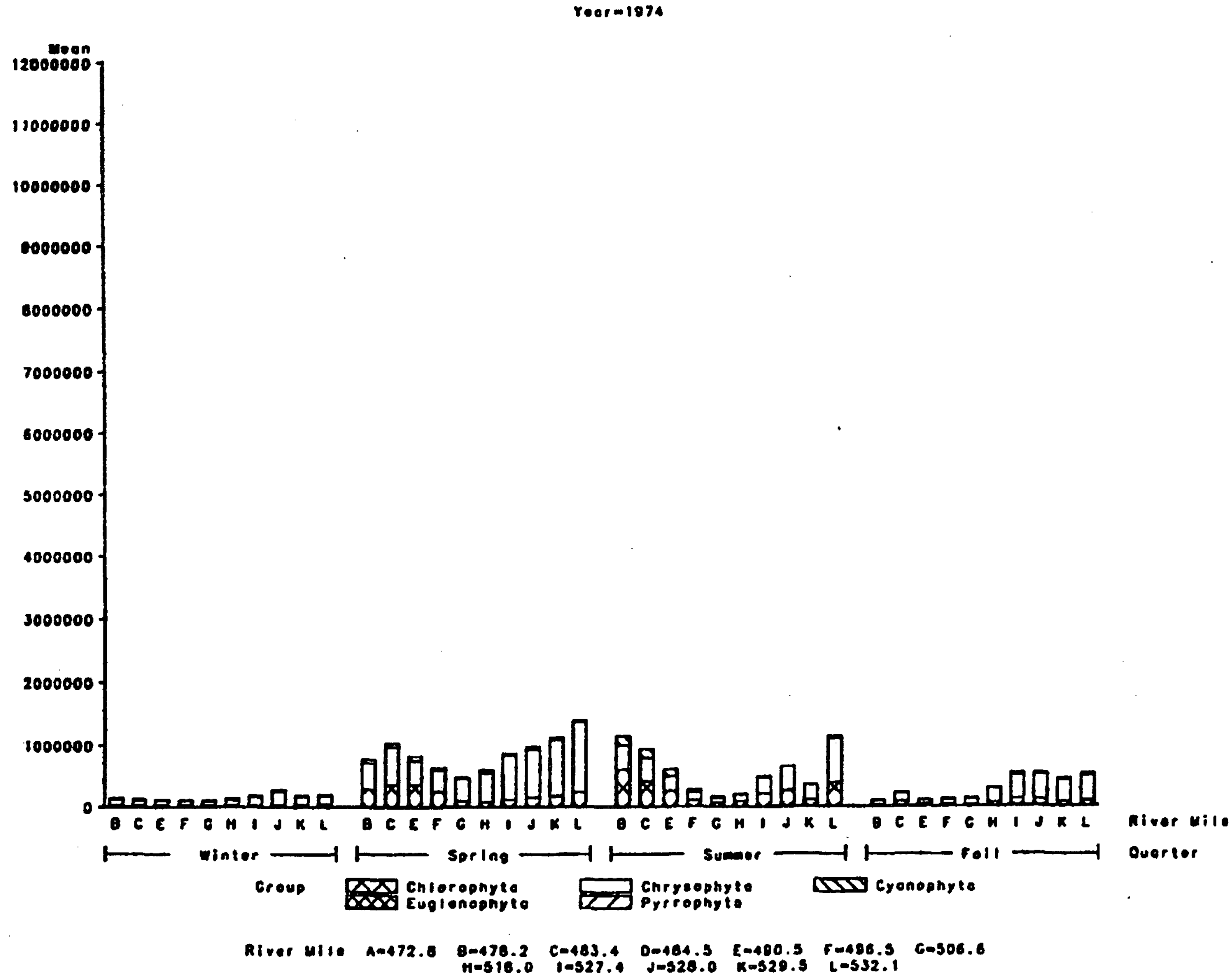


Figure 5-10. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1974.

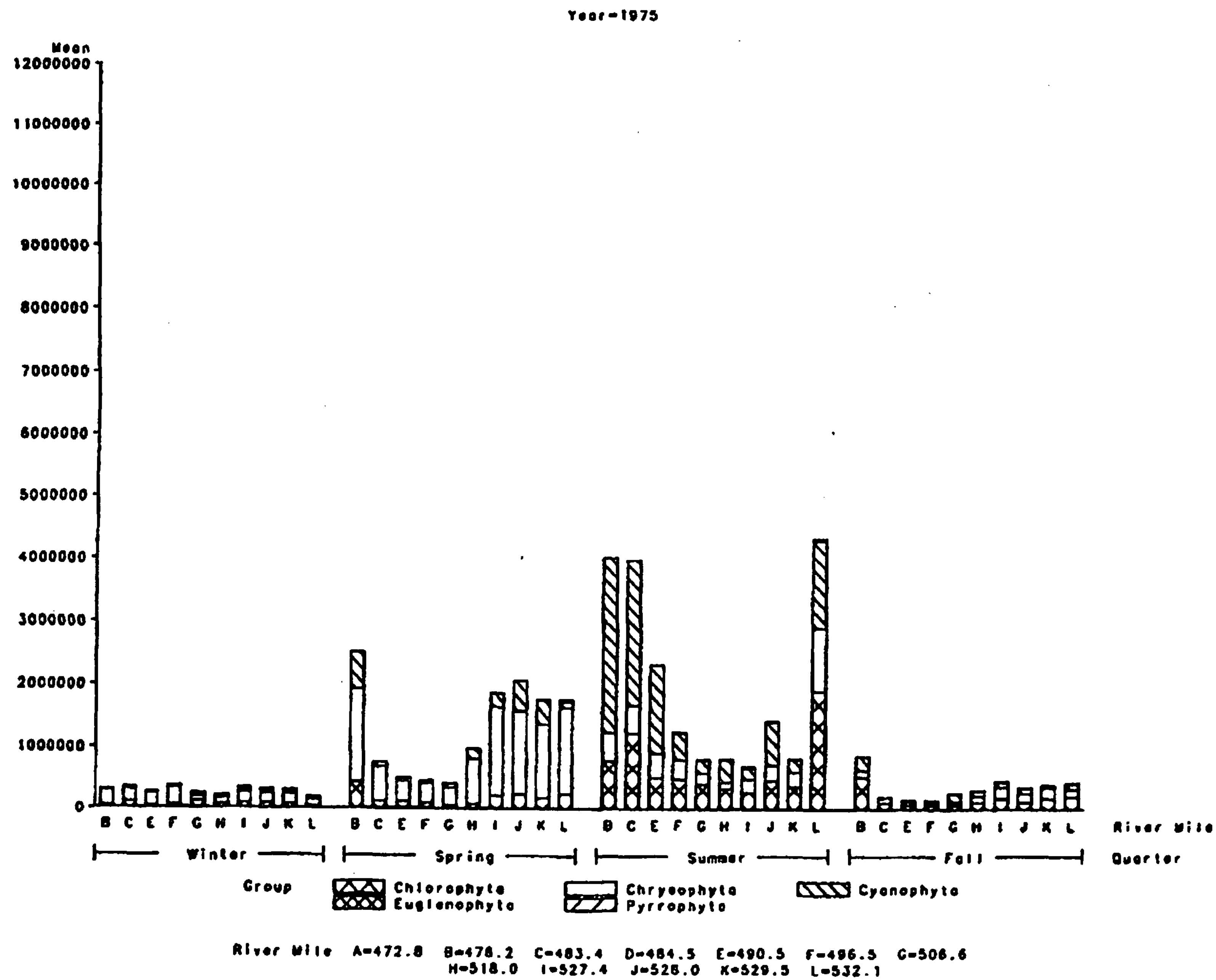


Figure 5-11. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1975.

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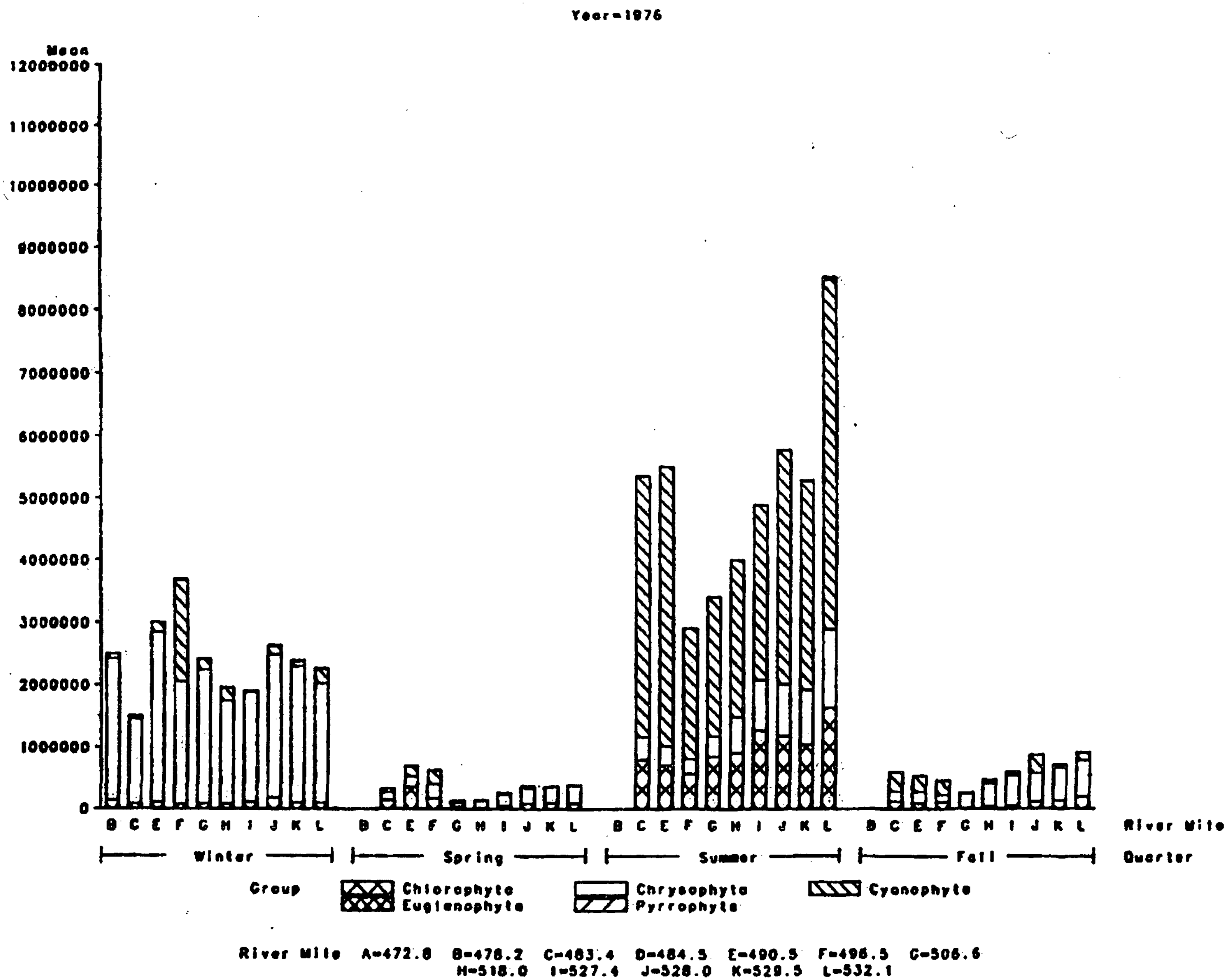


Figure 5-12. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1976.

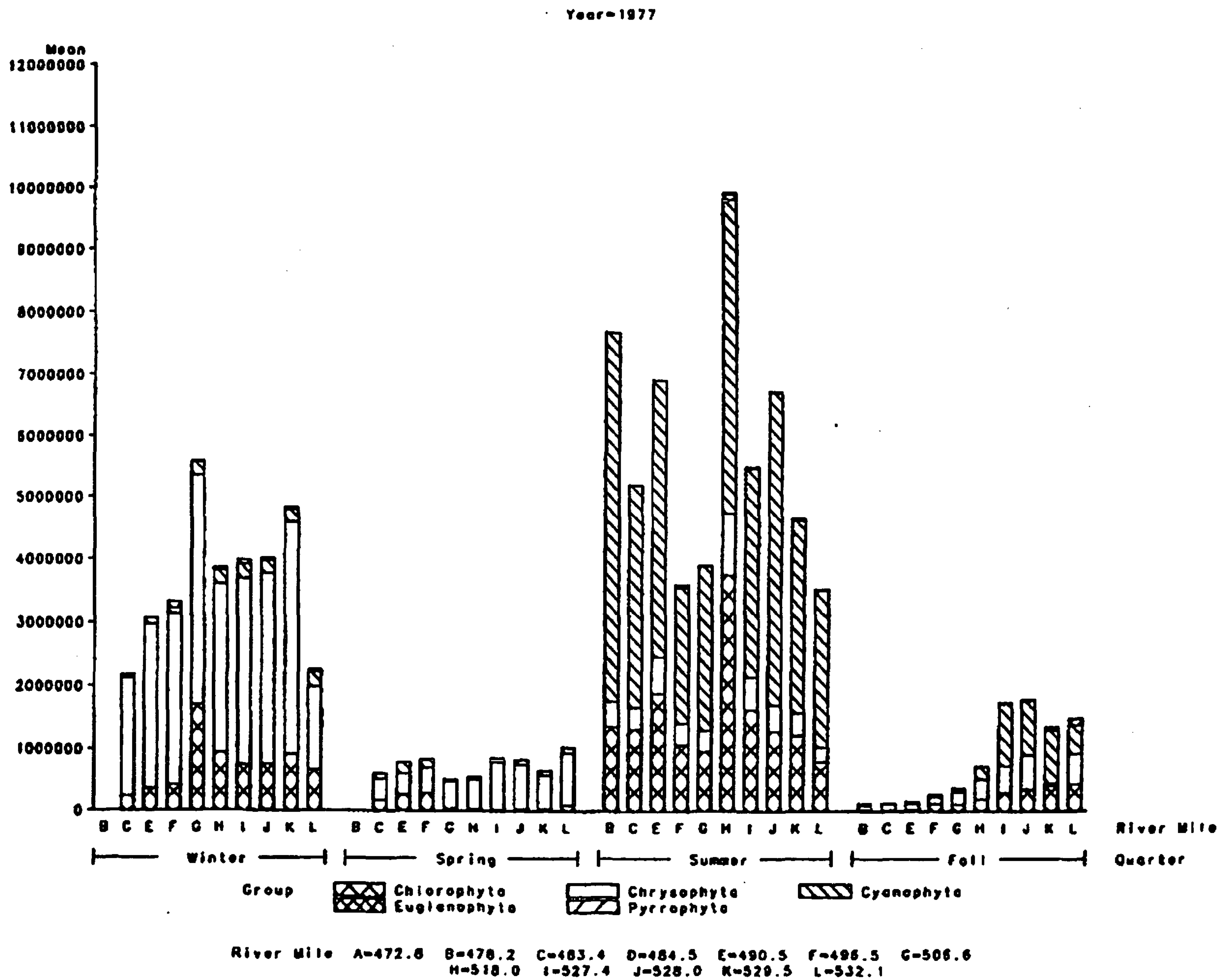


Figure 5-13. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1977.

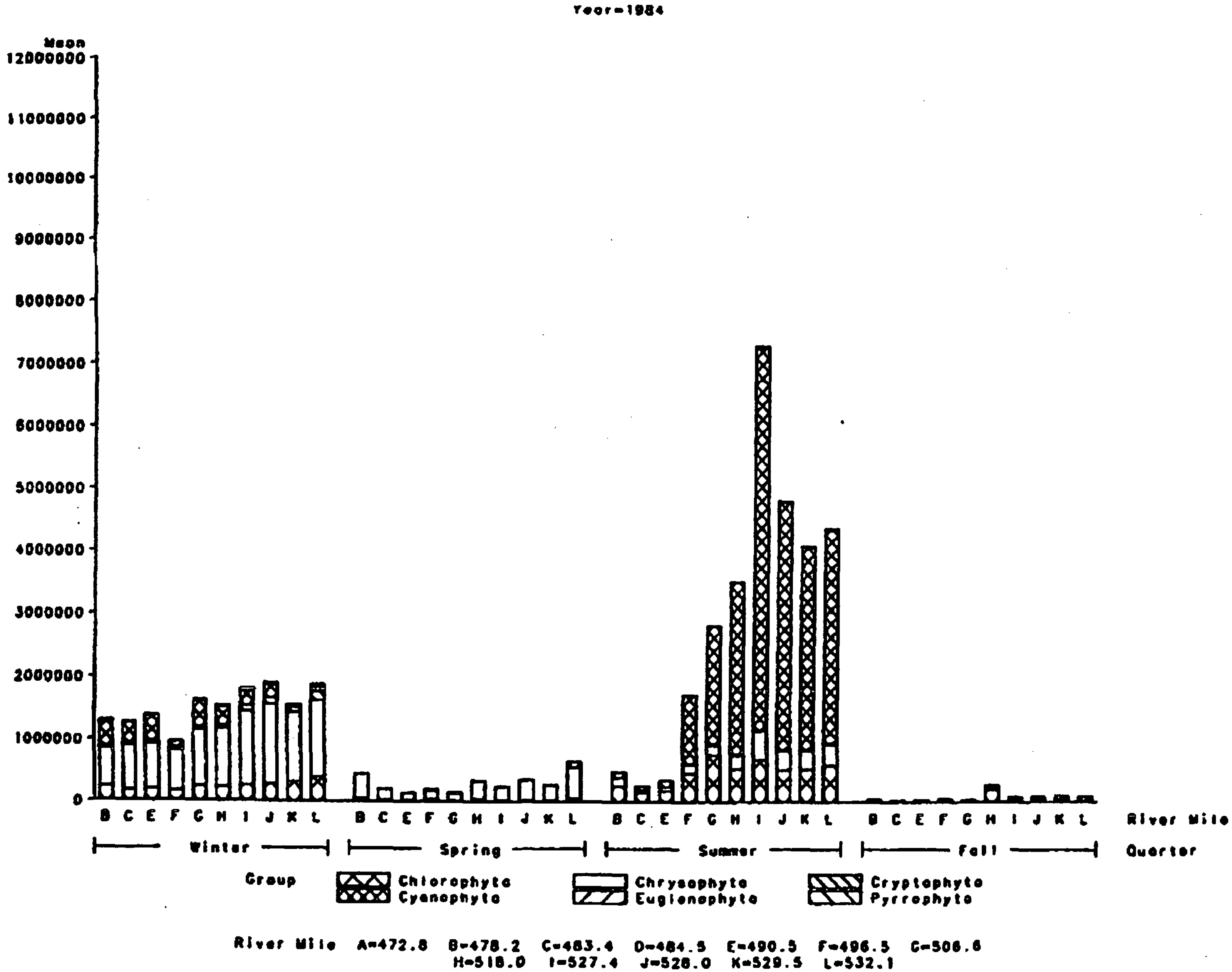


Figure 5-16. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1984.

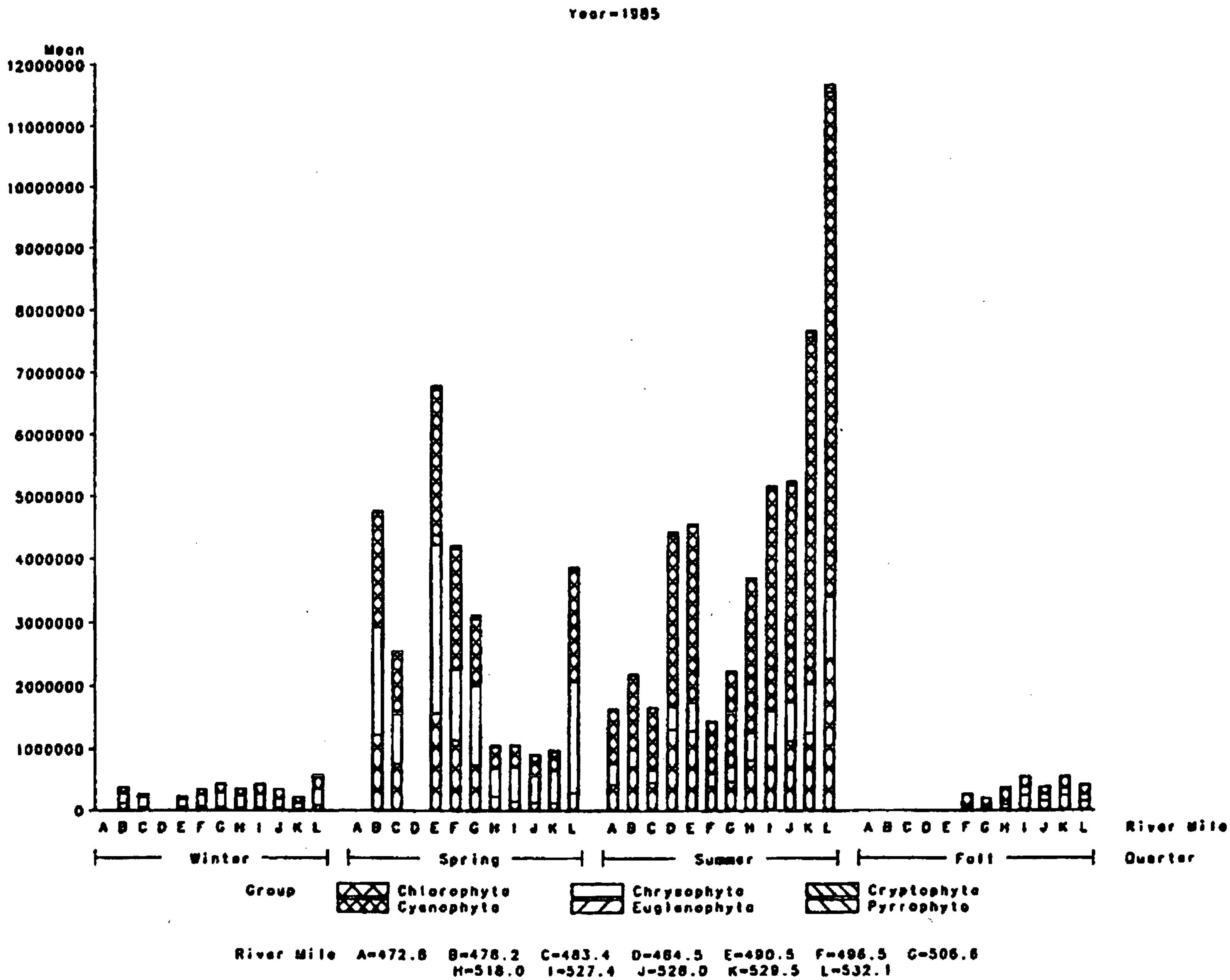


Figure 5-17. Phytoplankton Abundance by Group for Chickamauga Reservoir and Watts Bar Reservoir Forebay Sample Stations, Watts Bar Nuclear Plant, 1985.

5.3.1 Zooplankton Results and Discussion

In excess of 400 zooplankton samples were collected during 32 quarterly surveys for the preoperational monitoring period incorporating a nine-year spread between 1973 and 1985.

The primary purpose for reporting these data is to have baseline results which can be compared to data that will be collected during operation of the Watts Bar Nuclear Plant (WBN). The approach selected here is to present and discuss results for each season using the following two comparisons

(1) Description of Zooplankton Within the WBN Study Reach. This description is provided to assess preoperational baseline conditions, so that any shifts in community structure (numbers and composition) can be identified if they occur after the plant becomes operational. This evaluation was primarily based upon an analysis of total densities, total number of taxa, the diversity index derived from the total number of taxa, dominant and subdominant taxa, Sorenson's Quotient of Similarity (SQS), and the Percentage of Similarity (PS). Results presented include both spatial and temporal comparisons of the seven WBN stations (figure 5-1), which extended from station 4 at TRM 496.5 to station 10 (above the Watts Bar Dam) at TRM 532.1. (Stations 1 through 3 are associated with monitoring at Sequoyah Nuclear Plant, also on Chickamauga Reservoir, and were used in selected data analyses presented in subsequent paragraphs). Preoperational monitoring of WBN stations was carried out over two collection periods, extending from winter 1973 to winter 1978 and from spring 1982 to fall 1985.

(2) Trends in the Chickamauga Reservoir Community. This section examines trends observed in the zooplankton for both the seven WBN stations and the three (five for July 1985 data) Sequoyah Nuclear Plant (SQN) stations to provide an understanding and evaluation throughout the length of Chickamauga Reservoir. Initially, two-way ANOVAs were to be used to examine the spatial and temporal trends each year at the seven WBN stations, but the interaction term was significant in many of the tests, indicating that the involved spatial and temporal factors could not be considered as acting independent of each other. Therefore, it was decided that in lieu of the two-way ANOVAs, temporal comparisons would be based on the subjective evaluation of graphed density data while spatial comparisons would be determined from one-way ANOVAs and Student-Newman-Keuls (SNK) a posteriori tests. Spatial comparisons for the seven WBN stations alone and in conjunction with the three SQN stations were examined using either polynomial regression analysis or linear regression, depending on which provided greatest R^2 value (accountable variability). The three SQN stations were identified as: station 1 TRM 478.2, station 2 TRM 483.4 and station 3 TRM 490.5. The regression analyses were the only tests which included data from all ten stations on Chickamauga Reservoir.

It should be noted that because of the difficulty and expense with sampling the same watermass as it moves downstream, the most expedient compromise was to collect samples for a specific sample period on the same day. Hence, in most cases, collections at stations separated by several miles probably represented different watermasses, which in some cases may have accounted for differences in the zooplankton among sample locations.

Although in theory it would be better to sample the same watermass, monitoring programs such as this one must assume that the zooplankton is a continuum throughout the study reach. This assumption may be generally acceptable when travel time through the study reach is only a few days. However, it would be less valid when water temperatures are high or when there is a travel time of several days between stations. When these latter conditions occur, the data must be evaluated carefully with the above considerations in mind.

Winter

Description of the Zooplankton Within the WBN Study Reach (summarized in table 5-6 and figure 5-18, and detailed in appendices 5-H, 5-I, 5-J, 5-K, and 5-L)--Winter zooplankton densities would be expected to be lower than other times of the year due to the lessening of growth and reproductive rates in the colder water temperatures. As a result, zooplankton from flow-through reservoirs like Watts Bar and Chickamauga Reservoirs would not respond rapidly to environmental changes (such as shifts in food supply, minor temperature fluctuations, etc.), and generally similar densities would be expected among collection locations. This similarity would be even more pronounced under high flow rates, which increases the homogenity of the study reach.

A wide range of physical conditions existed throughout this study (see chapter 2). For the seven WBN stations, water temperatures on the winter sample dates ranged from 2.5° C (1977) to 9.0° C (1975), and flow rates between 19,400 cfs (1973) and 85,400 cfs (1975). Travel times between the Watts Bar Dam (at station 9) and the lowest WBN station (station 4 at TRM 496.6) varied between 16 hours (1975) to 2.25 days (1973). Travel times in winter generally were shorter than travel times of the other three seasons due to lower water surface elevations in winter. Short retention times coupled with lower water temperatures should have prevented drastic changes in the winter zooplankton composition and density as a watermass moved downstream.

Rotifers numerically dominated the winter zooplankton at the seven WBN stations for all years sampled. Copepods always were the second most numerous group, and cladocerans usually composed a negligible proportion of the zooplankton community. All samples indicated that either Keratella, Polyarthra, Synchaeta or copepod nauplii larvae were dominant or subdominant. Synchaeta was most frequently the dominant zooplankton animal in the winter collections.

Since rotifers consistently dominated the zooplankton, trends observed for total number of taxa, diversity indices, and total densities mirrored patterns in the winter rotifer populations. The lowest number of taxa generally occurred in 1973 and the highest in 1985, with a similar number of taxa collected between these two extremes. Diversity index values were expected to be lowest in the winter because only a few taxa usually dominate the community. The seven WBN stations exhibited these expected results for all years sampled, with a high value of only 2.43, and three values below 1.0 when Synchaeta comprised more than three-fourths of the total community density. The SQS values indicated that similar taxa usually existed at six of the seven WBN stations, with station 4 at TRM 496.5 often producing dissimilar results (most evident in 1977). The PS values also indicated a difference at station 4. The consistently observed difference between station 4 and the other six WBN stations is believed to be due in part to recruitment and an increase in allochthonous materials originating from the Hiwassee River entering at TRM 500 between station 4 and station 5. These differences were particularly evident during low flow years which allowed community changes to occur even in winter. It is also interesting to note that fewer SQS similarities (SQS value > 70 percent) were obtained for 1983-1985 when preoperational monitoring was reinitiated after a hiatus of five winters than were found from 1973-1977. However, PS values did not show a difference between the two WBN preoperational collection periods. Since SQS is more affected by the presence/absence of "rare" taxa than PS, fewer SQS similarities in 1983-85 than in 1973-77 were probably related to a greater sampling effort (three replicates) in the latter years than in the earlier years (two replicates). In most cases, a greater sampling effort can be expected to result in collecting more "rare" taxa. The lowest total densities in winter occurred in 1974 (range of 3.3 to 6.1 x 10^3 per m^3 at the seven WBN stations) and 1975 (range of 11.1 to 22.4 x 10^3 per m^3 at the seven WBN stations) when river flows were highest (68,800 cfs in 1974 and 85,000 cfs in 1975). No doubt these low densities reflect washout from high flows. In turn, highest total densities (range of 101.4 to 190.20 x 10^3 per m^3 at the seven WBN stations) occurred in 1977 when river flow was only 27,900 cfs. It is interesting to note that the coldest water temperature of 2.5° C also occurred during this sample period, and that instead of the typical rotifer genus Synchaeta being dominant, another rotifer, Keratella, was dominant. No long-term temporal trends were evident in the winter zooplankton densities.

Trends in the Chickamauga Reservoir Community (summarized in table 5-7)--The one-way ANOVAs examining spatial (upstream/downstream) trends at the seven WBN stations provided only two significant tests copepod densities in 1977 and 1984. In 1977 the highest mean copepod densities at station 10 (the only site above the Watts Bar Dam) were significantly different from the lowest mean copepod densities at stations 4 and 6, while in 1984 the highest mean copepod densities at sites 10 and 8 were significantly different from the lowest mean densities at site 5. These results indicate that in 1977 and 1984 copepod densities were lower at the downstream stations than at the upstream stations. Regression analysis run on the ten combined WBN and SQN stations produced significant polynomial equations in 1977, 1983, and 1984. These regression curves did not produce any consistent trends. Regression analysis on 1976 data was significant but this result is of limited use because data only were collected at one WBN station (station 4) in this year.

Spring

Description of Zooplankton Within the WBN Study Reach (summarized in table 5-8 and figure 5-19 and detailed in appendices 5-H, 5-I, 5-J, 5-K, and 5-L)--In contrast to the anticipated low densities of zooplankton in the winter, spring would be expected to exhibit high numbers of animals. This expectation is due primarily to heavy recruitment of zooplankton, increased ambient temperatures, and high allochthonous material load continually being introduced into the study area by runoff from rain showers. The slower moving pool-like reservoir waters provide good habitat for growth and reproduction. Zooplankton from the forebay of Watts Bar Reservoir could be introduced into the study reach, collected at the sampled stations, and produce the expected high spring densities. Likewise, slowly moving areas of Chickamauga Reservoir would allow increases to be manifested.

The physical data at the seven Watts Bar stations on the spring sample dates showed water temperatures ranged from 16.5° C (1982) to 21.0° C (1985), and flow rates from only 7,100 cfs (1985) and 8,700 cfs (1982) to 40,100 cfs (1984). Travel times between the Watts Bar Dam (at station 9) and the lowest WBN station (station 4 at TRM 496.6) generally ranged between 2 and 3.5 days, except for 1976 (7 days), 1982 (11 days) and 1985 (13 days). Travel times between station 10 (above the dam) and station 9 (at the dam) were generally sufficiently slow (ranging from 10 hours to 2.2 days, and averaging about 20 hours) to allow time for mature zooplankters to continue the reproductive and growth cycles started in the Watts Bar Reservoir forebay. Travel times between the six WBN stations within Chickamauga Reservoir were the most varied of the four seasons.

Unlike winter, complete numerical dominance by rotifers was not always evident at all seven WBN stations in the spring, and cladocerans no longer represented a negligible portion of the zooplankton community. In 1973, rotifers dominated the upper four Watts Bar stations but were replaced at the lower stations (4, 5, and 6) by cladocerans. Cladocerans also dominated the spring zooplankton for stations 5 through 10 in 1974, all seven stations in 1975, stations 4-9 in 1976, and stations 5 and 6 in 1982.

Rotifers were the most abundant zooplankton group at station 4 in 1974, and stations 4, 7, 8, 9 and 10 in 1982, and (with one exception in 1976) always were the second most numerous group during those years when cladocerans were the dominant zooplankters. The last three collection years of 1983-1985 as well as 1977 yielded a complete dominance of rotifers over the other two groups in a manner similar to the winter collections. Copepods only were dominant at station 10 in 1976. All spring samples indicated that <u>Keratella</u>, <u>Synchaeta</u>, <u>Polyarthra</u> or <u>Conochilus unicornis</u> were the dominant or subdominant rotifers, and that <u>Bosmina longirostris</u> was the most abundant cladoceran species. Nauplii were the common copepod taxon present in the spring zooplankton.

Except for 1983-1985 when rotifers completely dominated the zooplankton, trends observed for the total number of taxa, diversity indices, and total densities reflected patterns occurring in both the rotifers and cladocerans. Number of taxa at a single station ranged from 16 taxa in 1982 to 39 taxa in 1974 and 1985. The highest number of taxa for all years except 1983 occurred at station 4, with the station above Watts Bar Dam producing the highest taxa number in 1983 and either the second or third highest number of taxa for all other years. All diversity indices would be expected to show moderate to high values in the spring reflecting the recruitment and allochthonous materials being introduced into the system from reservoirs (like Watts Bar at station 10) and rivers (like the Hiwassee between stations 4 and 5). The diversity index value for the seven WBN stations ranged from 0.84 to 3.18, with either station 4 or station 10 possessing the highest values for all years except 1975, 1982 and 1983. The

SQS values were consistently highest in spring (except for 1985), fluctuating less than the SQS values for the other three seasons, indicating that similar taxa were generally present at all seven stations. However, the PS values were varied and usually quite low (considerably less than 70 percent), reaching the low values of only 4 percent to 9 percent for the comparisons of station 4 with station 6 through 10 in 1983. Since the SQS values are more affected by the presence/absence of "rare" taxa than the PS values' these SQS and PS values suggest recruitment of both "rare" and common taxa into the study reach from areas such as the Watts Bar forebay or the Hiwassee River (at TRM 500). Station 10 also demonstrated the highest total densities of zooplankton for all years except 1983 and 1985, again suggesting an abundance of animals which could be transported downstream to the other six stations. Likewise, the lowest or second lowest total density values were collected at station 5 (at 506.6 TRM just above the Hiwassee River) for all years except 1983 and 1985, with station 4 (at TRM 496.5, below and receiving drainage from the Hiwassee River) showing an increase in total densities for all years except 1973, 1976, and 1983. Although the Watts Bar Reservoir at station 10 and the Hiwassee River between stations 4 and 5 appear to be the primary sources of recruitment and allochthonous materials, other, smaller tributaries and overbank areas could be involved in this addition of allochthonous materials. Possible locations of introduction of nutrients include the Dake Branch at TRM 528 (by site 8), Yellow Creek at TRM 527 (by site 7), and Sewee Creek at TRM 524.5 (between sites 6 and 7). As with the winter data, no long term temporal trends were evident in the spring zooplankton densities. However, Rotifera did appear to be more dominant during the latter three years than in previous years.

Trends in Community Densities for the Chickamauga Reservoir (summarized in table 5-9)--The one-way ANOVA and associated SNK tests for the seven WBN stations produced significant tests for all zooplankton groups during all years except cladocerans in 1973, 1982, 1983, 1984 and 1985; copepods in 1983; rotifers in 1975; and total zooplankton in 1982. The general pattern of the SNK tests revealed that station 10 was significantly different from station 5 and usually one or both of stations 4 and 6. All of the significant spring zooplankton tests substantiated the two significant winter SNK tests which separated the downstream WBN stations from the upstream stations. These results strongly suggest a decrease due organisms being removed from the water column or due to dilution as the zooplankton moved downstream from Watts Bar Dam. Regression analysis performed on the combined WBN and SQN stations indicated significant polynominal regression equations for all years except 1974 and 1982. The explained variability (R^2 values expressed as a percent) ranged from 42 percent (1983) to 84 percent (1976). All of the regression curves possessed minima between stations 4 and 5 and maxima at either station 1 (1975, 1976, and 1983) or station 10 (all other years). Station 10 also demonstrated the next highest sub-maximal values in the three years when maxima were evident at station 1. These results indicate the decreases in densities observed in the WBN study reach were followed by increases in lower portions of Chickamauga Reservoir, probably as a result of reduced velocities there.

Summer

Description of the Watts Bar Community (summarized in table 5-10 and figure 5-20 and detailed in appendices 5-H, 5-I, 5-J, 5-K, and 5-L)-- Zooplankton densities in the summer and fall seasons would be expected to be between the high spring and low winter results. Relatively consistent flows and travel times would be involved in introducing zooplankton and allochthonous material into the seven station WBN study reach from breeding areas like the pool-like Watts Bar Reservoir forebay and Hiwassee River.

Physical data collected during summer at the seven WBN sites revealed consistency in the ranges of temperature (24.5° C - 28.5° C, with station 10 possessing the highest temperatures for every year except 1974). Flow rates varied between 21,000 and 38,900 cfs. Travel times between the Watts Bar Dam at station 9 and the lowest WBN station (station 4) were 2.5 to 3.6 days, and travel times from the above dam site at station 10 to the dam at station 9 were 9.0 - 17.0 hours.

Rotifers completely dominated the zooplankton at all stations in 1976, 1977, 1982, 1983, and 1984, and selected stations in 1973, 1974, 1975, and 1985. While copepods and cladocerans usually were equally subdominant in all years, cladocerans were the dominant group at stations 4 and 5 in 1973, stations 5 and 6 in 1974, and stations 5, 8, and 9 in 1975, and copepods were dominant at stations 4, 7, 8 and 9 in 1974 and all stations except station 4 in 1985. All three zooplankton groups generally were highest at the upstream station and gradually declined in a downstream direction. Increases in rotifer density also were evident between stations 4 and 5 for all years except 1973, 1976 and 1984, possibly due to recruitment and the introduction of allochthonous materials from the Hiwassee River just downstream from station 5. Common rotifers during the summer sampling included Keratella, Brachionus angularis, Ploesoma truncata and Conochiloides, with Brachionus budapestinensis and Asplanchna occasionally occurring as subdominant species. The cladoceran Bosmina longirostris was the dominant taxon at stations 4 and 5 for all years except 1976, 1977, and 1982. Copepod nauplii were the subdominant taxon at station 4 for all years except 1973, 1982, and 1983.

As might be anticipated, patterns observed in the total number of taxa, diversity indices, and total densities were primarily due to rotifers. Total number of taxa ranged from 14 (1974) to 39 (1982). Two patterns were evident for the total number--one for 1973-1977 and the other for 1982-1985. In the earlier five summers of monitoring, station 5 (directly upstream of the Hiwassee River) exhibited the lowest number of taxa in all years except 1973, while the highest taxa number was collected downstream of the Hiwassee River at station 4 (1975 through 1977), in Watts Bar Reservoir at station 10 (1974), or at the mouth of the Yellow Creek at station 7 (1973). The latter four years of preoperational monitoring did not show any consistent pattern of stations with highest or lowest number of taxa except station 5 where number of taxa was generally low. Diversity index values ranged from 2.23 (1976 and 1983) to 3.61 (1975), but did not produce as distinct a pattern as was seen for the number of taxa. However, station 4 (directly downstream from the Hiwassee River) did show highest values in 1974 through 1976 and in 1982, and either stations 5 or 6 the lowest values in 1974 and 1982 through 1985. Almost all of the SQS values for the nine summer sample dates were high (> 70 percent), while usually only the PS comparisons of stations 7 with 8, 7 with 9, and 8 with 9 possessed values approaching 70 percent or greater. The lowest PS values were calculated for the station 4 comparisons with other stations. All of these results indicate community similarity in this part of the study reach due to proximity of stations and short travel times. Long-term temporal trends were not apparent in the summer Watts Bar zooplankton results.

Trends in the Chickamauga Reservoir Community (summarized in table 5-11)--One-way ANOVAs evaluating spatial (upstream/downstream) trends in densities indicated significant tests for all the zooplankton groups during the eight collection years except for rotifers in 1984, copepods in 1977, cladocerans in 1982, 1983 and 1984, and total zooplankton in 1983 and 1984. The general pattern for the SNK tests showed station 10 (above Watts Bar Dam) overlapping in density with stations 9, 8 and sometimes 7, but significantly different from stations 4, 5 and (usually) 6. As with the winter and spring SNK results, this pattern revealed a progressive decrease in zooplankton densities as water flowed from the Watts Bar Reservoir (at station 10) downstream. Regression analysis on the ten stations from the combined WBN and SQN data yielded significant polynomial equations for all years. The explained variability (based on the R^2 values x 100) ranged from 23 percent in 1983 to a highly significant 89 percent in 1973. All significant summer regression curves showed a decline from the above Watts Bar Dam site at station 10 to a minimum at station 4 or 5, and then an increase for the three SQN stations downstream. In 1973, the decline occurred through station 3 at TRM 490.5 (the only SQN station upstream from the Sequoyah Nuclear Plant), followed by a negligible increase for Sequoyah stations 1 and 2. Only in 1977 did the predicted density at station 1 surpass the density value for station 10. These results indicate that, contrary to results for spring, the zooplankton community did not "recover" in Chickamauga Reservoir to levels observed in Watts Bar Reservoir forebay.

Fall

Description of the Watts Bar Community (summarized in table 5-12 and figure 5-21 and detailed in appendices 5-H, 5-I, 5-J, 5-K, and 5-L)-- Zooplankton results for the fall at the seven WBN stations would be expected to resemble overall trends observed in the summer but with lower densities. Consistent flow rates, travel times, and temperatures would be involved in the introduction and maintenance of both zooplankton and nutrients into the study reach.

Physical data during fall for the nine collection years indicated temperatures ranged between 13.2° C and 18.1° C and flow rates between 22,400 and 36,100 cfs. Travel times from station 9 at Watts Bar Dam to the most downstream WBN station 4 at TRM 496.6 varied between 1.8 and 2.5 days for all years except 1983 when the travel time was 3.3 days. Travel times between the above dam station 10 and station 9 were between 13.2 and 18.1 hours.

Rotifers either dominated at all stations or at the upper WBN stations during all years except 1984 when cladocerans were dominant at all stations. Cladocerans were usually the dominant group when rotifers were not dominant. All three zooplankton groups generally showed an overall decline from upstream to downstream. Most years also demonstrated minor increases between stations 4 and 5, possibly as a result of recruitment and material introduction from the Hiwassee River upstream from station 4. Common fall zooplankton included the rotifers Keratella and Synchaeta and occasionally Polyarthra, the cladoceran Bosmina longirostris, and copepod nauplii, cyclopoid copepodids, and occasionally adult Cyclops vernalis. Taxon dominance always was confined to three species--Bosmina longirostris (station 5 through 8 in 1973, stations 4 and 5 in 1974, stations 4 through 7 in 1982 and all seven stations in 1983 through 1985), Keratella (stations 6 through 10 in 1974, stations 5 through 10 in 1975, all seven stations in 1976, stations 5 through 9 in 1977, and stations 9 and 10 in 1982) or Synchaeta (stations 9 and 10 in 1973, station 6 in 1975, station 10 in 1977 and station 8 in 1982).

As with previous seasons, the fall patterns for total number of taxa, diversity indices, and total densities generally followed that of rotifers. Total number of taxa ranged from 16 (1983) to 35 (1975 and 1983), always peaking at station 4, 9 or 10, and attaining the lowest values at station 5 or 6 in all years except 1977. The increases at station 4 could have been due to the influence of the Hiwassee River upstream of station 4. Diversity index values ranged from 0.68 (1983) to 3.25 (1975), and always demonstrated a peak at station 4 or 10 and a low point at station 5 for all years except 1974 and 1976. The above number of taxa and diversity index results further supported the possibility of the introduction of zooplankton and nutrients from not just the Watts Bar Dam at station 10, but also the Hiwassee River between stations 4 and 5. As with the spring data, most of the SQS values for the nine fall collection dates approached or exceeded 70 percent, while all of the PS comparisons yielded low values (less than 70 percent) except stations 7 with 8, 7 with 9, and 8 with 9. Again, these results indicate similarity of the zooplankton in this rapidly flowing section of the study area. No long-term temporal trends were noticed for the fall Watts Bar zooplankton results.

Trends in the Chickamauga Reservoir Community (summarized in table 5-13)--Evaluation of the upstream/downstream trends by use of one-way ANOVAs and SNKs revealed significant tests for all comparisons except cladocerans in 1982. Virtually all of the SNK tests separated the upper four WBN stations from lower stations 4, 5 and 6, with either station 9 or 10 having the highest mean value. As was noted for the other three seasons, the ANOVA and SNK tests indicated a progressive decrease in the zooplankton densities as water moved downstream from the Watts Bar Reservoir (station 10). Regression analysis performed on the combined SQN and WBN stations exhibited significant polynomial equations for all eight collection years. Accountable variability (the regression coefficient R^2 expressed as a percent value) ranged from 55 percent (1977 and 1983) to 90 percent (1973). The regression curves also exhibited the highest predicted densities at station 10 followed by a continual decrease downstream until minima were obtained at stations 3 (1977 and 1984) or station 4 (all other years). These results agree with results for summer in showing that the zooplankton community did not "recover" in Chickamauga Reservoir to levels observed in Watts Bar Reservoir forebay.

5.3.2 Zooplankton Summary

Results for this monitoring program show generally similar patterns for all quarters when extreme conditions (e.g., high river flows) did not exist. The zooplankton community typically was composed of the same taxa throughout the study reach, although taxon dominance and densities were usually quite different among sample locations. The typical trend for spring, summer, and autumn (and occasionally winter) was for highest densities to occur at the location in Watts Bar Reservoir forebay, followed by substantial decreases in the swiftly flowing section of Chickamauga Reservoir near WBN and several miles downstream, and then an increase (usually slight) at the last downstream location. This pattern was expected given the differences in habitat within the study reach.

To further examine these upstream to downstream differences, information from the SQN monitoring program, which included sample locations further downstream in Chickamauga Reservoir, was analyzed along with WBN data. This combined data set indicated that in most cases the increase observed at the last WBN location continued further downstream into Chickamauga Reservoir usually to a level comparable to that at the Watts Bar Reservoir forebay location. Addition of SQN information proved useful in understanding zooplankton dynamics in Chickamauga Reservoir.

Table 5-6. Summary of the Winter Zooplankton Community Data for the Seven Watts Bar Stations During the Preoperational Study

Year	Dominant Group		Dominant Taxa		Number of Taxa	Diversity Index (D Bar)	SQS*	PS†
1973	Rotifera	7 sta.‡	<u>Synchaeta</u>	7 sta.	Range 12–17	1.32–1.98 6 sta. 0.34 1 sta.	All but 1 SQS ≥ 70%	8 PS ≥ 70% All sta No. 4§ PS < 70%
1974	Rotifera	7 sta.	<u>Synchaeta</u>	7 sta.	Range 19–26	2.07–2.43 7 sta.	All SQS ≥ 70%	All PS ≥ 70%
1975	Rotifera	7 sta.	<u>Synchaeta</u> Nauplii Both	4 sta. 2 sta. 1 sta.	Range 17–22	1.89–2.28 7 sta.	All but 2 SQS ≥ 70%	16 PS ≥ 70%
1976	Rotifera	1 sta.	<u>Keratella</u>	1 sta.	Only 1 sta. 21	Only 1.52 1 sta.	¶	¶
1977	Rotifera	7 sta.	<u>Keratella</u> <u>Synchaeta</u>	6 sta. 1 sta.	Range 17–22	1.67–1.75 7 sta.	14 SQS ≥ 70% All sta. No. 4 SQS < 70%	All but 1 PS ≥ 70%
1982#	–	–	–	–	–	–	–	–
1983	Rotifera	7 sta.	<u>Synchaeta</u>	7 sta.	Range 15–23	1.23–1.33 5 sta. 0.61–0.98 2 sta.	3 SQS ≥ 70%	All PS ≥ 70%
1984	Rotifera	7 sta.	<u>Synchaeta</u> <u>Keratella</u>	5 sta. 2 sta.	Range 20–30	1.73–2.10 7 sta.	9 SQS ≥ 70%	10 PS ≥ 70% All sta. No. 5 PS < 70%
1985**	Rotifera	all sta.	<u>Synchaeta</u>	5 sta.	Range 27–34	1.70–2.44 5 sta.	All SQS ≥ 70%	2 PS ≥ 70%

*SQS = Sorenson's Quotient of Similarity; total of 21 comparisons for each survey.
†PS = Percentage Similarity; total of 21 comparisons for each survey.
‡Sta = Stations.
§Station #4 = TRM 496.6; Station #5 = TRM 506.0; Station #6 = TRM 518.0; Station #8 = TRM 528.0; Station #9 = TRM 529.5; and Station #10 = TRM 532.1.
¶Insufficient data to run analysis.
#Samples not collected.
**Stations 7 and 8 were not sampled in 1985.

Table 5-7. Summary of ANOVA, Student-Newman-Keuls Multiple Range Tests and Regression Tests Examining Trends in Zooplankton Densities for the Seven Watts Bar Stations (Stations 4 to 10) and the Entire Chickamauga Reservoir for Winter Quarter of All Years

					Regression Analsysis (Run on Total Zooplankton only)‡			
					Watts Bar Stations Only		Watts Bar and Sequoyah Stations Combined	
Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA*	SNK† (Station Mean Ranked High to Low)	Equations for Regressions (Significant of $\alpha = 0.05$)	R^2	Equations for Regressions (Significant at $\alpha = 0.05$)	R^2
1973	Total	14.7 - 55.1	NS§	4 7 8 6 10 9 5	NS	NS	NS	NS
	Clad.	0.1 - 0.7	NS	10 8 7 6 9 5 4				
	Cope.	1.5 - 4.9	NS	10 8 7 5 6 9 4				
	Rot.	12.4 - 53.5	NS	4 7 6 8 10 9 5				
1974	Total	3.3 - 6.1	NS	7 4 5 8 10 9 6	NS	NS	NS	NS
	Clad.	0.2 - 0.4	NS	7 5 8 10 4 6 9				
	Cope.	1.0 - 1.7	NS	7 5 8 4 9 10 6				
	Rot.	2.6 - 3.9	NS	7 4 5 10 8 9 6				
1975	Total	11.1 - 22.4	NS	7 4 10 5 9 6 8	NS	NS	NS	NS
	Clad.	0.5 - 1.6	NS	7 9 10 8 6 5 4				
	Cope.	2.6 - 7.4	NS	7 4 10 9 8 5 6				
	Rot.	5.6 - 13.3	NS	4 7 5 10 6 9 8				
1976	Data for only one WBN Station.		NR¶	NR	NR	NR	$Y = 220.92 - 0.92 (X) + 0.001 (X^2)$#	0.84
1977	Total	101.4 - 190.2	NS	5 10 8 9 7 6 4	NS	NS	$Y = -45.82$ to $0.20 (X) - 0.0002 (X^2)$	0.51
	Clad.	0.5 - 1.2	NS	5 10 8 7 4 6 9				
	Cope.	8.3 - 21.6	Sign.	10 7 9 8 5 6 4				
	Rot.	92.0 - 176.4	NS	5 8 10 9 7 6 4				
1982	No samples collected.		NR	NR	NR	NR	NR	NR

Table 5-7. (Continued)

Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA*	SNK† (Station Mean Ranked High to Low)	Regression Analsysis (Run on Total Zooplankton only)‡ Watts Bar Stations Only: Equations for Regressions (Significant of α = 0.05)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regressions (Significant at α = 0.05)	R^2
1983	Total	14.8 - 26.6	NS	4 8 7 5 10 6 9	NS	NS	$Y = 31.95 - 0.10\,(X) + 0.001\,(X^2)$	0.2
	Clad.	0.3 - 1.9	NS	4 10 8 9 5 7 6				
	Cope.	0.9 - 2.1	NS	4 5 6 8 7 9 10				
	Rot.	16.8 - 22.7	NS	4 8 7 10 5 6 9				
1984	Total	7.1 - 34.6	NS	10 8 7 6 9 4 5	$Y = 181.92 - 0.70\,(X) + 0.001\,(X^2)$	0.36	$Y = 44.15 - 0.17\,(X) + 0.0002\,(X^2)$	0.4
	Clad.	0.2 - 0.9	NS	10 9 4 7 6 8 5				
	Cope.	0.9 - 6.8	Sign.	10 8 7 6 9 4 5				
	Rot.	6.0 - 26.9	NS	10 7 8 6 9 4 5				
1985	Total	20.0 - 38.1	NS	5 4 6 10 9	NS	NS	NS	NS
	Clad.	0.4 - 1.7	NS	10 6 9 4 5				
	Cope.	3.4 - 10.9	NS	4 10 5 9 6				
	Rot.	15.0 - 32.6	NS	5 6 4 10 9				

*ANOVA = One-Way Analysis of Variance.
†SNK = Student-Newman-Keuls Multiple Range Test run at α = 0.05 level.
‡Regressions were run on WBN (Watts Bar Nuclear Plant) data alone and WBN plus SQN (Sequoyah Nuclear Plant) data combined because SQN provided data from further downstream in Chickamauga Reservoir.
§NS = Not significant at α 0.05.
¶NR = Test not run.
#Only one WBN station (Station 4) was run with the three SQN stations in 1976.

Table 5-8. Summary of the Spring Zooplankton Community Data for the Seven Watts Bar Stations During this Preoperational Study

Year	Dominant Group	Dominant Taxa	Number of Taxa	Diversity Index (D Bar)	SQS	PS
1973	Cladocera (sta. 4-6) Rotifera (sta. 7-10)	*B. longirostris* 6 sta. *Polyarthra* 1 sta.	Range 21-27	1.87-2.38 6 sta. 0.96 1 sta.	All SQS ≥ 70%	6 PS ≥ 70%
1974	Rotifera (sta. 4) Cladocera (sta. 5-10)	*Conachilus* 1 sta. *B. longirostris* 6 sta.	Range 18-39	1.10-2.42 7 sta.	All but station 4 SQS ≥ 70%	3 PS ≥ 70%
1975	Cladocera (all sta.)	*B. longirostris* 7 sta.	Range 24-29	1.23-1.80 6 sta. 2.79 1 sta.	All SQS ≥ 70%	9 PS ≥ 70%
1976	Cladocera (sta. 4-9) Copepoda (sta. 10)	*B. longirostris* 6 sta. Nauplii 1 sta.	Range 23-33	1.79-2.40 6 sta. 0.89 1 sta.	All SQS ≥ 70%	5 PS ≥ 70%
1977	Rotifera (all sta.)	*Synchaeta* 4 sta. *Asplanchna* 3 sta.	Range 24-35	2.90-3.18 6 sta. 2.40 1 sta.	All SQS ≥ 70%	6 PS ≥ 70%
1982	Rotifera (sta. 4,7,8,9, and 10) Cladocera (sta. 5 and 6)	*Polyarthra* 1 station *B. longirostris* 6 stations	Range 16-28	1.87-2.81 6 sta. 0.84 1 sta.	All SQS ≥ 70%	7 PS ≥ 70%
1983	Rotifera (all sta.)	*Keratella* 7 sta.	Range 28-37	2.27-2.74 6 sta. 3.04 1 sta.	All SQS ≥ 70%	3 PS ≥ 70%
1984	Rotifera (all sta.)	*Synchaeta* 7 sta.	Range 23-34	1.83-2.60 7 sta.	All SQS ≥ 70%	4 PS ≥ 70%
1985*	Rotifera (all sta.)	*Kellicottia long.* 4 sta. *Polyarthra* 1 sta. *B. budapestinensis* 1 sta.	Range 21-39	1.38-2.56 6 sta.	7 of 14 SQS ≥ 70%	2 of 14 PS ≥ 70%

All abbreviations and explanations as in table 5-6.
*Station 8 was not collected in spring 1985.

Table 5-9. Summary of ANOVA, Student-Newman-Keuls Multiple Range Tests and Regression Tests Examining Trends in Zooplankton Densities for the Seven Watts Bar Stations (Stations 4 to 10) and the Entire Chickamauga Reservoir for Spring Quarter of all Years

Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA	SNK-(Station Mean Ranked High to Low)	Watts Bar Stations Only: Equations for Regressions (Significant at α = 0.05)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regressions (Significant at α = 0.05)	R^2
1973	Total	48.5 - 246.5	Sign.	10 8 9 7 6 5 4	$Y = 212.71 - 0.83 (X) + 0.001 (X^2)$	0.76	$Y = 165.63 - 0.64 (X) + 0.001 (X^2)$	0.64
	Clad.	24.7 - 83.0	NS	10 8 9 6 5 7 4				
	Cope.	1.5 - 23.8	Sign.	10 9 8 7 4 6 5				
	Rot.	5.5 - 139.6	Sign.	10 8 9 7 6 4 5				
1974	Total	8.4 - 121.6	Sign.	10 8 9 4 7 5 6	$Y = 688.39 - 2.67 (X) + 0.003 (X^2)$	0.70	NS	NS
	Clad.	3.9 - 57.4	Sign.	10 8 9 7 5 4 6				
	Cope.	0.6 - 17.8	Sign.	10 8 9 7 5 4 6				
	Rot.	3.1 - 46.4	Sign.	10 4 8 7 9 6 5				
1975	Total	42.7 - 138.3	Sign.	10 9 7 4 6 8 5	NS	NS	$Y = 155.56 - 0.59 (X) + 0.001 (X^2)$	0.52
	Clad.	14.7 - 92.1	Sign.	10 7 4 9 6 5 8				
	Cope.	2.0 - 25.8	Sign.	10 9 8 7 6 4 5				
	Rot.	9.3 - 20.5	NS	10 4 7 8 6 9 5				
1976	Total	66.0 - 201.5	Sign.	10 9 7 8 6 5 4	$Y = 204.55 - 0.79 (X) - 0.001 (X^2)$	0.94	$Y = 232.84 - 0.90 (X) + 0.001 (X^2)$	0.84
	Clad.	28.3 - 52.8	Sign.	9 7 8 5 4 10 6				
	Cope.	8.2 - 103.8	Sign.	10 9 8 7 6 4 5				
	Rot.	5.8 - 65.4	Sign.	10 9 7 8 6 4 5				

Table 5-9. (Continued)

				SNK-(Station	Watts Bar Stations Only		Watts Bar and Sequoyah Stations Combined	
Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA	Mean Ranked High to Low)	Equations for Regressions (Significant at α = 0.05)	R^2	Equations for Regressions (Significant at α = 0.05)	R^2
1977	Total	28.2 - 227.7	Sign.	10 9 7 8 4 6 5	$Y = 415.00 - 1.61 (X) + 0.002 (X^2)$	0.82	$Y = 245.98 - 0.96 (X) + 0.001 (X^2)$	0.63
	Clad.	8.2 - 45.0	Sign.	9 10 7 8 4 6 5				
	Cope.	1.3 - 37.0	Sign.	10 9 7 8 4 6 5				
	Rot.	17.9 - 150.3	Sign.	10 7 9 8 4 6 5				
1982	Total	105.7 - 242.7	NS	10 7 8 6 4 9 5	NS	NS	NS	NS
	Clad.	47.7 - 97.2	NS	6 5 10 4 8 7 9				
	Cope.	11.8 - 51.6	Sign.	10 9 7 8 6 4 5				
	Rot.	5.1 - 140.5	Sign.	7 8 9 10 4 6 5				
1983	Total	6.8 - 306.2	Sign.	9 8 7 6 10 5 4	$Y = 375.69 + 1.44 (X) - 0.001 (X^2)$	0.85	$Y = 471.01 - 1.84 (X) + 0.002 (X^2)$	0.51
	Clad.	0.8 - 27.8	NS	9 6 8 10 5 4 7				
	Cope.	0.5 - 13.8	NS	9 8 10 5 4 7 6				
	Rot.	5.5 - 264.7	Sign.	9 8 7 6 10 5 4				
1984	Total	8.1 - 283.0	Sign.	10 7 8 9 6 4 5	$Y = 420.61 - 1.66 (X) + 0.002 (X^2)$	0.70	$Y = 283.11 - 1.12 (X) + 0.001 (X^2)$	0.71
	Clad.	1.4 - 13.3	NS	7 10 9 8 4 5 6				
	Cope.	0.6 - 8.6	Sign.	10 9 7 8 4 5 6				
	Rot.	6.1 - 264.4	Sign.	10 7 8 9 6 4 5				
1985	Total	121.9 - 579.2	Sign.	9 7 10 4 5 6	$Y = 400.91 - 1.55 (X) + 0.002 (X^2)$	0.58	$Y = 58.94 - 0.22 (X) + 0.0002 (X^2)$	0.42
	Clad.	3.3 - 20.4	NS	10 7 9 4 5 6				
	Cope.	18.6 - 72.4	Sign.	10 9 7 4 6 5				
	Rot.	92.0 - 510.3	Sign.	9 7 4 10 5 6				

All abbreviations and explanations same as in table 5-7.

Table 5-10. Summary of the Summer Zooplankton Community Data for the Seven Watts Bar Stations During this Preoperational Study

Year	Dominant Group	Dominant Taxa	Number of Taxa	Diversity Index (d-bar)	SQS	PS
1973	Cladocera (sta. 4, 5) Rotifera (sta. 6-10)	*B. longirostris* 2 sta. *Brachionus* 3 sta. *Ploesoma* 1 sta. *Asplanchna* 1 sta.	Range 24-32	2.59-3.36 7 sta.	All SQS $\geq$ 70%	3 PS $\geq$ 70%
1974	Cladocera (sta. 5,6) Rotifera (sta. 10) Copepoda (sta. 4,7,8,9)	*B. longirostris* 3 sta. *D. retrocurva* 1 sta. Nauplii 3 sta.	Range 14-24	2.63-3.11 7 sta.	18 SQS $\geq$ 70%	2 PS $\geq$ 70%
1975	Cladocera (sta. 5,8,9) Rotifera (sta. 4,6,7,10)	*B. longirostris* 2 sta. *Keratella* 4 sta. Nauplii 1 sta.	Range 24-34	2.83-3.61 7 sta.	All SQS $\geq$ 70%	4 PS $\geq$ 70%
1976	Rotifera (all sta.)	*Keratella* 7 sta.	Range 24-33	2.23-3.49 7 sta.	All SQS $\geq$ 70%	4 PS $\geq$ 70%
1977	Rotifera (all sta.)	*B. angularis* 2 sta. Nauplii 2 sta. *Conochilus* 3 sta.	Range 26-33	2.63-3.32 7 sta.	All SQS $\geq$ 70%	6 PS $\geq$ 70%
1982	Rotifera (all sta.)	*Conochilus* 5 sta. *Brachionus* 1 sta. *Ploesoma* 1 sta.	Range 30-39	2.90-3.23 7 sta.	All SQS $\geq$ 70%	7 PS $\geq$ 70%
1983	Rotifera (all sta.)	*B. longirostris* 3 sta. Nauplii 1 sta. *Ploesoma* 2 sta. *Polyarthra* 1 sta.	Range 18-32	3.05-3.60 6 sta. 2.23 1 sta.	18 SQS $\geq$ 70%	1 PS $\geq$ 70% (only sta. 7 with 8)

Table 5-10. (Continued)

Year	Dominant Group	Dominant Taxa	Number of Taxa	Diversity Index (d-bar)	SQS	PS
1984	Rotifera (all sta.)	*B. longirostris* 2 sta. *Ploesoma* 3 sta. *Brachionus* 2 sta.	Range 29-35	3.02-3.58 7 sta.	All SQS ≥ 70%	3 PS ≥ 70%
1985	Copepoda (sta. 5,6, 7,8,9,10) Rotifera (sta. 4)	Nauplii 6 sta. *Conochilus* 1 sta.	Range 27-39	2.86-3.50 7 sta.	All SQS ≥ 70%	4 PS ≥ 70%

All abbreviations and explanations as in table 5-6.

Table 5-11. Summary of ANOVA, Student-Newman-Keuls Multiple Range Tests and Regression Tests Examining Trends in Zooplankton Densities for the Seven Watts Bar Stations (Stations 4-10) and The Entire Chickamauga Reservoir for Summer Quarter of All Years

Year	Data	Range of Densities (No. 1 x $10^3/m^3$	One-Way ANOVA	SNK-(Station Means Ranged High to Low)	Watts Bar Stations Only: Equations for Regressions (Significant at α = 0.05)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regressions (Significant at α = 0.05)	R^2
1973	Total	17.1 - 290.5	Sign	10 9 8 7 6 5 4	Y = 147.11 - 0.59 (X) + 0.001 (X^2)	0.88	Y = 204.25 - 0.81 (X) + 0.001 (X^2)	0.89
	Clad.	8.3 - 51.9	Sign	10 9 8 5 7 4 6				
	Cope.	2.4 - 28.4	Sign	9 10 8 7 6 5 4				
	Rot.	6.5 - 211.2	Sign	10 9 8 7 6 5 4				
1974	Total	7.4 - 58.3	Sign	10 8 9 7 6 4 5	Y = 213.05 - 0.83 (X) + 0.001 (X^2)	0.89	Y = 241.73 - 0.94 (X) + 0.001 (X^2)	0.78
	Clad.	3.5 - 19.3	Sign	10 8 6 9 7 5 4				
	Cope.	3.0 - 18.2	Sign	10 9 8 7 6 4 5				
	Rot.	0.3 - 21.0	Sign	10 4 8 9 7 6 5				
1975	Total	16.7 - 169.0	Sign	10 7 9 8 5 6 4	Y = 375.56 - 1.47 (X) + 0.001 (X^2)	0.87	Y = 273.82 - 1.07 (X) + 0.001 (X^2)	0.65
	Clad.	5.1 - 46.8	Sign	10 7 8 9 5 6 4				
	Cope.	3.6 - 26.0	Sign	10 9 7 8 6 4 5				
	Rot.	7.0 - 96.2	Sign	10 7 8 9 4 5 6				

Table 5-11. (Continued)

Year	Data	Range of Densities (No. 1 x $10^3/m^3$	One-Way ANOVA	SNK-(Station Means Ranged High to Low)	Watts Bar Stations Only: Equations for Regressions (Significant at α = 0.05)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regressions (Significant at α = 0.05)	R^2
1976	Total	33.9 - 316.0	Sign	7 8 10 6 9 5 4	Y = 102.98 + 0.40 (X) - 0.0004 (X^2)	0.77	Y = 226.48 - 0.88 + 0.001 (X^2)	0.64
	Clad.	6.4 - 34.5	Sign	7 8 9 6 10 5 4				
	Cope.	7.1 - 25.6	Sign	8 7 10 6 9 5 4				
	Rot.	20.4 - 256.0	Sign	7 8 10 6 9 5 4				
1977	Total	25.6 - 170.1	Sign	10 7 8 9 5 6 4	Y = 246.04 - 0.96 (X) + 0.001 (X^2)	0.77	Y = 326.69 - 1.27 (X) + 0.001 (X^2)	0.81
	Clad.	2.7 - 19.7	Sign	7 9 8 10 5 6 4				
	Cope.	7.1 - 20.0	NS	7 10 8 9 5 6 4				
	Rot.	12.8 - 137.5	Sign	10 7 9 8 4 5 6				
1982	Total	11.7 - 88.6	Sign	7 9 8 10 4 6 5	Y = 298.90 - 1.16 (X) + 0.001 (X^2)	0.52	Y = 258.51 - 1.00 (X) + 0.001 (X^2)	0.58
	Clad.	3.8 - 8.5	NS	7 9 8 10 4 6 5				
	Cope.	2.1 - 9.9	Sign	9 8 7 10 6 4 5				
	Rot.	5.8 - 71.6	Sign	7 9 8 10 4 6 5				
1983	Total	23.7 - 103.4	NS	8 10 7 9 6 5 4	Y = 41.55 - 0.16 (X) + 0.0002 (X^2)	0.40	Y = 143.39 - 0.55 (X) + 0.001 (X^2)	0.23
	Clad.	7.7 - 17.2	NS	9 5 7 8 6 10 4				
	Cope.	3.0 - 21.7	Sign	9 8 7 10 6 4 5				
	Rot.	8.9 - 74.8	Sign	10 8 7 6 9 4 5				

Table 5-11. (Continued)

Year	Data	Range of Densities (No. 1 x $10^3/m^3$)	One-Way ANOVA	SNK-(Station Means Ranged High to Low)	Watts Bar Stations Only: Equations for Regressions (Significant at $\alpha = 0.05$)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regressions (Significant at $\alpha = 0.05$)	R^2
1984	Total	20.2 - 94.0	NS	10 8 7 6 9 5 4	$Y = 29.97 - 0.12\ (X) + 0.0001\ (X^2)$	0.34	$Y = 134.45 - 0.52\ (X) + 0.001\ (X^2)$	0.42
	Clad.	2.8 - 10.3	NS	10 5 7 8 4 6 9				
	Cope.	2.0 - 23.3	Sign	10 8 7 9 5 4 6				
	Rot.	11.4 - 72.7	NS	10 8 7 6 9 5 4				
1985	Total	28.6 - 186.0	Sign	9 10 4 8 7 6 5	$Y = 576.36 - 2.23\ (X) + 0.002\ (X^2)$	0.67	$Y = 144.58 - 0.55\ (X) + 0.001\ (X^2)$	0.25
	Clad.	11.4 - 60.1	Sign	9 10 8 4 7 6 5				
	Cope.	12.2 - 80.4	Sign	9 10 8 7 4 6 5				
	Rot.	5.0 - 45.5	Sign	4 9 10 8 7 6 5				

All abbreviations and explanations same as in table 5-7.

Table 5-12. Summary of the Fall Zooplankton Community Data for the Seven Watts Bar Stations During this Preoperational Study

Year	Dominant Group	Dominant Taxa	Number of Taxa	Diversity Index (d-bar)	SQS	PS
1973	Cladocera (Sta. 4-8) Copepoda (Sta. 9) Rotifera (Sta. 10)	B. longirostris 5 sta. Keratella 2 sta.	Range 20-28	2.59-3.36 7 sta.	All SQS $\geq$ 70%	3 PS $\geq$ 70%
1974	Rotifera (all sta.)	B. longirostris 2 sta. Keratella 5 sta.	Range 18-29	1.68-2.44 7 sta.	16 SQS $\geq$ 70%	4 PS $\geq$ 70%
1975	Rotifera (all sta.)	Synchaeta 1 sta. Keratella 6 sta.	Range 24-34	2.17-2.47 6 sta. 3.25 1 sta.	20 SQS $\geq$ 70% (only sta. 4 with 7 < 70%)	4 PS $\geq$ 70%
1976	Rotifera (all sta.)	Keratella 7 sta.	Range 22-32	1.85-2.14 7 sta.	15 SQS $\geq$ 70% (most sta. 4 SQS < 70%)	7 PS $\geq$ 70%
1977	Rotifera (all sta.)	Keratella 6 sta. Synchaeta 1 sta.	Range 23-31	1.56-2.72 7 sta.	All SQS $\geq$ 70%	3 PS $\geq$ 70%
1982	Cladocera (Sta. 4-6) Rotifera (Sta. 7-10)	B. longirostris 4 sta. Synchaeta 1 sta. Keratella 2 sta.	Range 18-28	2.28-2.58 5 sta. 0.87-1.18 2 sta.	12 SQS $\geq$ 70% (most sta. 4 SQS < 70%)	6 PS $\geq$ 70%
1983	Cladocera (Sta. 4-6) Rotifera (Sta. 7-10)	B. longirostris 7 sta.	Range 16-35	2.20-2.62 4 sta. 0.68-1.71 3 sta.	15 SQS $\geq$ 70% (most sta. 5 SQS < 70%)	1 PS $\geq$ 70% (only sta. 4 with 5)
1984	Cladocera (all sta.)	B. longirostris 7 sta.	Range 19-25	1.42-1.74 2 sta. 0.77-1.21 5 sta.	14 SQS $\geq$ 70%† (most sta. 4 SQS <70%)	5 PS $\geq$ 70%
1985	Copepoda (sta. 5) Rotifera (all other sta.)	Keratella 7 sta.	Range 21-32	1.66-2.68 7 sta.	17 SQS $\geq$ 70%† (most sta. 4 SQS <70%)	2 PS $\geq$ 70% (only sta. 4 with 5 and sta. 9 with 10)

All abbreviations and explanations as in table 5-6.

Table 5-13. Summary of ANOVA, Student-Newman-Keuls Multiple Range Tests and Regression Tests Examining Trends in Zooplankton Densities for the Seven Watts Bar Stations (Stations 4 to 10) and the Entire Chickamauga Reservoir for Fall Quarter of All Years

Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA	SNK-(Station Means Ranged High to Low)	Watts Bar Stations Only: Equations for Regression (Significant at $\alpha = 0.05$)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regression (Significant at $\alpha = 0.05$)	R^2
1973	Total	1.9 - 35.9	Sign.	10 9 8 7 6 4 5	$Y = 477.12 - 1.87 (X) + 0.002 (X^2)$	0.94	$Y = 263.26 - 1.04 (X) + 0.001 (X^2)$	0.90
	Clad.	2.9 - 23.6	Sign.	10 8 9 7 6 5 4				
	Cope.	0.3 - 8.0	Sign.	10 9 8 7 6 4 5				
	Rot.	0.6 - 19.1	Sign.	10 9 8 7 6 4 5				
1974	Total	7.8 - 98.7	Sign.	10 9 8 7 6 4 5	$Y = 441.04 - 1.73 (X) + 0.002 (X^2)$	0.94	$Y = 179.56 - 0.71 (X) + 0.001 (X^2)$	0.89
	Clad.	2.9 - 23.6	Sign.	10 9 8 7 5 6 4				
	Cope.	0.4 - 18.7	Sign.	10 9 8 4 7 5 6				
	Rot.	3.9 - 56.4	Sign.	10 9 8 7 6 4 5				
1975	Total	5.9 - 118.0	Sign.	10 9 8 7 4 6 5	$Y = 619.85 - 2.43 (X) = 0.002 (S^2)$	0.98	$Y = 275.59 - 1.08 (X) = 0.001 (X^2)$	0.67
	Clad.	1.1 - 15.7	Sign.	10 9 8 7 6 4 5				
	Cope.	2.0 - 29.6	Sign.	9 10 8 7 4 6 5				
	Rot.	2.8 - 77.3	Sign.	10 9 8 7 4 6 5				
1976	Total	6.3 - 74.1	Sign.	10 9 8 7 6 5 4	$Y = 120.84 - 0.48 (X) + 0.001 (X^2)$	0.93	$Y = 201.22 - 0.79 (X) + 0.001 (X^2)$	0.89
	Clad.	1.6 - 5.7	Sign.	10 7 9 8 6 5 4				
	Cope.	0.4 - 16.0	Sign.	10 9 8 7 6 4 5				
	Rot.	4.0 - 52.4	Sign.	10 9 7 8 6 5 4				

Table 5-13. (Continued)

Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA	SNK-(Station Means Ranged High to Low)	Watts Bar Stations Only: Equations for Regression (Significant at α = 0.05)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regression (Significant at α = 0.05)	R^2
1977	Total	4.1 - 284.3	Sign.	9 10 8 7 6 5 4	Y = 186.92 - 0.75 (X) = 0.001 (X^2)	0.80	Y = 176.29 - 0.70 (X) = 0.001 (X^2)	0.55
	Clad	0.4 - 7.3		9 7 8 10 4 6 5				
	Cope.	0.7 - 30.6	Sign.	4 10 8 7 6 5 4				
	Rot.	3.0 - 246.4	Sign.	9 10 8 7 6 5 4				
1982	Total	2.8 - 27.1	Sign.	9 10 8 7 6 4 5	Y = 403.51 - 1.58 (X) + 0.002 (X^2)	0.76	Y = 266.95 - 1.05 (X) + 0.001 (X^2)	0.74
	Clad.	1.9 - 5.7	N.S.	9 7 8 10 4 6 5				
	Cope.	0.3 - 6.9	Sign.	4 10 8 7 6 4 5				
	Rot.	0.2 - 15.1	Sign.	10 9 8 7 6 4 5				
1983	Total	5.2 - 86.3	Sign.	9 8 7 10 6 4 5	Y = 283.76 - 1.11 (X) + 0.001 (X^2)	0.52	Y = 132.57 - 0.52 (X) + 0.001 (X^2)	0.55
	Clad.	4.4 - 32.9	Sign.	9 8 7 4 6 10 5				
	Cope.	0.4 - 17.1	Sign.	9 10 8 7 6 4 5				
	Rot.	0.4 - 36.3	Sign.	9 8 7 10 6 4 5				
1984	Total	2.1 - 36.3	Sign.	10 8 7 9 6 5 4	Y = 91.04 - 0.37 (X) + 0.0004 (X^2)	0.79	Y = 182.17 - 0.73 (X) + 0.001 (X^2)	0.80
	Clad.	1.3 - 17.9	Sign.	8 10 7 9 6 5 4				
	Cope.	0.5 - 14.2	Sign.	10 8 9 7 6 5 4				
	Rot.	0.3 - 4.7	Sign.	8 10 7 9 4 5 6				

Table 5-13. (Continued)

Year	Data	Range of Densities (No. x $10^3/m^3$)	One-Way ANOVA	SNK-(Station Means Ranged High to Low)	Watts Bar Stations Only: Equations for Regression (Significant at $\alpha = 0.05$)	R^2	Watts Bar and Sequoyah Stations Combined: Equations for Regression (Significant at $\alpha = 0.05$)	R^2
1985	Total	7.3 - 173.2	Sign.	10 9 7 8 6 4 5	$Y = 503.32 - 1.98 (X) + 0.002 (X^2)$	0.93	*	
	Clad.	0.8 - 17.8	Sign.	10 9 8 7 4 5 6				
	Cope.	2.4 - 62.9	Sign.	10 9 7 8 5 6 4				
	Rot.	2.5 - 92.5	Sign.	10 9 7 8 6 4 5				

*SQN stations not sampled in Fall 1985.
All abbreviations and explanations as in table 5-7.

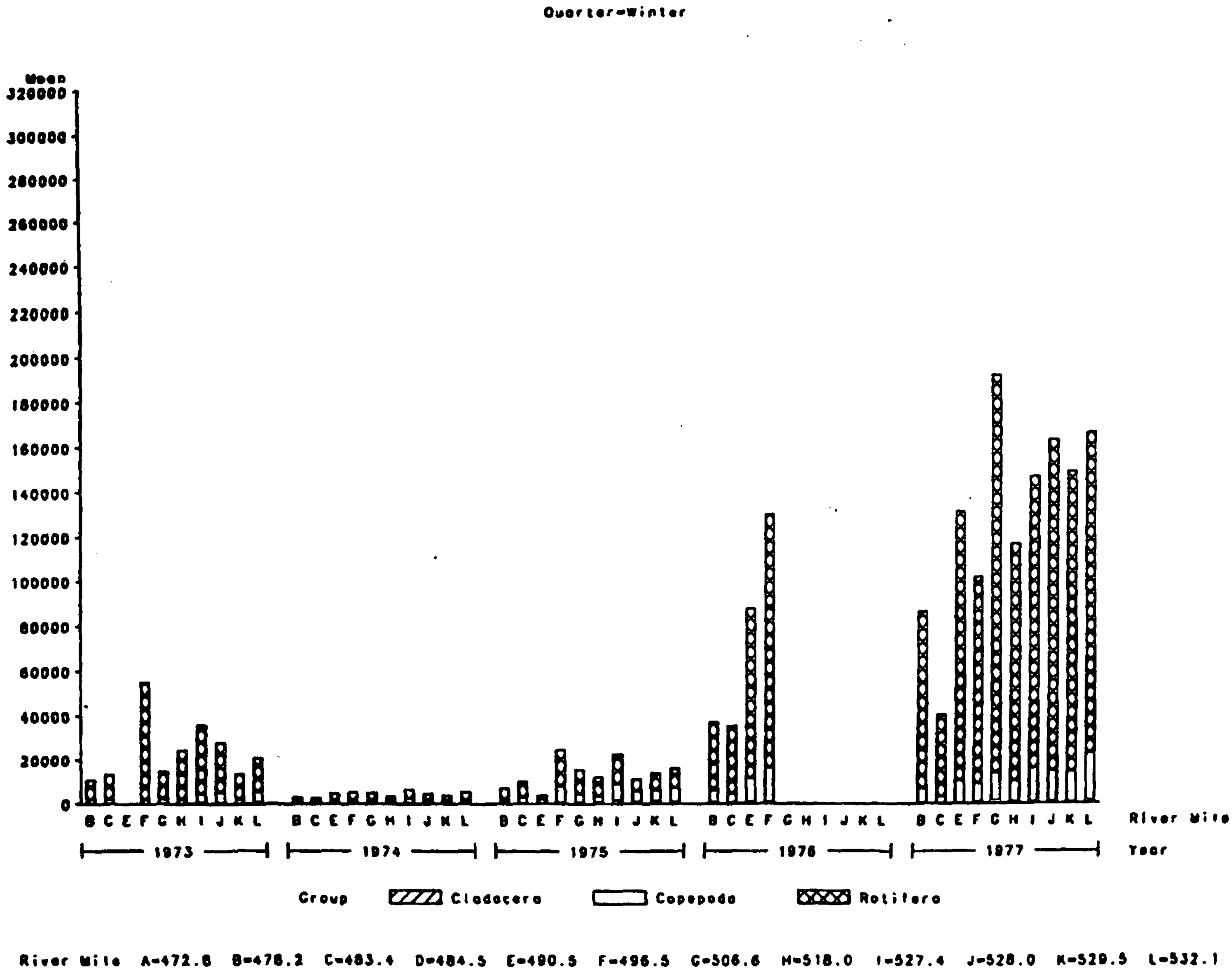
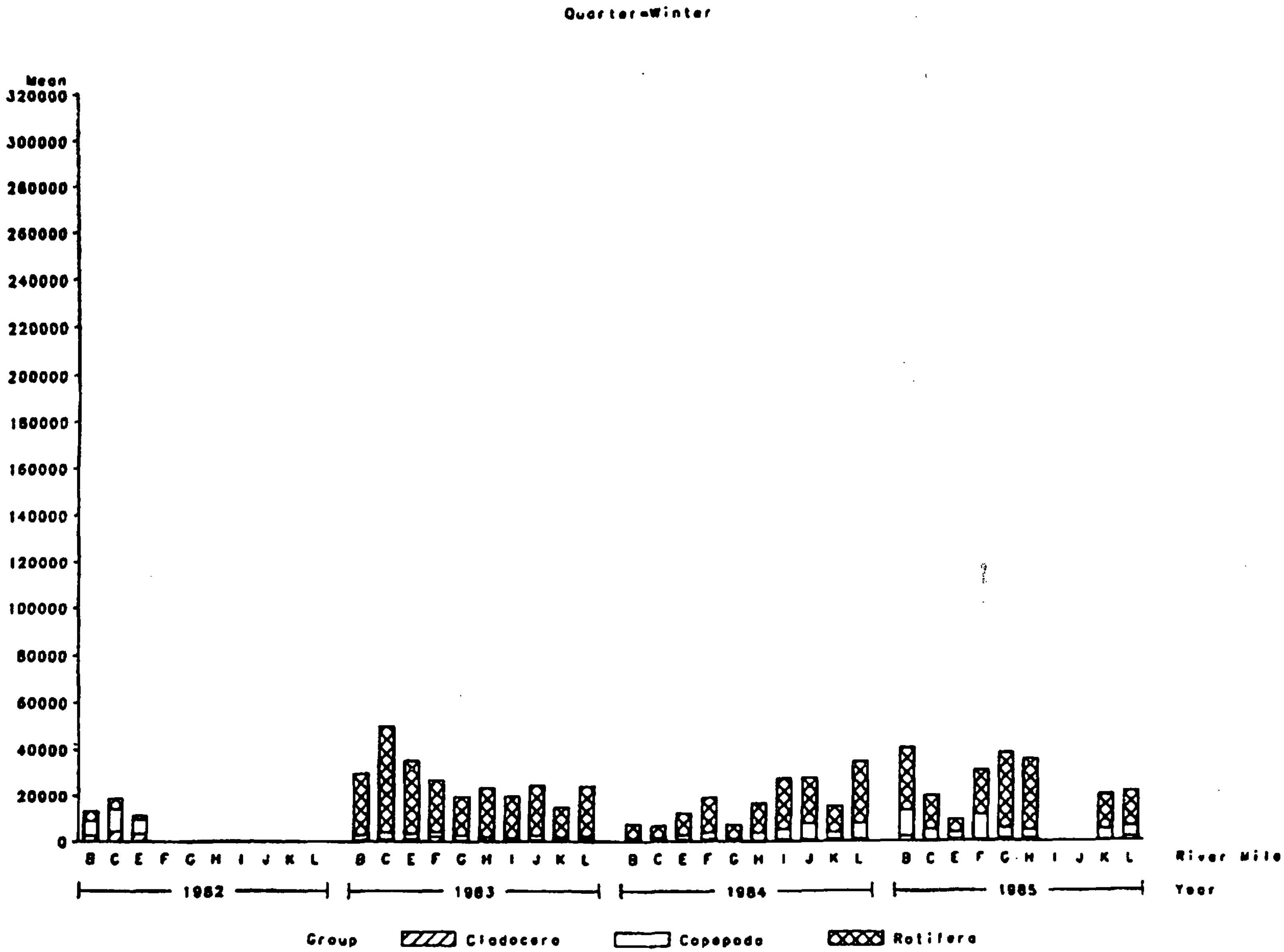
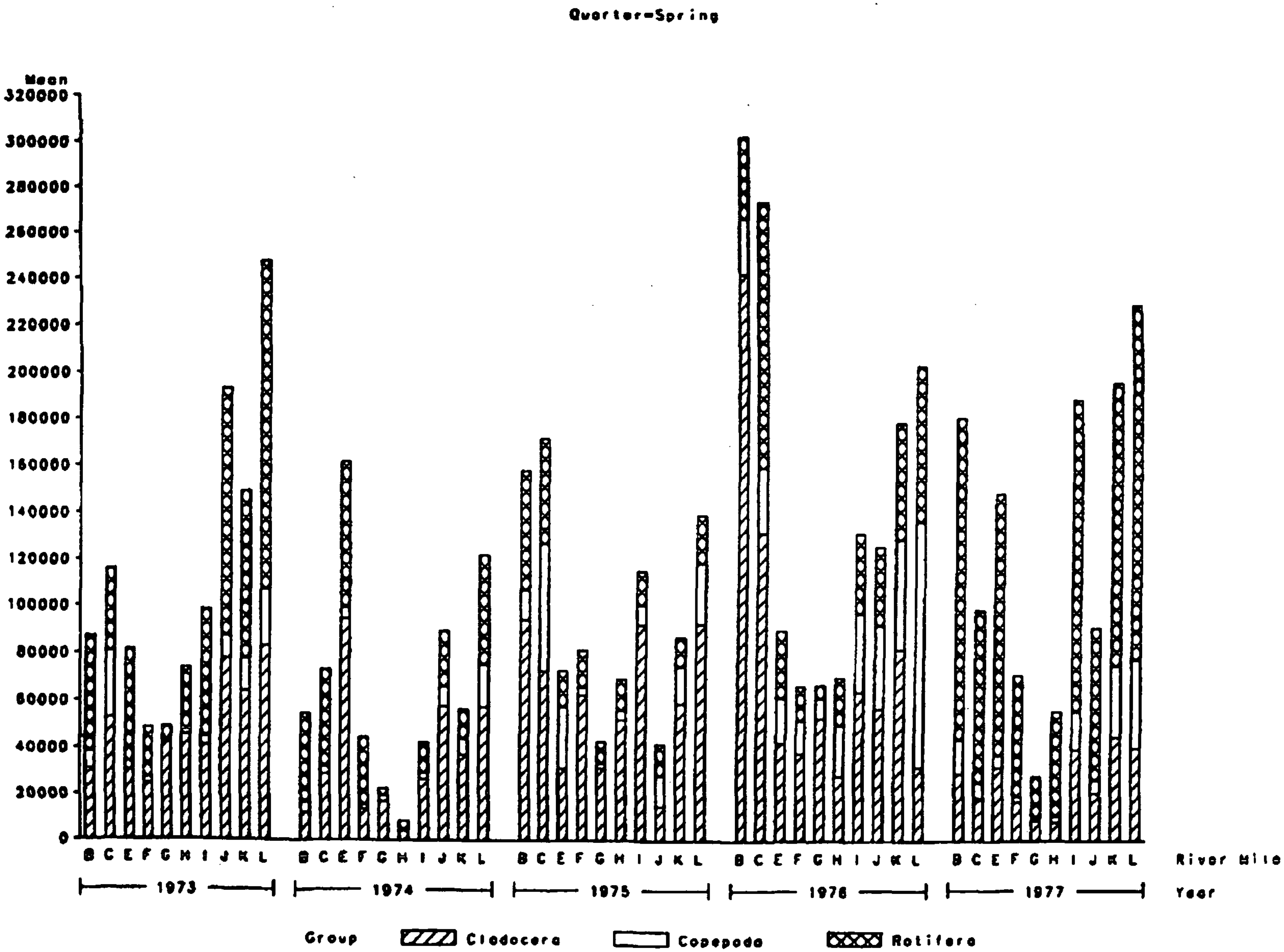


Figure 5-18. Zooplankton Abundance (No./m^3) for Winter Sample Periods during Preoperational Monitoring at Watts Bar Nuclear Plant. Proportion of Total Comprised by Each Group Shown for Each Location.



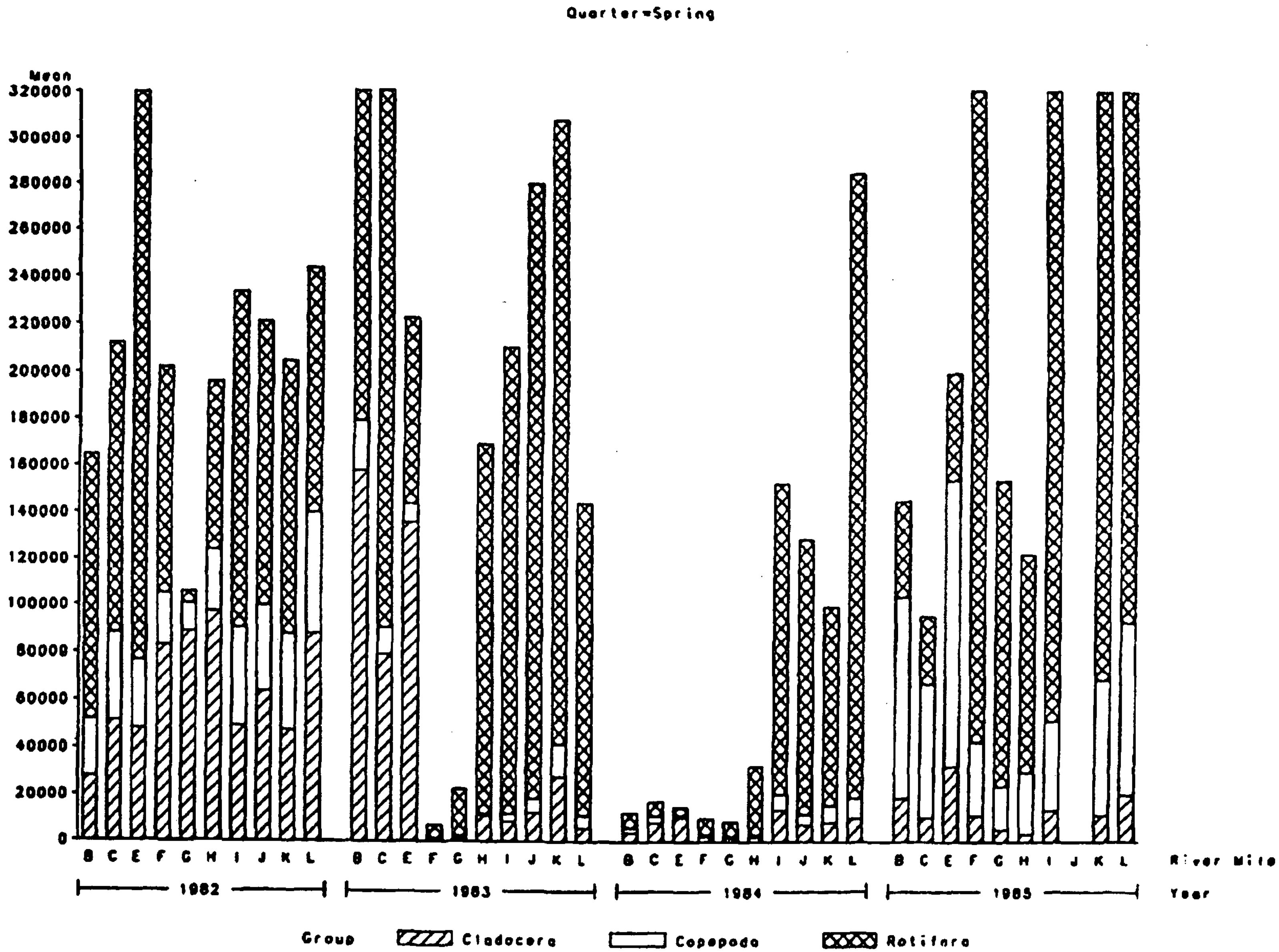
River Mile A=472.8 B=478.2 C=483.4 D=484.5 E=490.5 F=496.5 G=508.6 H=518.0 I=527.4 J=528.0 K=529.5 L=532.1

Figure 5-18. (Continued)



River Mile A=472.8 B=478.2 C=483.4 D=484.5 E=490.5 F=496.5 G=506.6 H=518.0 I=527.4 J=528.0 K=529.5 L=532.1

Figure 5-19. Zooplankton Abundance (No./m^3) for Spring Sample Periods during Preoperational Monitoring at Watts Bar Nuclear Plant. Proportion of Total Comprised by Each Group Shown for Each Location.



River Mile A=472.8 B=478.2 C=483.4 D=484.5 E=490.5 F=496.5 G=506.6 H=518.0 I=527.4 J=528.0 K=529.5 L=532.1

Figure 5-19. (Continued)

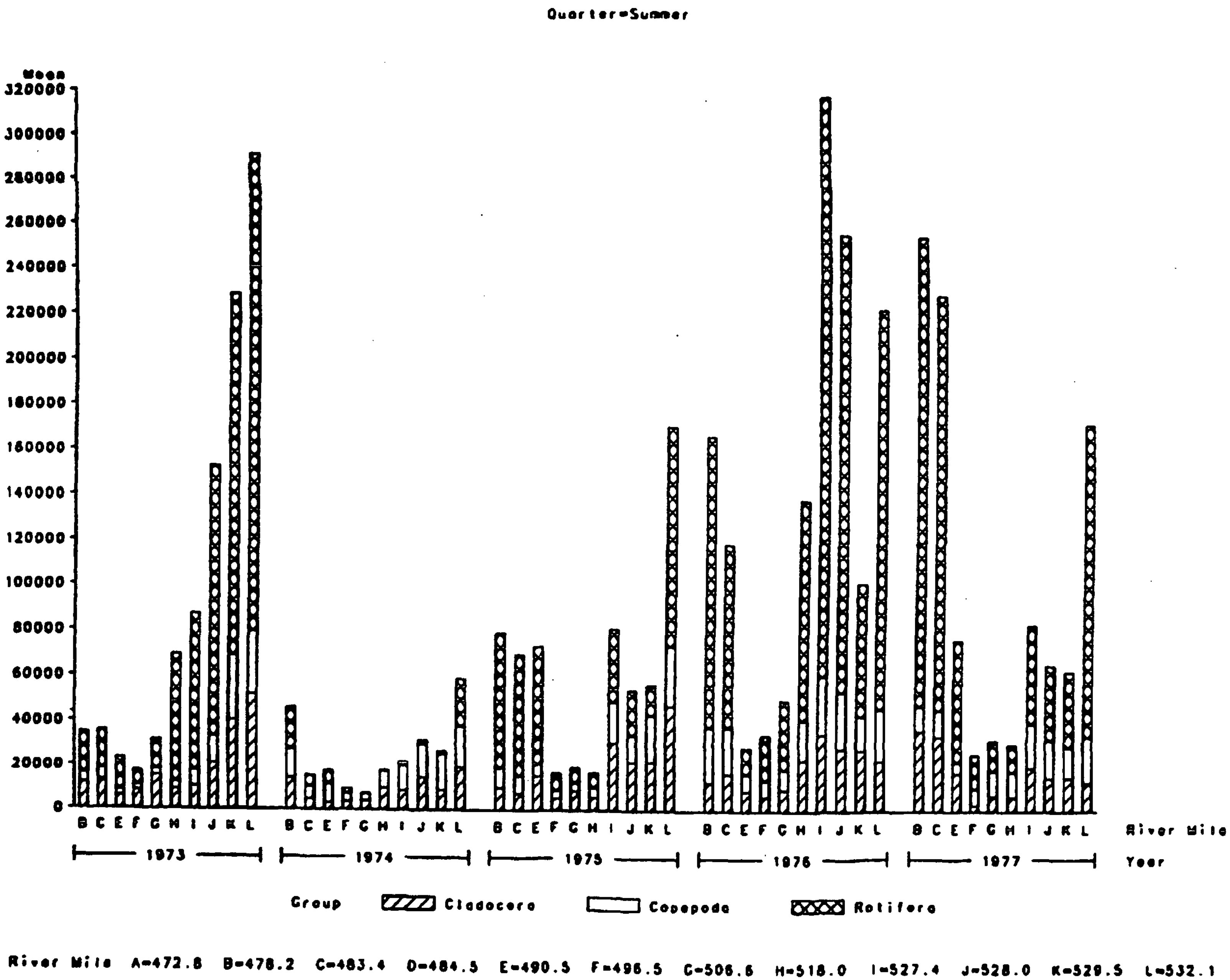


Figure 5-20. Zooplankton Abundance (No./m^3) for Summer Sample Periods during Preoperational Monitoring at Watts Bar Nuclear Plant. Proportion of Total Comprised by Each Group Shown for Each Location.

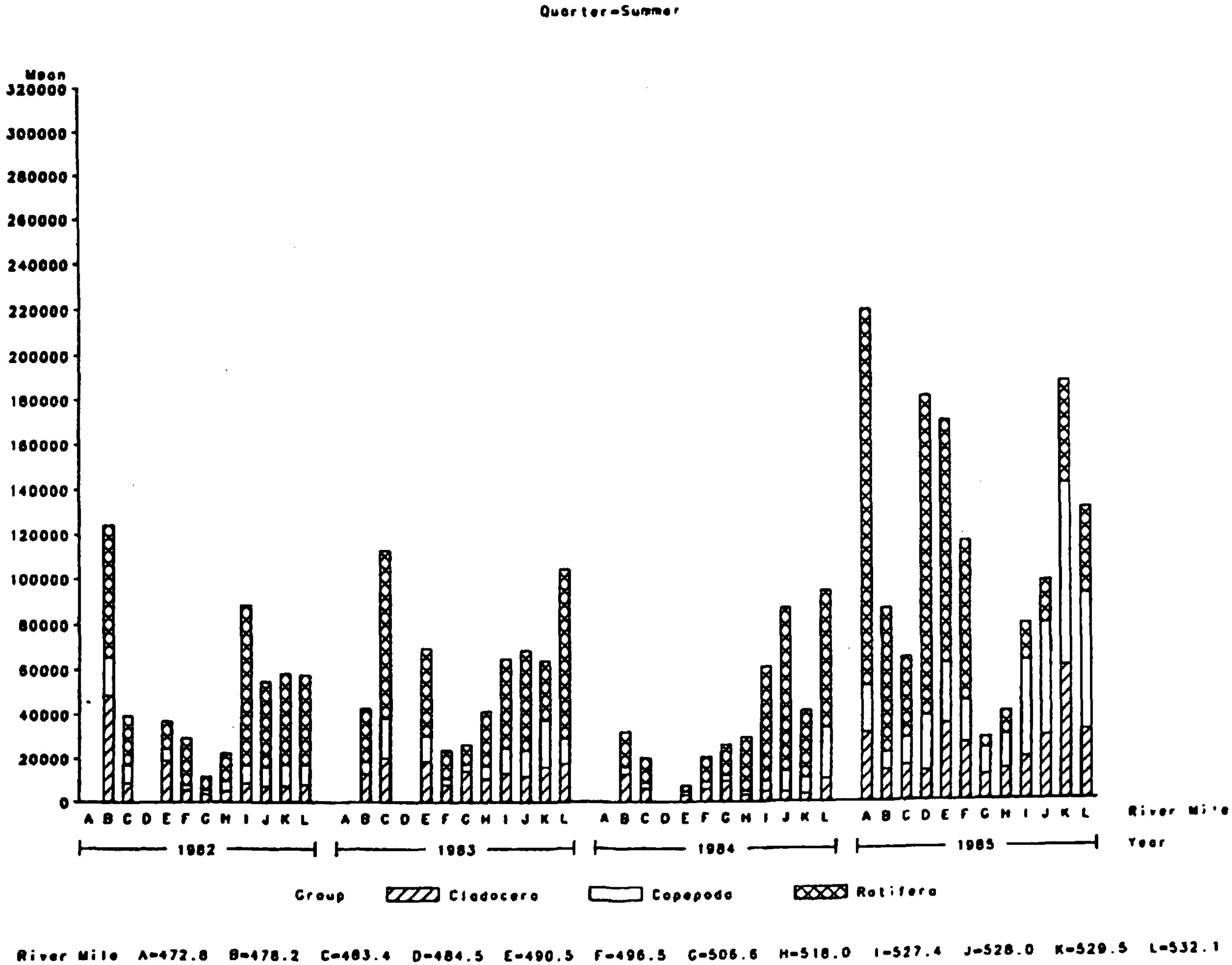


Figure 5-20. (Continued)

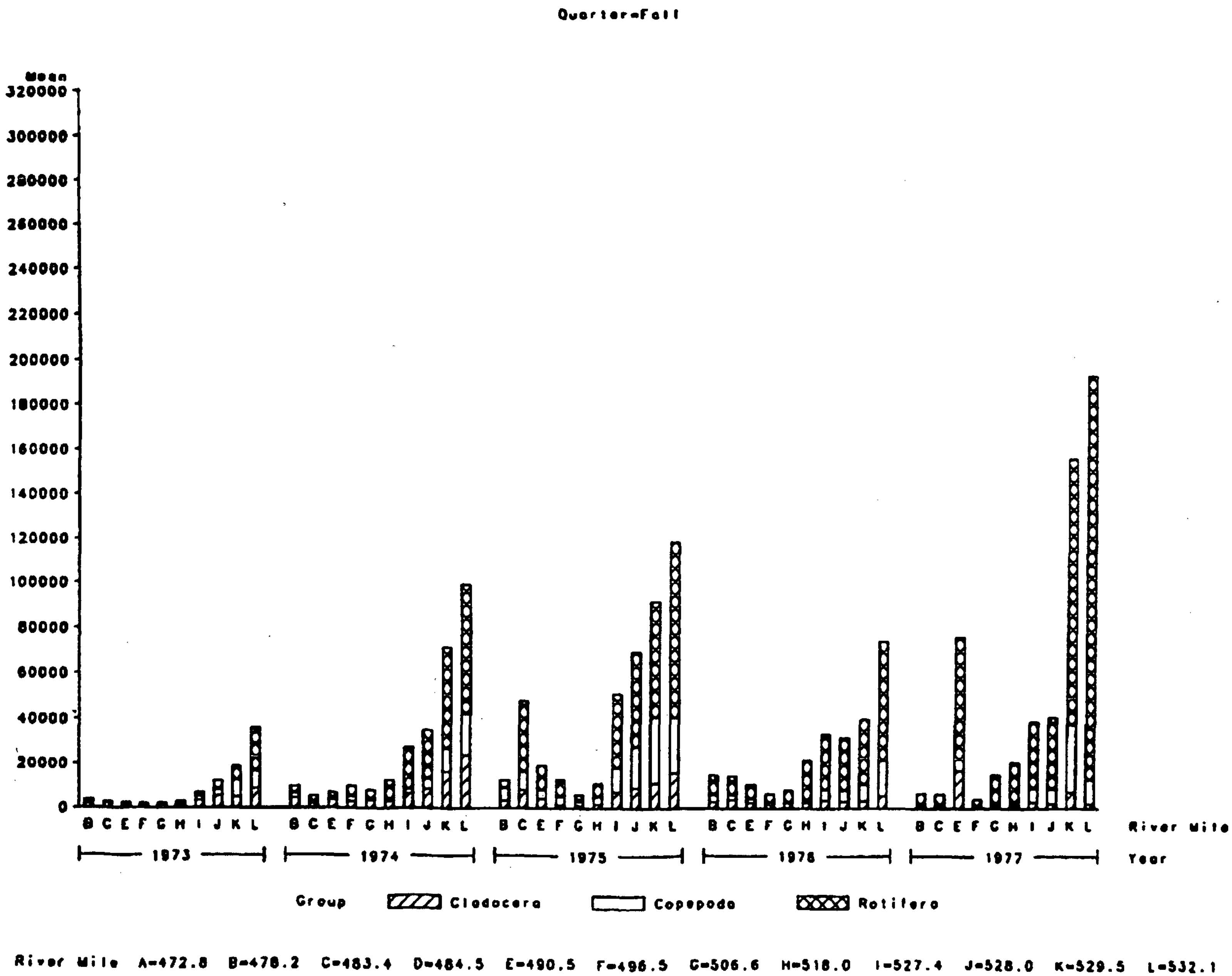
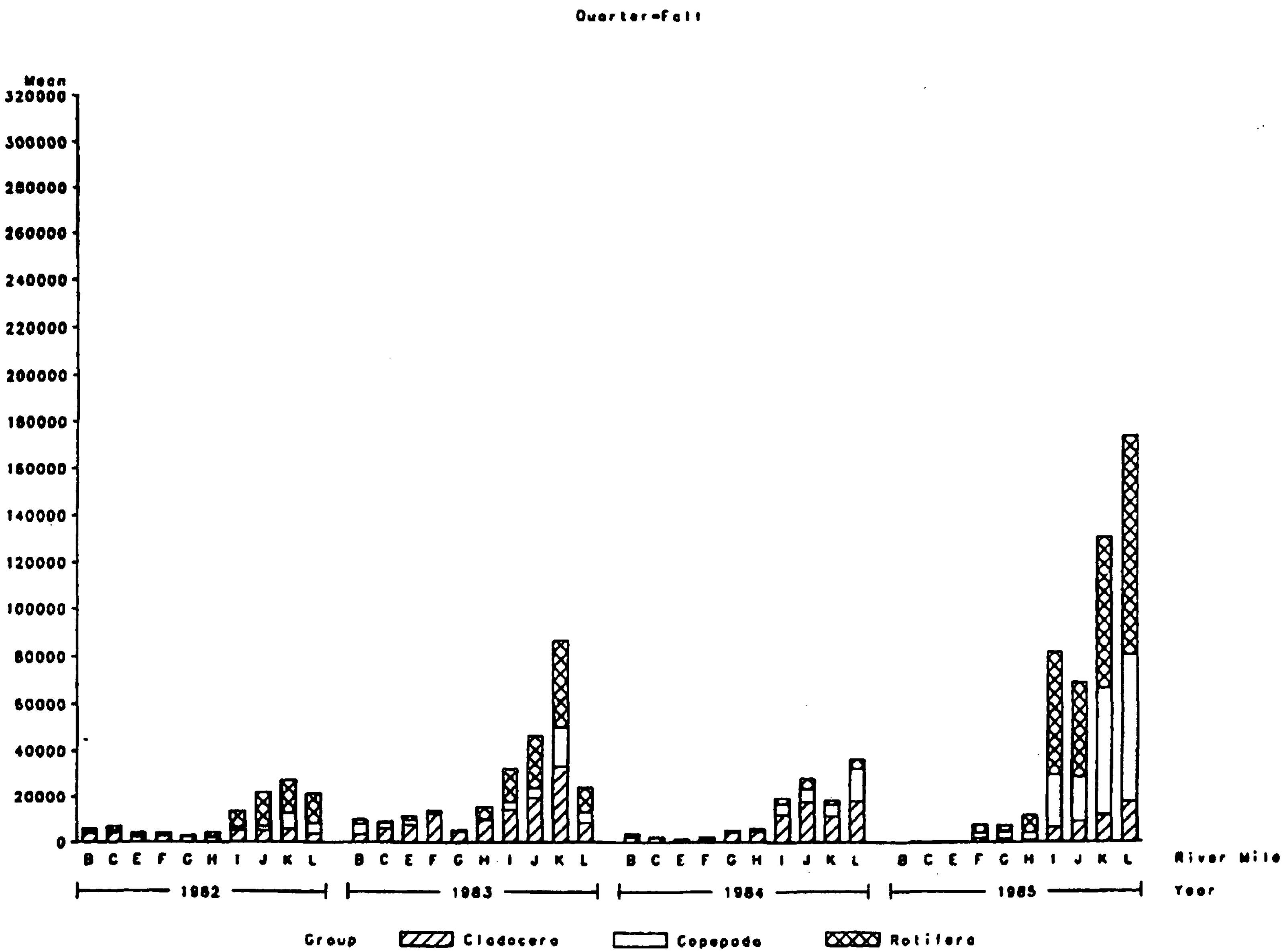


Figure 5-21. Zooplankton Abundance (No./m^3) for Fall Sample Periods during Preoperational Monitoring at Watts Bar Nuclear Plant. Proportion of Total Comprised by Each Group Shown for Each Location.



River Mile A=472.8 B=478.2 C=483.4 D=484.5 E=490.5 F=496.5 G=506.6 H=518.0 I=527.4 J=528.0 K=529.5 L=532.1

Figure 5-21. (Continued)

6.0 PERIPHYTON

Periphyton is most commonly defined as the community of bacteria, fungi, algae, and animals, as well as organic and inorganic detritus attached to submerged substrate, with the substrate being inorganic, organic, alive or dead (Weitzel 1979). It includes additionally, free living microorganisms which swim or become entangled among the attached forms. However, for this study only the algal portion of that community was considered.

Plankton, transported by flow and currents, often does not respond entirely to pertubations in the environment for a considerable distance downstream. Periphyton, on the other hand, being attached can show immediate responses to these perturbations at the source and thus can be a useful indicator of water quality.

Periphyton taxa are somewhat selective to substrate type. To avoid introducing the variable of differing substrata, artificial substrates were used to provide uniform substrate type, orientation, and size.

6.1 Materials and Methods

Field--Preoperational monitoring of the periphyton community in the vicinity of Watts Bar Nuclear Plant (WBN) was conducted from 1973 to 1977, discontinued, then resumed in 1982 continuing through 1985. Stations sampled in May/June and August/September from 1973 through 1976 were TRMs 506.6, 518.0, 527.4, 528.0, and 529.5. An additional station was added in 1977 at TRM 496.5 and the schedule was extended to include a sampling in December 1977. When the preoperational monitoring resumed in 1982, sampling was on a quarterly basis at all six river miles sampled previously.

Artificial substrates for periphyton colonization, five plexiglass plates (1.5 dm^2 exposed area), were placed in a metal or PVC support rack and suspended 0.5 m from the water surface. Two racks were placed at each sampling location throughout the 1973-1985 study period. The plates were collected after being incubated for approximately one month. Upon collection, each plate was placed in an individual plastic bag and labelled. From 1973 to 1977, one plate from each rack was designated for algal enumeration (ID) and the remaining plates were designated for autotrophic index (AI) analysis. Beginning in 1982, three of ten slides incubated were selected at random for ID; the remaining slides were used for AI analyses. After labelling, all plates were placed on ice, returned to the laboratory, and stored frozen.

Enumeration--Plates designated for algal enumeration were thawed for up to one hour before periphyton was scraped from the plates. If the periphytic growth was moderate to heavy, a small area (usually 25 cm^2) was scraped. If the growth was light to moderate, the entire plate was scraped into a beaker containing a small amount of 10 percent formalin.

The scraped materials were diluted and a subsample withdrawn. Volumes of the diluted sample and the subsample were dependent upon the abundance of organisms and the quantity of detritus. The subsample was placed in a sedimentation chamber, similar to an Uthermohl cylinder, and allowed to settle for at least 12 hours. Classification and enumeration were conducted at the generic level with an inverted microscope at a magnification of approximately 320X. References and publications used in identification varied for individual algal groups. Sometimes several references were utilized to identify genera within an algal group, but usually a single reference comprised the major taxonomic authority. Major (x) and infrequently (✓) used references were as follows:

	Algal Group					
Reference	Chloro	Chryso	Cyano	Crypto	Eugleno	Pyrrho
Cocke (1967)			x			
Desikachary (1959)			✓			
Drouet (1973)			x			
Drouet & Daily (1973)			x			
Forest (1954)	✓	✓	✓		x	✓
Hustedt (1930)		x				
Patrick & Reimer (1966)		x				
Prescott (1964)	x			x	x	x
Tiffany & Britton (1971)	✓	✓			✓	✓
Whitford & Schumacher (1969)	✓					

Autotrophic Index--Slides selected for autotrophic indices were thawed and large invertebrates (chironomids, caddisflies, etc.) were removed. All periphytic growth was scraped from the slide and placed in a solvent to extract the phytopigments. The scraped material was placed in solvent, homogenized, and steeped for at least 12 hours. In 1973 through 1975, the solvent used for extraction was 95 percent ethanol and the instrument used to determine phytopigment densities was a Klett-Summerson colorimeter. After 1975, the phytopigments were extracted using 90 percent alkalized acetone and a Beckman Model 25 spectrophotometer was used to determine pigment concentrations.

After extraction the sample was filtered onto a preweighed filter pad. Chlorophyll concentrations were determined using the filtrate as described below. Biomass estimate was calculated using data from the residue manipulations. The filter with residue was placed in a preweighed crucible and dried at 105°C for at least 12 hours; weighed, then incinerated in a muffle furnace at 600°C for 1 hour; cooled in a dessicator; and reweighed. This ash-free dry weight provided an estimate of total organic matter or biomass.

To estimate phytopigment concentrations, the filtrate was analyzed photometrically with a Klett-Summerson colorimeter in 1973 to 1975. With the ash-free dry weight, the autotrophic index was calculated as shown:

$$AI = \frac{(\text{Klett-Summerson reading})(0.002)}{\text{Ash-free dry weight/slide}}$$

Because of the unreliability of the phytopigment readings obtained from the Klett-Summerson colorimeter and the inability to compare the data to later years, the 1973 autotrophic indices are not included in this report. The 1974 and 1975 phytopigment samples were destroyed in a laboratory accident.

After 1975, the filtrate was analyzed spectrophotometrically. From 1976 to 1977, the optical densities were read at 750, 663, 645, and 630 nm. Each sample was then acidified with two drops of 0.1 N HCl, allowed to steep for one minute, then reread at 750 and 663 nm. Chlorophyll a, b, and c concentrations were originally calculated using the 1966 UNESCO equations for chlorophylls and the Lorenzen (1967) equations for phaeophytin a. However, for this report all values have been recalculated using the Jeffrey-Humphrey (1975) equations.

In 1982 through 1985, optical densities of each sample were read at 750, 664, 647, and 630 nm. Again the samples were acidified with two drops of 0.1 N HCl, allowed to steep for one minute, then reread at 750 and 664 nm. Phytopigment concentrations were calculated using the Jeffrey-Humphrey (1975) equations, and phaeophytin a concentration was calculated again using the Lorenzen (1967) equations.

For all samples from 1976 to 1985, the phaeophytin index values were determined (Weber 1973) as shown:

$$PI = \text{Chl } \underline{a}_b / \text{Chl } \underline{a}_a$$

where Chl $\underline{a}_a$ = corrected optical density for chlorophyll a after acidification;

Chl $\underline{a}_b$ = corrected optical density for chlorophyll a before acidification.

The autotrophic index (AI) value for the sample was calculated according to Weber (1973) as shown:

$$AI = \frac{\text{Ash free dry weight/m}^2 \text{ (mg/m}^2)}{\text{Chlorophyll } \underline{a} \text{ concentration/m}^2 \text{ (mg/m}^2)}$$

Data Analyses--Periphyton enumeration and autotrophic index data for each sampling date were tested for station differences using a one-way Analysis of Variance after the data were transformed ($\log_{10} + 1$). If there were significant differences among stations, a Student, Newman, Keuls (SNK) Multiple Range Test (Sokal and Rohlf, 1969) was applied to the data. However, this was done only for those sampling dates which had replicate samples for every station.

To examine trends in the enumeration data, the data were transformed ($\log_{10} + 1$) and pooled by years and by stations. Two-way analyses of variance were done on these pooled data sets with station and time (both year and month) as the variables. Means were further compared using an SNK multiple range test. When cyanophytes were not found at all stations for which substrates were recovered, the station which had no cyanophytes in any replicate substrate was dropped from the analyses. This was done to avoid distorting the ANOVA with "no variance" data.

Similarity of periphytic communities among stations was determined using a two-step approach. Sorenson's Quotient of Similarity, SQS (McCain, 1975), was calculated to determine similarities based solely on presence/absence of genera (qualitative characteristics of community composition). A percentage similarity (PS) index (Pielou, 1975) was calculated, but was based on both qualitative and quantitative characteristics of community structure. In both cases, values of 70 percent or greater were assumed to show similarity.

SQS was calculated as follows:

$$SQS = [2s/(x + y)](100)$$

where, x = number of taxa at station x

y = number of taxa at station y

s = number of taxa in common between stations x and y

Percentage similarity index was calculated as follows:

$$PS = 200\Sigma_{i=1}^{s} \min P_{iX}, P_{iY})$$

where, P_{iX} and P_{iY} are the quantities of genus i at stations X and Y as proportions of the quantities of all s genera at the two stations combined.

If comparisons between two locations provided low SQS and PS values, the communities were considered different. If SQS was high but PS low, communities were composed of similar genera but differed either in absolute cell density or in relative abundance of genera present. When SQS was low and PS high, communities were still considered similar because the low SQS probably was related to random occurrence of rare genera which affects SQS much more than PS. If both coefficients were high, communities were similar in generic composition, relative abundance of genera present, and absolute cell number.

Correlation coefficients (Snedecor and Cochran, 1967) were calculated on untransformed data to test for possible relationships between total abundance and selected chemical and physical parameters.

6.2 Results and Discussion

High flow conditions, floating debris, or vandalism caused loss of substrates or entire samplers. Listed in table 6-1 are the sampling dates and locations when entire samplers for a particular analyses were lost.

Community Structure--During the 1974 through 1985 preoperational monitoring period, a total of 61 periphyton taxa was found in the vicinity of WBN. The temporal, spatial, and abundance information on the 23 chlorophyte, 26 chrysophyte, 8 cyanophyte, 3 euglenophyte, and 2 pyrrhophyte taxa found are presented in Appendix 6-A. The mean abundance, standard deviation, and coefficient of variation by periphyton group is given in Appendix 6-B. Of these 61 genera, 20 were found only once during the preoperational monitoring study through 1985. These 20 genera are listed in table 6-2. Most of these genera are planktonic forms which probably became entrapped in the filamentous algal periphyton, a common phenomenon.

Nine genera were dominant during the study period. These genera and the percentage of the 101 sample sets in which they were dominant are shown below.

Division	Genus	Percentage
Chlorophyta	Stigeoclonium	33
Chrysophyta	Achnanthes	36
	Cocconeis	1
	Cymbella	4
	Diatoma	8
	Gomphonema	7
	Melosira	5
	Navicula	5
Cyanophyta	Lyngbya	1

The total number of taxa by location is presented in table 6-3. For the first and last quarters of the sampling year, February and December, number of genera was low at all stations except TRM 496.5. For the February quarter at TRM 496.5, the number of genera increased. Correlation coefficients, for the number of genera present as a function of time, indicate these trends (table 6-4). The number of taxa for the remaining two quarters was not consistent, with the number increasing at some stations (TRM 496.5 May/June and TRM 527.4 August/September) and decreasing at others (e.g., TRM 506.6 May/June).

The minimum number of taxa found at any location was seven, and occurred twice at TRM 496.5 (November 1983 and December 1985) and once at TRM 506.6 (December 1985). The maximum number of taxa was 21 at TRM 528.0 in June 1977. The May/June quarters usually contained the maximum number of genera encountered for all stations except TRM 496.5 (August 1982) and TRM 529.5 (August 1982 and December 1982).

When community structure for each quarter was compared using only SQS (table 6-5), frequency of similarity was high among stations, ranging from 81 percent in 1976 and 1982 to 100 percent in 1975 and 1984. When both number of taxa and abundance were considered, PS (table 6-5), the frequency of similarity was lower, ranging from only 15 percent in 1982 to 70 percent in 1974 and 1975. The PS values decreased from 1974 to 1982, then began to rise with 1985 having the second highest PS values. The three upstream stations, TRMs 529.5, 528.0, and 527.4, usually had higher PS values than the lower three stations. This may be caused by the close proximity of these stations to each other and to Watts Bar Dam as well as the riverine habitat at these stations. This pattern was similar for the SQS values but was not as consistent.

SQS values varied from a low of 60 percent in November 1983 (TRM 496.5 vs 527.4 and TRM 496.5 vs 528.0) to a high of 100 percent in February 1983 (TRM 496.5 vs 528.0) and in December 1985 (TRM 528.0 vs 529.5). The PS values ranged from an astounding low of 1 percent in February 1983 (TRM 496.5 vs 527.4 and TRM 496.5 vs 528.0) to a peak level of 93 percent in several quarters, May 1976 (TRM 528.0 vs 529.5), June 1982 (TRM 527.4 vs 529.5), May 1985 (TRM 496.5 vs 529.5 and TRM 518.0 vs 528.0). It is noteworthy that a peak SQS value occurred for the same station comparison at which the lowest PS value occurred. The reason for this was that exactly the same genera occurred at both stations but the cellular abundance was 17,809 percent higher at the downstream station.

Overall, these high SQS values coupled with lower PS values show that the communities are made up of similar genera but differ in the abundance of these genera among stations.

Percentage compositions of the periphyton communities for the 1974 through 1985 sampling periods are given in table 6-6. Chrysophytes were dominant in most quarters and at most river miles. The frequency of chrysophyte domination ranged from 67 percent in 1985 to 100 percent in 1974. Occasionally a typical seasonal pattern occurred with chrysophytes dominant in cooler months and chlorophytes in warmer months. When chlorophytes comprised the dominant group, it was usually at TRM 506.6 and/or TRM 518.0. This occurred in June 1975, August 1976, September 1977, May 1983, July 1984, May 1985, and December 1985. Chlorophytes were the dominant group or codominant with chrysophytes at all stations in May 1985. The frequency of chlorophyte dominance at all sampling stations ranged from 0 percent in 1974 and 1982 to 29 percent in 1985.

Cyanophytes were dominant only once, June 1982 at TRM 518.0, when the group comprised 48.4 percent of the total community. Prior to 1982, cyanophytes were never more than 2.9 percent of the community and were usually less than 1 percent. In 1982, this group made up a much larger portion of the community when it occurred, ranging from 9.1 percent to 48.4 percent. After 1982, the cyanophytes decreased in percentage composition, but consistently occurred in the warmer months.

The dominant genera by quarter and location are presented in table 6-7. These dominant genera individually accounted for 21.6 percent to 84.8 percent of the total community. Chrysophyte taxa were usually dominant, with Achnanthes being dominant in 36 percent of the samples from 1974 to 1985 and accounting for 29.8 percent to 84.8 percent of the total abundance. Prior to 1982, Gomphonema and Melosira were dominant in 14 percent of the samples. Also, Diatoma was dominant in 12 percent of the 1982 to 1985 samples.

When a chlorophyte genus was dominant, 33 percent of the samples from 1974 to 1985, the genus was always the rheophilic filamentous alga, *Stigeoclonium*. This alga accounted for 24.4 percent to 77.8 percent of the community when it was dominant.

Only once was the periphyton community dominated by a cyanophyte genus. *Lyngbya*, a filamentous bluegreen alga, comprised 33.8 percent of the total community abundance at TRM 529.5 in December 1982. Dominance of a bluegreen genus during December was unusual. Usually, the cyanophytes do not become abundant until water temperatures increase.

Abundance--As expected with a cyclic community like periphyton, cell abundance varied by quarter, with the May/June quarters usually being the highest (1974-1984). However, in 1985, the highest total abundance for that year occurred in September. Minimum total abundance ranged from 3656 cells/cm^2 (August 1982, TRM 506.6) to 212,387 cells/cm^2 (June 1975, TRM 518.0). Peak abundance varied a great deal ranging from 72,322 cells/cm^2 (May 1974, TRM 529.5) to 3,820,187 cells/cm^2 (June 1982, TRM 506.6).

Cell abundance at TRM 506.6 was lowest in 39 percent of the quarters surveyed. The community at TRM 527.4 was lowest in cellular density for 25 percent of the quarters. However, the highest total abundance in 22 percent of the quarters occurred at TRM 506.6. Also, two other stations, TRM 496.5 and 518.0, each accounted for the highest abundance in 22 percent of the quarters.

By year, total cell abundance was lowest in 1974 with an average of 47,200 cells/cm^2. When monitoring was resumed in 1982, the periphyton total abundance peaked with a average density of 655,900 cells/cm^2. Thereafter, abundance decreased through 1985 when the second lowest average of the 1974 to 1985 study period occurred (172,500 cells/cm^2). This same pattern was exhibited by chrysophyte abundance with a peak abundance in 1982, averaging 416,240 cells/cm^2, and the lowest abundance in 1974, averaging 4,563 cells/cm^2.

Chlorophyte cell abundance followed the same pattern as total and chrysophyte abundance. Mean abundance was 1,152 cells/cm^2 in 1974 and 166,830 cells/cm^2 in 1982. Chlorophyte densities declined in 1983 (99,880 cells/cm^2), reached a secondary peak abundance in 1984 (116,890 cells/cm^2), then declined in 1985 to the second lowest (average chlorophyte) density of 62,440 cells/cm^2.

Cyanophyte yearly average abundance followed the same trend as chrysophyte yearly average abundance, lowest in 1974 (337 cells/cm^2) and highest in 1982 (113,680 cells/cm^2).

Table 6-8 contains the one-way analysis of variance and SNK test results by quarter and station from 1974 to 1985. With a few exceptions, there were no differences in total, chlorophyte, chrysophyte or cyanophyte abundance among quarters from 1974 to 1977. In May 1976 cell abundance (total, chlorophyte, and chrysophyte) at TRM 527.4 was considerably less than the other stations. In September 1977 there were significant differences among stations. Chrysophyte and total abundance at TRMs 506.6, 527.4, and 528.0 was significantly lower than TRMs 496.5 and 518.0. Total cell abundance was significantly lower at TRM 506.6, and chlorophyte abundance was lower at TRM 496.5.

From 1982 to 1985, significant differences among stations were common. There were no consistent trends among stations except that the total abundance at TRM 506.6 was significantly lower than other stations for 5 out of 15 quarters. This was also true to some extent for total abundance at TRM 529.5 (4 out of 15 quarters). Because chrysophytes were usually the most abundant group, similarities or differences in the total abundance among stations were usually the same as those for chrysophytes.

Table 6-9 presents the results of two-way analysis of variance and SNK tests on cell abundance pooled by quarter. As in the one-way ANOVAs, the station or year similarities (or differences) in total abundance followed patterns for chrysophytes. Significant differences in abundance by year for each quarter were common. Also, abundance by station was usually significantly different and yielded no consistent trends of similarity, ranking, or difference.

When the data were pooled by year and subjected to two-way ANOVAs and SNK tests, total abundance by year was significantly different (table 6-10). Cyanophyte abundance for 1974 through 1977 was not significantly different. Cyanophyte abundance for 1985 was significantly different than that in 1974 through 1977 and in 1982 through 1984. Abundance in 1985 was higher than 1974-1977 but less than 1982-1984. This reflects a trend found in other TVA reservoirs for bluegreen algae, i.e., an increase in blue-green algal abundance since the late 1970s, peaking in 1982 through 1983, and followed by a dramatic decline in 1984 and 1985.

Total periphyton and chlorophyte abundance at the station immediately below the plant discharge, TRM 527.4, was significantly lower than other stations (table 6-10) abundance. Chrysophyte abundance at this station was also lower than other stations, except for TRM 529.5.

Total abundance data compared with physical and chemical data revealed few relationships (table 6-11). However, a relatively strong inverse ralationship between river flow and total abundance was noted. This might be expected since higher flows can decrease the ability of some periphyton to adhere to a substrate and may increase abrasion of existing colonizing forms.

Autotrophic Indices--Chlorophyll a, the primary photosynthetic pigment for green plants, is useful as an index of the productivity of the periphyton community. The ratio of ash-free dry weight to chlorophyll, i.e., autotrophic index (AI), has been used to indicate periphyton community structure (Weitzel 1971). Additionally, it has been used to indicate changes in the ratio of the primary producing portion (autotrophic) to the consuming portion (heterotrophic) of the community in relation to environmental perturbations. Theoretically, an organic influx to the system will shift the community from a producing (autotrophic) phase to a consumptive (heterotrophic) phase, causing an increase in the AI. Normal AI values range from 50 to 200 with larger values generally assumed to indicate declining or poor water quality (Standard Methods, 1985). However, a problem with this index is the presence of nonviable organic material. Large amounts, which may be normal for the community in a particular location, will increase the amount of ash-free dry weight, thereby, greatly increasing the AI value (Grzenda and Brehener 1960).

Chlorophyll a degrades into several by-products, the major one being phaeophytin a. Because phaeophytin a abosorbs in the same spectral region as chlorophyll a, the concentration of chlorophyll a can be overestimated, if not corrected. Additionally, the ratio of chlorophyll a to phaeophytin a can be useful in assessing the health of the community. These corrected values were calculated and are presented with the other autotrophic index data.

The ash-free organic weight (AFOW) and phytopigment values for individual samples are in Appendix 6-C. Mean values for each sampling location by sampling dates for AFOW, corrected chlorophyll a, AI's and phaeophytin indices are in Appendix 6-D.

Results of the one-way ANOVAs and SNK multiple range tests for mean corrected chlorophyll a concentrations and ash-free organic weight data are presented in table 6-8. During 1976 through 1985, there were no significant differences in both corrected chlorophyll a concentrations and AFOW in 4 quarters (20 percent) out of the 20 quarters for which data available. Most of the data similarity occurred in 1983 (a low river flow year) when 3 of the 4 quarters had no significant differences among stations. All stations were significantly different from each other in 2 quarters (10 percent). In the remainder of cases, there were station differences but there were no consistent trend among stations.

Mean corrected chlorophyll a concentrations were lowest in 1977, ranging from 1.5 to 68.3 mg/m^2, and highest in 1983, varying from 0.2 to 147.8 mg/m^2 (table 6-12 and figure 6-1). The minimum value for each year usually occurred at one of the two stations upstream of WBN, while the maximum value usually occurred at TRM 518.0 (3 out of 6 years) or TRM 527.4 (2 out of 6 years). However, when the minimum/maximum station means for each quarter are reviewed, the trend is different. The stations above WBN were lowest in 33 percent of the quarters. One station, TRM 506.6, had the minimum station mean in 50 percent of the quarters studied. This station, together with TRM 496.5, accounted for 66 percent of the minimum station mean corrected chlorophyll a concentrations, 1976 through 1985. The phytopigment concentrations did not follow the same trend as abundance for the periphyton communities.

From 1976 through 1982, the year of peak abundance, the AFOW data followed the same trends as corrected chlorophyll a concentrations with lowest yearly mean values in 1977. Thereafter, there was an inverse relationship between the two parameters. AFOW values ranged from 686 to 5,974 mg/m^2 in 1977, the year with lowest mean values. In 1985 the mean AFOW values were highest, ranging from 186 to 494,173 mg/m^2. The yearly minimum mean values occurred at TRM 528.0 for three of the six years while the yearly maximum mean values occurred at TRM 518.0 in five of the six years studied.

When the station mean AFOW values by quarter (Appendix 6-D) are examined, the station at TRM 506.6 had the minimum value in 45 percent (9 out of 20) of the quarters studied. This station together with TRM 496.5 had the minimum station mean values in 70 percent (14 out of 20) of the quarters. The periphyton communities at TRM 518.0 had the maximum AFOW values in 10 of the 20 quarters studied (50 percent). The maximum and minumum trend found for AFOW values were the same as that for corrected chlorophyll a.

During this study there was a continual increase in the autotrophic indices from 1976, when mean AI values were lowest (ranging from 124 to 590), to the peak year, 1985 (25 to 8,088). This continual rise in AI values over the years has been documented in Guntersville Reservoir, another TVA reservoir (TVA, 1985). The yearly minimum values occurred at TRM 527.4 in three of the six years studied. There was no consistent trend for the yearly maximum values.

The minimum/maximum station means for AI values by quarter did not exhibit trends as strong as the AFOW or chlorophyll a data. Periphyton AI values were lowest at TRMs 496.5 and 527.4 each in 6 of the 20 quarters studied (30 percent). The AI values at TRM 529.5 were highest in 6 of the 20 quarters studied; and together with TRM 528.0, the other station above WBN, were highest in 10 of the 20 quarters.

The phaeophytin index (PI) values, a ratio of chlorophyll a to phaeophytin a, were lowest in 1976, with station means ranging from 1.13 to 1.47. PI values for the study period peaked in 1977, ranging from 1.42 to 1.66. There were several station means in 1977 which were above 1.70, although out of theoretical range, still indicate healthy periphyton communities. After 1977, PI values decreased somewhat but remained fairly constant throughout the rest of the study. Generally, higher AI and PI values indicate a shift to more heterotrophic growth.

6.3 Summary and Conclusions

Artificial substrates were used to monitor the periphyton community in the vicinity of WBN from 1973 to 1977, then resumed from 1982 through 1985. A total of 61 periphyton taxa was identified which included 23 chlorophyte genera, 26 chrysophyte genera, 8 cyanophyte genera, 3 euglenophyte genera, and 2 pyrrhophyte genera. Of these 61 genera, 20 were found only once during the study. Most of these 20 genera were planktonic forms which probably became entrapped in the periphyton community. Of the remaining 41 genera, nine were dominant in the periphyton community on one or more occasions. Two rheophilic genera, Stigeoclonium, a chlorophyte, and Achnanthes, a diatom, were dominant in 69 percent of the samples. These two genera typically are dominant in other TVA reservoirs. A cyanophyte genus, Lyngbya, was dominant only once in the entire study, June 1982. The number of genera found at any location ranged from a minimum of 7 to a maximum of 21. The December quarter usually had the fewest taxa and the May/June quarter usually had the highest number of taxa.

Throughout the study period, genera comprising the community structure were usually similar at all stations. The frequency of similarity (Sorenson's Quotient) ranged from 81 percent of the station comparisons in 1976 and 1982 to 100 percent in 1975 and 1984. However, this high degree of similarity decreased when both taxa and abundance were considered. The three stations closest to WBN and Watts Bar Dam, TRMs 529.5, 528.0, and 527.4, usually were more similar in community structure than the lower stations, TRMs 496.5, 506, and 518. Overall, communities among stations were composed of similar genera but differed in abundance.

As expected, total cell abundance varied by quarter, with the May/June quarters usually the highest. By year, total abundance was lowest in 1974 with an average of 47,200 cells/cm^2. Abundance increased in 1975 to an average of 299,000 cells/cm^2. Thereafter, it decreased through 1977. When monitoring was resumed in 1982, periphyton total cell abundance peaked with an average density of 655,900 cells/cm^2. This same pattern of abundance was exhibited by separate taxa, particularly chrysophytes, chlorophytes, and cyanophytes.

With few exceptions, there were no differences in total cell abundance among stations from 1974 to 1977. However, from 1982 through 1985, total abundance at TRM 506.6 and TRM 529.5 tended to be lower than other stations but no consistent trends were established. Abundance data did not correlate strongly with physical or chemical data except that a relatively strong inverse relationship to river flow was noted.

Corrected chlorophyll a concentrations were lowest in 1977, and highest in 1983. Ash free dry weight (AFDW) followed the same trend through 1982, then an inverse relation between the two parameters occurred. Both chlorophyll a and AFDW varied widely by quarter and station. Autotrophic index (AI) values, derived from these parameters, continually increased from 1976 through 1985 (124 to 590 and 25 to 8,088, respectively). Phaeophyton index (PI) values were lowest in 1976, station means ranging from 1.13 to 1.47, and highest in 1977, range of means 1.42 to 1.66. After 1977, PI values decreased slightly and remained fairly constant through 1985.

Generally, preoperational monitoring results indicated that the periphyton community in the vicinity of WBN is typical of mainstream reservoirs on the Tennessee River; however, the relatively high AI and PI values indicate a shift to more heterotrophic growth.

Table 6-1. Sampling Dates and Locations Where Entire Periphyton Samplers Were Lost, Watts Bar Nuclear Plant, Chickamauga Reservoir.

	TENNESSEE RIVER MILE					
DATE	496.5	506.6	518.0	527.4	528.0	529.5
August 1975		ID, AI*	ID, AI	ID, AI	ID, AI	ID, AI
August 1976					ID, AI	
June 1977	ID, AI	ID, AI				ID, AI
September 1977						ID, AI
December 1977	AI				ID, AI	ID, AI
June 1982	ID, AI					
December 1982		ID, AI	ID, AI	ID, AI	ID, AI	
February 1983		ID, AI				ID, AI
May 1983	ID, AI			ID, AI	ID, AI	ID, AI
September 1983	ID, AI		ID, AI	ID, AI	ID, AI	
November 1983		ID, AI				
February 1984	ID, AI					
July 1984				ID, AI	ID, AI	ID, AI
September 1984						ID, AI
December 1984			ID, AI			
March 1985			ID, AI	ID, AI		
September 1985						ID, AI

*ID = Slides for algal identification and enumeration.
AI = Slides for autotrophic index analysis.

Table 6-2. List of Periphyton Genera Which Occurred Only Once During Preoperational Monitoring, Watts Bar Nuclear Plant, Chickamauga Reservoir, 1974-1985.

Division	Genus	Date	Location (Tennessee River Mile)
Chlorophyta	*Closterium*	MAY 76	506.6
	Draparnaldia	MAY 74	506.6, 518.0, 527.4, 529.5
	Kirchneriella	JUN 77	528.0
	Micractinium	AUG 82	518.0
	Protoderma	AUG 82	496.5
	Schroederia	MAY 85	527.4
	Spirogyra	SEP 77	518.0
	Tetraspora	MAY 74	518.0
Chrysophyta	*Cymatopleura*	FEB 84	518.0
	Mallomonas	MAR 85	529.5
	Meridion	FEB 83	496.5, 518.0, 527.4, 528.0
	Rhizosolenia	SEP 84	506.6
	Rhoicosphenia	JUN 77	518.0, 527.4
Cyanophyta	*Anacystis*	JUN 77	518.0, 528.0
	Chroococcus	DEC 77	506.6
	Oscillatoria (spiral)	JUN 82	518.0
	Phormidium	MAY 74	506.6, 518.0, 527.4, 528.0 529.5
Euglenophyta	*Trachelomonas*	AUG 76	518.0
Pyrrhophyta	*Glenodinium*	DEC 77	518.0, 527.4
	Gymnodinium	MAY 76	529.5

Table 6-3. Number of Periphyton Taxa at Each Station and Number of Periphyton Taxa in Common Between Stations During Preoperational Monitoring from 1974 to 1985, Watts Bar Nuclear Plant, Chickamauga Reservoir.

Date	Station (TRM)	Number of Taxa at Station	Number of Taxa Common Between Stations TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1974	506.6	17			12	15	10	12
	518.0	14				12	10	11
	527.4	19					10	13
	528.0	10						10
	529.5	14						
August 1974	506.6	13			8	9	11	9
	518.0	8				7	8	8
	527.4	12					10	10
	528.0	14						13
	529.5	14						
June 1975	506.6	17			12	12	13	13
	518.0	14				12	11	13
	527.4	15					12	13
	528.0	15						13
	529.5	16						
May 1976	506.6	20			15	10	13	14
	518.0	20				14	15	14
	527.4	15					12	12
	528.0	19						13
	529.5	16						
August 1976	506.6	17			13	14		11
	518.0	17				12		10
	527.4	15						11
	529.5	13						
June 1977	518.0	16				14	14	
	527.4	19					16	
	528.0	21						
September 1977	496.5	12		9	11	9	8	
	506.6	10			9	8	7	
	518.0	15				10	9	
	527.4	10					7	
	528.0	10						

Table 6-3 (Continued)

Date	Station (TRM)	Number of Taxa at Station	Number of Taxa Common Between Stations TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
December 1977	496.5	12		10	9	9		
	506.6	15			12	11		
	518.0	17				13		
	527.4	15						
June 1982	506.6	20			17	18	16	14
	518.0	19				18	16	14
	527.4	19					17	14
	528.0	18						13
	529.5	15						
August 1982	496.5	20		10	16	14	15	17
	506.6	11			10	9	9	10
	518.0	18				14	15	16
	527.4	15					14	15
	528.0	15						15
	529.5	20						
December 1982	496.5	13						12
	529.5	20						
February 1983	496.5	12			12	11	12	
	518.0	15				14	12	
	527.4	15					11	
	528.0	12						
May 1983	506.6	9			8			
	518.0	13						
September 1983	506.6	13						11
	529.5	15						
November 1983	496.5	7			7	6	6	6
	518.0	14				12	12	11
	527.4	13					11	10
	528.0	13						11
	529.5	11						

Table 6-3 (Continued)

Date	Station (TRM)	Number of Taxa at Station	Number of Taxa Common Between Stations					
			TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
February 1984	506.6	10			10	10	10	9
	518.0	14				12	11	10
	527.4	14					11	11
	528.0	12						10
	529.5	11						
July 1984	496.5	8		8	8			
	506.6	13			10			
	518.0	10						
September 1984	496.5	11		11	11	11	11	
	506.6	13			12	12	12	
	518.0	13				12	12	
	527.4	16					13	
	528.0	14						
December 1984	496.5	11		11		10	11	11
	506.6	12				11	12	11
	527.4	11					11	10
	528.0	14						13
	529.5	13						
March 1985	496.5	13		8			8	7
	506.6	9					9	7
	528.0	10						8
	529.5	9						
May 1985	496.5	13		9	11	13	11	13
	506.6	10			10	10	9	9
	518.0	13				13	12	11
	527.4	19				14	14	14
	528.0	14						12
	529.5	14						
September 1985	496.5	13		12	13	13	12	
	506.6	12			12	12	11	
	518.0	16				15	13	
	527.4	16					13	
	528.0	13						

Table 6-3 (Continued)

Date	Station (TRM)	Number of Taxa at Station	Number of Taxa Common Between Stations TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
December 1985	496.5	7		5	6	5	5	5
	506.6	7			6	6	6	6
	518.0	10				9	8	8
	527.4	9					8	8
	528.0	8						8
	529.5	8						

Table 6-4. Correlation Coefficients by Quarter and River Mile, Comparing Number of Genera Found Over Time, Watts Bar Nuclear Plant Preoperational Monitoring, Chickamauga Reservoir, 1974-1985.

	TENNESSEE RIVER MILE					
QUARTER	496.5	506.6	518.0	527.4	528.0	529.5
FEB	+1.0	-1.0	-1.0	-1.0	-0.9	-1.0
MAY/JUN	+1.0	-0.9	-0.3	+0.5	+0.1	-0.4
AUG/SEPT	0.0	-0.3	+0.4	+0.7	+0.3	+0.6
NOV/DEC	-0.6	-0.9	-0.9	-0.9	-0.8	-0.8

Table 6-5. Similarity of Periphyton Community Composition/Structure During Preoperational Monitoring from 1974 to 1985. Based on Sorensen's Quotient of Similarity and Percentage Similarity, Watts Bar Nuclear Plant, Chickamauga Reservoir.

Date	Station Comparison	Sorensen's Quotient of Similarity (%)	Percentage Similarity (%)
May 1974	TRM 506.6 - 518.0	77	85
	TRM 506.6 - 527.4	83	79
	TRM 506.6 - 528.0	74	77
	TRM 506.6 - 529.5	77	82
	TRM 518.0 - 527.4	73	72
	TRM 518.0 - 528.0	83	73
	TRM 518.0 - 529.5	79	80
	TRM 527.4 - 528.0	69	81
	TRM 527.4 - 529.5	79	72
	TRM 528.0 - 529.5	83	80
August 1974	TRM 506.6 - 518.0	76	68
	TRM 506.6 - 527.4	72	64
	TRM 506.6 - 528.0	81	58
	TRM 506.6 - 529.5	89	60
	TRM 518.0 - 527.4	70	74
	TRM 518.0 - 528.0	73	63
	TRM 518.0 - 529.5	73	64
	TRM 527.4 - 528.0	77	72
	TRM 527.4 - 529.5	77	70
	TRM 528.0 - 529.5	93	84
June 1975	TRM 506.6 - 518.0	77	57
	TRM 506.6 - 527.4	81	82
	TRM 506.6 - 528.0	81	72
	TRM 506.6 - 529.5	79	80
	TRM 518.0 - 527.4	83	57
	TRM 518.0 - 528.0	76	57
	TRM 518.0 - 529.5	87	70
	TRM 527.4 - 528.0	87	88
	TRM 527.4 - 529.5	84	87
	TRM 528.0 - 529.5	84	83
May 1976	TRM 506.6 - 518.0	75	86
	TRM 506.6 - 527.4	63	29
	TRM 506.6 - 528.0	62	85
	TRM 506.6 - 529.5	78	82
	TRM 518.0 - 527.4	80	32
	TRM 518.0 - 528.0	77	83
	TRM 518.0 - 529.5	78	78
	TRM 527.4 - 528.0	71	27
	TRM 527.4 - 529.5	77	26
	TRM 528.0 - 529.5	74	93

Table 6-5 (Continued)

Date	Station Comparison	Sorensen's Quotient of Similarity (%)	Percentage Similarity (%)
August 1976	TRM 506.6 - 518.0	76	32
	TRM 506.6 - 527.4	88	42
	TRM 506.6 - 529.5	73	43
	TRM 518.0 - 527.4	75	49
	TRM 518.0 - 529.5	67	61
	TRM 527.4 - 529.5	79	68
June 1977	TRM 518.0 - 527.4	80	78
	TRM 518.0 - 528.0	76	68
	TRM 527.4 - 528.0	80	86
September 1977	TRM 496.5 - 506.6	82	29
	TRM 496.5 - 518.0	81	84
	TRM 496.5 - 527.4	82	35
	TRM 496.5 - 528.0	73	42
	TRM 506.6 - 518.0	72	31
	TRM 506.6 - 527.4	80	52
	TRM 506.6 - 528.0	70	70
	TRM 518.0 - 527.4	80	27
	TRM 518.0 - 528.0	72	42
	TRM 527.4 - 528.0	70	68
December 1977	TRM 496.5 - 506.6	74	34
	TRM 496.5 - 518.0	62	72
	TRM 496.5 - 527.4	67	66
	TRM 506.6 - 518.0	75	33
	TRM 506.6 - 527.4	73	35
	TRM 518.0 - 527.4	88	81
June 1982	TRM 506.6 - 518.0	87	30
	TRM 506.6 - 527.4	92	11
	TRM 506.6 - 528.0	84	30
	TRM 506.6 - 529.5	80	12
	TRM 518.0 - 527.4	95	28
	TRM 518.0 - 528.0	87	49
	TRM 518.0 - 529.5	82	30
	TRM 527.4 - 528.0	92	48
	TRM 527.4 - 529.5	82	93
	TRM 528.0 - 529.5	79	49

Table 6-5 (Continued)

Date	Station Comparison	Sorensen's Quotient of Similarity (%)	Percentage Similarity (%)
August 1982	TRM 496.5 - 506.6	65	3
	TRM 496.5 - 518.0	84	61
	TRM 496.5 - 527.4	80	64
	TRM 496.5 - 528.0	86	73
	TRM 496.5 - 529.5	85	39
	TRM 506.6 - 518.0	69	3
	TRM 506.6 - 527.4	69	4
	TRM 506.6 - 528.0	69	3
	TRM 506.6 - 529.5	65	10
	TRM 518.0 - 527.4	85	70
	TRM 518.0 - 528.0	91	66
	TRM 518.0 - 529.5	84	43
	TRM 527.4 - 528.0	93	78
	TRM 527.4 - 529.5	86	56
	TRM 528.0 - 529.5	86	45
December 1982	TRM 496.5 - 529.5	73	4
February 1983	TRM 496.5 - 518.0	89	27
	TRM 496.5 - 527.4	81	1
	TRM 496.5 - 528.0	100	1
	TRM 518.0 - 527.4	93	4
	TRM 518.0 - 528.0	89	7
	TRM 527.4 - 528.0	81	66
May 1983	TRM 506.6 - 518.0	73	64
September 1983	TRM 506.6 - 529.5	79	17
November 1983	TRM 496.5 - 518.0	67	56
	TRM 496.5 - 527.4	60	60
	TRM 496.5 - 528.0	60	67
	TRM 496.5 - 529.5	67	69
	TRM 518.0 - 527.4	89	85
	TRM 518.0 - 528.0	89	76
	TRM 518.0 - 529.5	88	75
	TRM 527.4 - 528.0	85	83
	TRM 527.4 - 529.5	83	82
	TRM 528.0 - 529.5	92	87

Table 6-5 (Continued)

Date	Station Comparison	Sorensen's Quotient of Similarity (%)	Percentage Similarity (%)
February 1984	TRM 506.6 - 518.0	83	56
	TRM 506.6 - 527.4	83	65
	TRM 506.6 - 528.0	91	52
	TRM 506.6 - 529.5	86	27
	TRM 518.0 - 527.4	86	80
	TRM 518.0 - 528.0	85	70
	TRM 518.0 - 529.5	80	33
	TRM 527.4 - 528.0	85	65
	TRM 527.4 - 529.5	88	30
	TRM 528.0 - 529.5	87	22
July 1984	TRM 496.5 - 506.6	76	92
	TRM 496.5 - 518.0	89	88
	TRM 506.6 - 518.0	87	90
September 1984	TRM 496.5 - 506.6	92	76
	TRM 496.5 - 518.0	92	70
	TRM 496.5 - 527.4	82	69
	TRM 496.5 - 528.0	88	67
	TRM 506.6 - 518.0	92	51
	TRM 506.6 - 527.4	83	52
	TRM 506.6 - 528.0	89	52
	TRM 518.0 - 527.4	83	84
	TRM 518.0 - 528.0	89	85
	TRM 527.4 - 528.0	87	91
December 1984	TRM 496.5 - 506.6	96	61
	TRM 496.5 - 527.4	91	62
	TRM 496.5 - 528.0	88	59
	TRM 496.5 - 529.5	92	65
	TRM 506.6 - 527.4	96	81
	TRM 506.6 - 528.0	92	53
	TRM 506.6 - 529.5	88	51
	TRM 527.4 - 528.0	88	56
	TRM 527.4 - 529.5	83	61
	TRM 528.0 - 529.5	96	84
March 1985	TRM 496.5 - 506.6	73	80
	TRM 496.5 - 528.0	70	70
	TRM 496.5 - 529.5	64	41
	TRM 506.6 - 528.0	95	81
	TRM 506.6 - 529.5	78	38
	TRM 528.0 - 529.5	84	39

Table 6-5 (Continued)

Date	Station Comparison	Sorensen's Quotient of Similarity (%)	Percentage Similarity (%)
May 1985	TRM 496.5 - 506.6	78	67
	TRM 496.5 - 518.0	85	65
	TRM 496.5 - 527.4	81	80
	TRM 496.5 - 528.0	82	66
	TRM 496.5 - 529.5	96	93
	TRM 506.6 - 518.0	87	66
	TRM 506.6 - 527.4	69	56
	TRM 506.6 - 528.0	75	70
	TRM 506.6 - 529.5	75	61
	TRM 518.0 - 527.4	81	75
	TRM 518.0 - 528.0	89	93
	TRM 518.0 - 529.5	82	65
	TRM 527.4 - 528.0	85	80
	TRM 527.4 - 529.5	85	81
	TRM 528.0 - 529.5	86	68
September 1985	TRM 496.5 - 506.6	96	41
	TRM 496.5 - 518.0	90	68
	TRM 496.5 - 527.4	90	60
	TRM 496.5 - 528.0	92	62
	TRM 506.6 - 518.0	86	33
	TRM 506.6 - 527.4	86	33
	TRM 506.6 - 528.0	88	27
	TRM 518.0 - 527.4	94	89
	TRM 518.0 - 528.0	90	87
	TRM 527.4 - 528.0	90	84
December 1985	TRM 496.5 - 506.6	71	82
	TRM 496.5 - 518.0	71	67
	TRM 496.5 - 527.4	63	87
	TRM 496.5 - 528.0	67	84
	TRM 496.5 - 529.5	67	77
	TRM 506.6 - 518.0	71	69
	TRM 506.6 - 527.4	75	83
	TRM 506.6 - 528.0	80	76
	TRM 506.6 - 529.5	80	77
	TRM 518.0 - 527.4	95	68
	TRM 518.0 - 528.0	89	65
	TRM 518.0 - 529.5	89	83
	TRM 527.4 - 528.0	94	92
	TRM 527.4 - 529.5	94	77
	TRM 528.0 - 529.5	100	75

Table 6-6. Percentage Composition of Periphyton Groups During Preoperational Monitoring (1974-1985), Watts Bar Nuclear Plant, Chickamauga Reservoir.

Date	Group	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 74	Chlorophyta	0.00	2.36	0.92	3.11	2.41	1.96
	Chrysophyta	0.00	95.12	97.76	96.26	96.91	97.68
	Cyanophyta	0.00	2.52	1.32	0.63	0.69	0.36
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Aug 74	Chlorophyta	0.00	1.86	1.78	2.54	3.11	4.78
	Chrysophyta	0.00	98.14	98.22	97.46	96.89	95.22
	Cyanophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Jun 75	Chlorophyta	0.00	49.19	4.55	44.42	36.83	39.56
	Chrysophyta	0.00	47.91	95.28	55.34	62.50	60.27
	Cyanophyta	0.00	2.90	0.18	0.24	0.67	0.18
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
May 76	Chlorophyta	0.00	45.66	31.69	21.90	36.76	34.98
	Chrysophyta	0.00	53.86	68.01	77.90	63.01	64.73
	Cyanophyta	0.00	0.46	0.30	0.20	0.23	0.29
	Euglenophyta	0.00	0.02	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Aug 76	Chlorophyta	0.00	5.94	78.06	29.65	0.00	45.58
	Chrysophyta	0.00	91.38	20.46	68.84	0.00	54.42
	Cyanophyta	0.00	2.69	1.47	1.51	0.00	0.00
	Euglenophyta	0.00	0.00	0.01	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Jun 77	Chlorophyta	0.00	0.00	41.30	25.01	12.84	0.00
	Chrysophyta	0.00	0.00	58.59	74.88	86.84	0.00
	Cyanophyta	0.00	0.00	0.11	0.12	0.32	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00

Table 6-6 (Continued)

Date	Group	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 77	Chlorophyta	7.33	50.74	11.69	24.36	44.57	0.00
	Chrysophyta	92.56	49.11	88.14	75.64	54.91	0.00
	Cyanophyta	0.11	0.15	0.17	0.00	0.52	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Dec 77	Chlorophyta	0.04	31.38	3.78	4.85	0.00	0.00
	Chrysophyta	99.86	68.41	96.13	94.48	0.00	0.00
	Cyanophyta	0.10	0.21	0.08	0.67	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.01	0.00	0.00	0.00
Jun 82	Chlorophyta	0.00	24.88	30.39	14.25	26.44	15.92
	Chrysophyta	0.00	62.62	21.21	65.85	53.11	65.83
	Cyanophyta	0.00	12.50	48.39	19.90	20.45	18.25
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Aug 82	Chlorophyta	17.56	3.47	6.44	8.59	18.13	7.81
	Chrysophyta	46.55	96.53	70.68	77.85	65.60	83.08
	Cyanophyta	35.89	0.00	22.88	13.56	16.27	9.11
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Dec 82	Chlorophyta	34.64	0.00	0.00	0.00	0.00	4.06
	Chrysophyta	65.36	0.00	0.00	0.00	0.00	49.52
	Cyanophyta	0.00	0.00	0.00	0.00	0.00	46.41
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Feb 83	Chlorophyta	0.00	0.00	0.00	0.15	0.00	0.00
	Chrysophyta	100.00	0.00	100.00	99.85	100.00	0.00
	Cyanophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
May 83	Chlorophyta	0.00	46.71	24.94	0.00	0.00	0.00
	Chrysophyta	0.00	44.38	57.12	0.00	0.00	0.00
	Cyanophyta	0.00	8.92	17.93	0.00	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00

Table 6-6 (Continued)

Date	Group	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 83	Chlorophyta	0.00	45.28	0.00	0.00	0.00	7.98
	Chrysophyta	0.00	54.68	0.00	0.00	0.00	67.43
	Cyanophyta	0.00	0.00	0.00	0.00	0.00	24.58
	Euglenophyta	0.00	0.03	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Nov 83	Chlorophyta	32.35	0.00	10.13	9.64	11.32	11.56
	Chrysophyta	67.65	0.00	89.87	90.36	83.58	88.44
	Cyanophyta	0.00	0.00	0.00	0.00	5.10	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Feb 84	Chlorophyta	0.00	0.00	0.12	0.03	0.00	0.11
	Chrysophyta	0.00	100.00	99.27	99.97	100.00	99.89
	Cyanophyta	0.00	0.00	0.62	0.00	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Jul 84	Chlorophyta	46.81	47.24	49.91	0.00	0.00	0.00
	Chrysophyta	46.93	41.89	38.77	0.00	0.00	0.00
	Cyanophyta	6.26	10.87	11.32	0.00	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrophyta	0.00	0.00	0.00	0.00	0.00	0.00
Sep 84	Chlorophyta	35.54	31.75	28.86	23.39	18.88	0.00
	Chrysophyta	54.25	50.55	55.06	56.35	54.94	0.00
	Cyanophyta	10.21	17.70	16.08	20.26	26.18	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Dec 84	Chlorophyta	22.86	17.92	0.00	32.67	48.83	42.94
	Chrysophyta	77.14	82.08	0.00	67.33	38.07	43.50
	Cyanophyta	0.00	0.00	0.00	0.00	13.10	13.56
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Mar 85	Chlorophyta	3.88	0.00	0.00	0.00	0.00	0.00
	Chrysophyta	89.91	100.00	0.00	0.00	100.00	100.00
	Cyanophyta	6.01	0.00	0.00	0.00	0.00	0.00
	Euglenophyta	0.20	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00

Table 6-6 (Continued)

Date	Group	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 85	Chlorophyta	49.99	57.49	43.48	42.20	40.20	51.21
	Chrysophyta	50.01	42.51	35.92	36.14	38.63	48.79
	Cyanophyta	0.00	0.00	20.60	21.66	21.17	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Sep 85	Chlorophyta	39.21	12.46	21.35	14.89	22.42	0.00
	Chrysophyta	44.68	87.54	61.35	69.03	64.89	0.00
	Cyanophyta	16.11	0.00	17.30	16.08	12.69	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00
Dec 85	Chlorophyta	41.74	53.51	35.46	45.81	40.04	45.04
	Chrysophyta	58.26	46.39	64.54	54.19	59.96	54.60
	Cyanophyta	0.00	0.10	0.00	0.00	0.00	0.00
	Euglenophyta	0.00	0.00	0.00	0.00	0.00	0.00
	Pyrrhophyta	0.00	0.00	0.00	0.00	0.00	0.00

Table 6-7. Dominant Periphyton Genera and Percentage of Total Abundance Made Up By That Genera Collected in the Vicinity of Watts Bar Nuclear Plant During Preoperational Monitoring, Chickamauga Reservoir, 1974-1985.

	TRM 496.5		TRM 506.6		TRM 518.0		TRM 527.4		TRM 528.0		TRM 529.5	
Quarter	Dominant Genus	% of Total Abundance	Dominant Genus	% of Total Abundance	Dominant Genus	% of Total Abundance	Dominant Genus	% of Total Abundance	Dominant Genus	% of Total Abundance	Dominant Genus	% of Total Abundance
MAY 74	—		Melosira	25.6	Melosira	34.5	Melosira	33.5	Cymbella	41.3	Cymbella	38.2
AUG 74	—		Navicula	39.5	Melosira	27.5	Navicula	33.2	Melosira	22.6	Gomphonema	22.0
JUN 75	—		Stigeoclonium	48.3	Gomphonema	60.4	Stigeoclonium	44.2	Stigeoclonium	36.8	Stigeoclonium	39.5
MAY 76	—		Stigeoclonium	43.2	Cymbella	32.7	Cymbella	39.2	Stigeoclonium	36.6	Stigeoclonium	34.7
AUG 76	—		Navicula	27.5	Stigeoclonium	77.8	Achnanthes	44.0	—		Stigeoclonium	45.0
JUN 77	—		—		Achnanthes	47.9	Achnanthes	62.5	Achnanthes	67.2	—	
SEP 77	Achnanthes	84.8	Stigeoclonium	50.7	Achnanthes	69.5	Achnanthes	64.6	Stigeoclonium	44.1	—	
DEC 77	Gomphonema	39.5	Stigeoclonium	28.2	Gomphonema	57.3	Gomphonema	41.6	—		—	
JUN 82	—		Achnanthes	58.2	Stigeoclonium	25.9	Achnanthes	40.8	Achnanthes	44.7	Achnanthes	39.5
AUG 82	Achnanthes	29.8	Cocconeis	72.3	Achnanthes	60.3	Achnanthes	58.8	Achnanthes	41.9	Achnanthes	58.1
DEC 82	Achnanthes	49.2	—		—		—		—		Lyngbya	33.8
FEB 83	Navicula	38.9	—		Navicula	22.9	Gomphonema	21.6	Diatoma	33.8	—	
JUN 83	—		Stigeoclonium	46.7	Achnanthes	35.3	—		—		—	
SEP 83	—		Stigeoclonium	42.6	—		—		—		Achnanthes	39.5
NOV 83	Achnanthes	35.8	—		Achnanthes	61.5	Achnanthes	49.0	Achnanthes	42.2	Achnanthes	45.5
FEB 84	—		Gomphonema	35.8	Diatoma	42.1	Diatoma	31.3	Diatoma	50.8	Synedra	27.8
JUL 84	Stigeoclonium	46.8	Stigeoclonium	45.1	Stigeoclonium	49.8	—		—		—	
SEP 84	Achnanthes	39.4	Achnanthes	42.1	Achnanthes	37.2	Achnanthes	33.2	Achnanthes	33.9	—	
DEC 84	Achnanthes	37.9	Achnanthes	32.7	—		Achnanthes	34.5	Stigeoclonium	46.8	Stigeoclonium	41.4
MAR 85	Diatoma	25.0	Diatoma	31.0	—		—		Diatoma	48.2	Diatoma	62.2
MAY 85	Stigeoclonium	28.5	Stigeoclonium	57.5	Stigeoclonium	40.0	Stigeoclonium	24.4	Stigeoclonium	37.7	Stigeoclonium	28.6
SEP 85	Stigeoclonium	38.4	Achnanthes	34.2	Achnanthes	34.4	Achnanthes	44.7	Achnanthes	37.4	—	
DEC 85	Stigeoclonium	41.7	Stigeoclonium	53.5	Stigeoclonium	34.8	Stigeoclonium	44.9	Stigeoclonium	39.1	Stigeoclonium	44.8

Table 6-8. Results of One-Way Analysis of Variance and Student-Newman-Keuls Multiple Range Test on Periphyton Abundance, Chlorophyll a, and Ash-Free Dry Weight Data, Watts Bar Nuclear Plant Preoperational Monitoring, Chickamauga Reservoir, 1974-1985.

Date	Test Parameter	F-Ratio	Student-Newman-Keuls Multiple Range Test Results: Low Mean				High Mean
May 1974	Total Periphyton	2.37 (NS)**	4†	5	2	3	6
	Chlorophyta	0.76 (NS)	3	5	6	4	2
	Chrysophyta	2.38 (NS)	4	5	2	3	6
	Cyanophyta*	6.73 (NS)	4	6	5	3	2
	Chlorophyll a††						
	Ash-free dry weight††						
Aug 1974	Total Periphyton	5.02 (NS)	2	3	4	6	5
	Chlorophyta	2.55 (NS)	2	3	4	5	6
	Chrysophyta	4.92 (NS)	2	3	4	6	5
	Cyanophyta††						
	Chlorophyll a††						
	Ash-free dry weight††						
Jun 1985	Total Periphyton*	0.70 (NS)	3	5	6	4	2
	Chlorophyta*	3.59 (NS)	3	6	5	4	2
	Chrysophyta*	0.14 (NS)	2	4	5	6	3
	Cyanophyta*	0.06 (NS)	3	6	4	2	5
	Chlorophyll a††						
	Ash-free dry weight††						
May 1976	Total Periphyton	285.76	4	3	2	5	6
	Chlorophyta	90.29	4	3	5	6	2
	Chrysophyta	113.05	4	2	3	5	6
	Cyanophyta	2.44 (NS)	4	5	3	6	2
	Chlorophyll a	3.62	4	6	2	3	5
	Ash-free dry weight	2.57	4	2	6	3	5
Aug 1976	Total Periphyton	8.78 (NS)	2	6	4	3	
	Chlorophyta	20.42 (NS)	2	4	6	3	
	Chrysophyta	40.75 (NS)	3	2	6	4	
	Cyanophyta	0.01 (NS)	1	3	2		
	Chlorophyll a	1.07 (NS)	3	2	6	4	
	Ash-free dry weight	110.15	2	6	4	3	

Table 6-8 (Continued)

Date	Test Parameter	F-Ratio	Student-Newman-Keuls Multiple Range Test Results: Low Mean → High Mean
Jun 1977	Total Periphyton*	1.09 (NS)	5 4 3
	Chlorophyta*	184.97 (NS)	5 4 3
	Chrysophyta*	0.13 (NS)	4 5 3
	Cyanophyta*	1.31 (NS)	4 3 5
	Chlorophyll *a**	17.25	5 4 3
	Ash-free dry weight*	20.48	5 4 3
Sep 1977	Total Periphyton*	13.73	4 2 5 1 3
	Chlorophyta*	3.90 (NS)	4 1 2 3 5
	Chrysophyta*	23.13	2 4 5 1 3
	Cyanophyta*	1.33	2 1 5 3
	Chlorophyll *a**	32.52	2 4 5 1 3
	Ash-free dry weight*	36.12	2 5 4 1 3
Dec 1977	Total Periphyton*	34.78	2 4 3 1
	Chlorophyta*	40.51	1 3 4 2
	Chrysophyta*	10.98 (NS)	2 4 3 1
	Cyanophyta*	1.45 (NS)	3 2 1 4
	Chlorophyll *a**	50.47	2 1 4 3
	Ash-free dry weight*	20.92	2 1 4 3
Jun 1982	Total Periphyton	462.77	4 6 5 3 2
	Chlorophyta	964.63	4 6 5 3 2
	Chrysophyta	926.24	4 6 3 5 2
	Cyanophyta	36.63	4 6 5 3 2
	Chlorophyll *a**	11.76	6 2 4 5 3
	Ash-free dry weight*	10.72	5 2 6 4 3
Aug 1982	Total Periphyton	113.59	2 6 4 3 5 1
	Chlorophyta	100 80	2 6 4 3 5 1
	Chrysophyta	80.13	2 6 4 1 5 3
	Cyanophyta	291.94	2 6 4 5 3 1
	Chlorophyll *a**	12.44	2 6 1 4 5 3
	Ash-free dry weight*	44.93	2 1 6 4 3 5
Dec 1982	Total Periphyton	1978.08	6 1
	Chlorophyta	269.65	6 1
	Chrysophyta	2359.40	6 1
	Cyanophyta††		
	Chlorophyll *a*	12.27	1 6
	Ash-free dry weight	136.17	1 6

Table 6-8 (Continued)

Date	Test Parameter	F-Ratio		Student-Newman-Keuls Multiple Range Test Results Low Mean				High Mean
Feb 1983	Total Periphyton	1385.32		4	5	3	1	
	Chlorophyta	1.00	(NS)	5	3	1	4	
	Chrysophyta	1363.35		4	5	3	1	
	Cyanophyta††							
	Chlorophyll a*	106.72		5	4	3	1	
	Ash-free dry weight*	130.39		5	4	3	1	
Jun 1983	Total Periphyton	18.15		2	3			
	Chlorophyta	120.83		3	2			
	Chrysophyta	105.95		2	3			
	Cyanophyta	32.66	(NS)	2	3			
	Chlorophyll a*	2.30	(NS)	2	3			
	Ash-free dry weight*	4.68		2	3			
Sep 1983	Total Periphyton	10.70		2	6			
	Chlorophyta	0.16	(NS)	6	2			
	Chrysophyta	109.69		2	6			
	Cyanophyta	2064.41		2	6			
	Chlorophyll a	6.51		2	6			
	Ash-free dry weight	0.57		6	2			
Nov 1983	Total Periphyton	8.31		1	6	4	3	5
	Chlorophyta	15.43		4	6	3	5	1
	Chrysophyta	23.29		1	6	5	4	3
	Cyanophyta	3206.52		6	1	4	3	5
	Chlorophyll a*	5.23	(NS)	1	5	6	4	3
	Ash-free dry weight*	5.37	(NS)	1	5	4	6	3
Feb 1984	Total Periphyton	416.71		6	3	4	2	5
	Chlorophyta	0.51	(NS)	5	2	6	4	3
	Chrysophyta	427.58		6	3	4	2	5
	Cyanophyta††							
	Chlorophyll a*	12.65		6	5	4	3	2
	Ash-free dry weight*	5.58		6	5	4	3	2
Jul 1984	Total Periphyton	2.42	(NS)	3	1	2		
	Chlorophyta	1.11	(NS)	3	1	2		
	Chrysophyta	1.78	(NS)	3	2	1		
	Cyanophyta	9.05		1	3	2		
	Chlorophyll a	5.26		2	1	3		
	Ash-free dry weight	8.26		2	1	3		

Table 6-8 (Continued)

Date	Test Parameter	F-Ratio	Student-Newman-Keuls Multiple Range Test Results Low Mean — High Mean
Sep 1984	Total Periphyton	119.95	4 5 3 1 2
	Chlorophyta	40.93	5 4 3 1 2
	Chrysophyta	25.68	4 5 3 1 2
	Cyanophyta	3.79	3 1 4 5 2
	Chlorophyll a	5.61	5 1 4 2 3
	Ash-free dry weight	2.50	1 2 5 4 3
Dec 1984	Total Periphyton	83.47	2 4 5 6 1
	Chlorophyta	63.74	2 4 1 6 5
	Chrysophyta	86.49	4 5 2 6 1
	Cyanophyta	3463.83	2 1 4 5 6
	Chlorophyll a	6.17	1 2 5 6 4
	Ash-free dry weight	10.66	1 2 4 6 5
Mar 1985	Total Periphyton	277.83	6 1 5 2
	Chlorophyta††		
	Chrysophyta	223.76	6 1 5 2
	Cyanophyta††		
	Chlorophyll a	20.64	6 2 5 1
	Ash-free dry weight	5.75	6 5 2 1
May 1985	Total Periphyton	22.22	2 6 1 5 3 4
	Chlorophyta	2.69 (NS)	2 5 6 4 3 1
	Chrysophyta	20.45	2 3 4 5 6 1
	Cyanophyta	0.24	3 5 4
	Chlorophyll a*	3.54 (NS)	5 4 1 6 2 3
	Ash-free dry weight*	25.90	2 6 1 4 5 3
Sep 1985	Total Periphyton	235.57	2 1 3 4 5
	Chlorophyta	10.05	2 4 3 5 1
	Chrysophyta	218.07	2 1 3 4 5
	Cyanophyta	3.07 (NS)	1 5 4 3
	Chlorophyll a*	22.37	2 3 1 5 4
	Ash-free dry weight*	6.24	4 5 1 3 2

Table 6-8 (Continued)

Date	Test Parameter	F-Ratio	Student-Newman-Keuls Multiple Range Test Results Low Mean					High Mean
Dec 1985	Total Periphyton	11.77	5	4	6	2	1	3
	Chlorophyta	8.51	5	4	1	3	6	2
	Chrysophyta	34.06	2	4	5	6	1	3
	Cyanophyta††							
	Chlorophyll a*	9.09	1	2	5	4	3	6
	Ash-free dry weight*	3.46	1	2	5	3	4	6

†1 = TRM 496.5
2 = TRM 506.6
3 = TRM 518.0
4 = TRM 527.4
5 = TRM 528.0
6 = TRM 529.5
*Cells sizes not equal
**Not significant at α=0.05.
††Test could not be done because of lack of adequate sample size or absence of data.

Table 6-9. Results of Two-Way Analysis of Variance and Student-Newman-Keuls Multiple Range Test on Pooled Periphyton Abundance Data By Quarter, Watts Bar Nuclear Plant, Preoperational Monitoring, Chickamauga Reservoir, 1974-1985.

Group	Quarter	Parameter	F-Ratio	Rank (α = 0.05) Lowest							Highest
Station Effect Removed	FEB/MAR	Total Number	1549.30	85	83	84					
		Chlorophyta	5.02	83	84	85					
		Chrysophyta	1589.60	85	83	84					
		Cyanophyta	2.98 (NS)*	84	85						
	MAY/JUN	Total Number	464.84	74	85	76	75	77	82	84	83
		Chlorophyta	62.47	74	77	75	76	85	82	84	83
		Chrysophyta	206.52	74	85	75	76	77	84	82	83
		Cyanophyta	72.60	74	76	77	75	85	84	82	83
	AUG/SEP	Total Number	181.75	74	83	77	82	76	85	84	
		Chlorophyta	92.01	74	83	82	77	85	76	84	
		Chrysophyta	134.04	83	74	77	82	76	85	84	
		Cyanophyta	92.91	77	76	83	82	85	84		
	NOV/DEC	Total Number	620.42	83	77	85	84	82			
		Chlorophyta	365.52	77	83	82	85	84			
		Chrysophyta	293.13	85	83	77	84	82			
		Cyanophyta	26.20	85	77	83	82	84			

Table 6-9 (Continued)

Group	Quarter	Parameter	F-Ratio	Rank (α = 0.05) Lowest					Highest
Year Effect Removed	FEB/MAR	Total Number	977.58	6†	4	5	2	3	1
		Chlorophyta	0.03 (NS)	4	6	3	1		
		Chrysophyta	951.13	6	4	5	2	1	3
		Cyanophyta	2.98 (NS)	3	1				
	MAY/JUN	Total Number	69.21	4	6	5	1	3	2
		Chlorophyta	3.73	4	6	3	5	2	1
		Chrysophyta	32.91	4	6	5	1	3	2
		Cyanophyta	5.77	4	6	5	3	2	1
	AUG/SEP	Total Number	96.42	2	6	4	5	3	1
		Chlorophyta	25.85	2	6	4	3	5	1
		Chrysophyta	74.01	2	6	4	3	5	1
		Cyanophyta	6.27	2	6	3	5	4	1
	NOV/DEC	Total Number	166.45	2	4	3	6	5	1
		Chlorophyta	32.74	3	6	4	2	5	1
		Chrysophyta	172.90	6	2	4	5	3	1
		Cyanophyta	0.44	2	3	1	4	5	6

*NS = Not significant
†1 = TRM 496.5
2 = TRM 506.6
3 = TRM 518.0
4 = TRM 527.4
5 = TRM 528.0
6 = TRM 529.5

Table 6-10. Results of Two-Way Analysis of Variance and Student-Newman-Keuls Multiple Range Test on Pooled Periphyton Abundance Data, Watts Bar Nuclear Plant, Preoperational Monitoring, Chickamauga Reservoir, 1974-1985.

Group	Parameter	F-Ratio	Mean Rank (α = 0.05) Lowest							Highest
Station Effect Removed	Total Number	427.73	74	77	85	83	76	75	84	82
	Chlorophyta	270.94	74	77	83	85	76	75	82	84
	Chrysophyta	253.57	74	85	77	76	83	75	84	82
	Cyanophyta	56.46	77	74	76	75	85	83	84	82
Year Effect Removed	Total Number	268.80	4*	6	5	2	3	1		
	Chlorophyta	55.75	4	6	5	3	1	2		
	Chrysophyta	202.15	6	4	5	2	3	1		
	Cyanophyta	3.93	4	2	6	5	3	1		

*1 = TRM 496.5
2 = TRM 506.0
3 = TRM 518.0
4 = TRM 527.4
5 = TRM 528.0
6 = TRM 529.5

Table 6-11. Correlation Coefficients for Periphyton Total Abundance Data Correlated With Selected Water Chemistry Data and River Flow, Preoperational Monitoring, Watts Bar Nuclear Plant, Chickamauga Reservoir, 1974-1985.

		Nitrogen		Organic Carbon	
River Flow	Alkalinity	Inorganic	Organic	Dissolved	Total
-0.39	+0.08	+0.13	+0.11	+0.13	+0.13

Table 6-12. Minimum and Maximum Station Mean Values by Year for Periphyton Corrected Chlorophyll a, Ash-Free Organic Weight, and Corrected Autotrophic Index, Watts Bar Nuclear Plant, Preoperational Monitoring, Chickamauga Reservoir, 1976-1985.

	Corrected Chlorophyll a (mg/m^2)				Ash-Free Organic Weight (mg/m^2)				Corrected Autotrophic Index			
Year	Minimum	Station*	Maximum	Station	Minimum	Station	Maximum	Station	Minimum	Station	Maximum	Station
1976	33.2	6	64.8	4	5,278	2	20,588	3	124	3	590	3
1977	1.4	5	68.3	3	686	5	5,974	3	70	4	521	5
1982	3.2	2	112.8	3	204	2	20,254	3	83	1	623	6
1983	0.2	5	147.8	3	181	5	13,326	3	74	6	1,194	3
1984	2.2	6	107.9	4	502	6	33,149	3	60	4	3,169	5
1985	0.7	6	112.3	6	186	5	494,173	4	25	4	8,088	2

*1 = TRM 496.5
2 = TRM 506.6
3 = TRM 518.0
4 = TRM 527.4
5 = TRM 528.0
6 = TRM 529.5

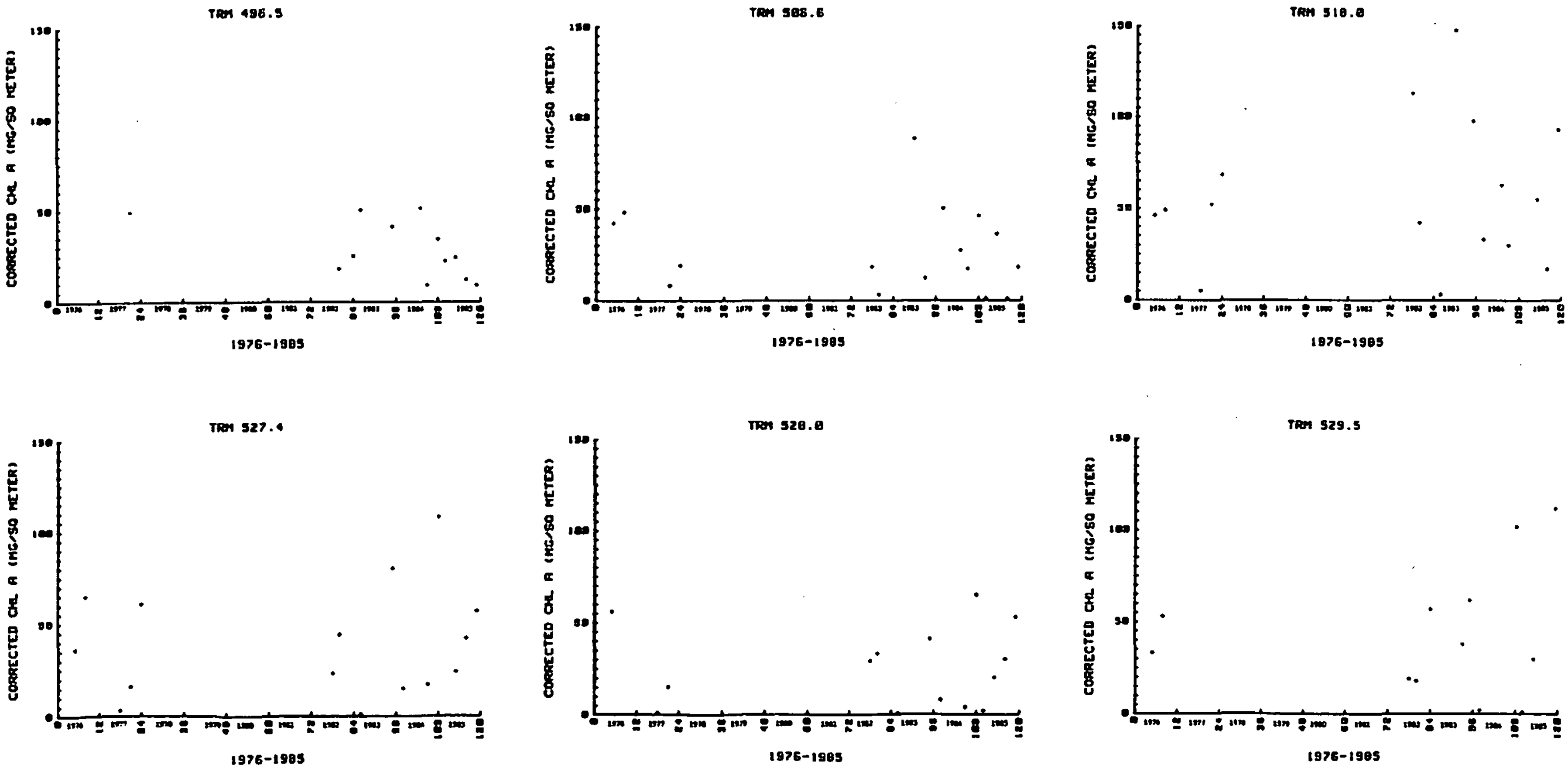


Figure 6-1. Corrected Chlorophyll a Concentrations For Periphyton By Location Surveyed During Preoperational Monitoring, Watts Bar Nuclear Plant, Chickamauga Reservoir, 1976–1985.

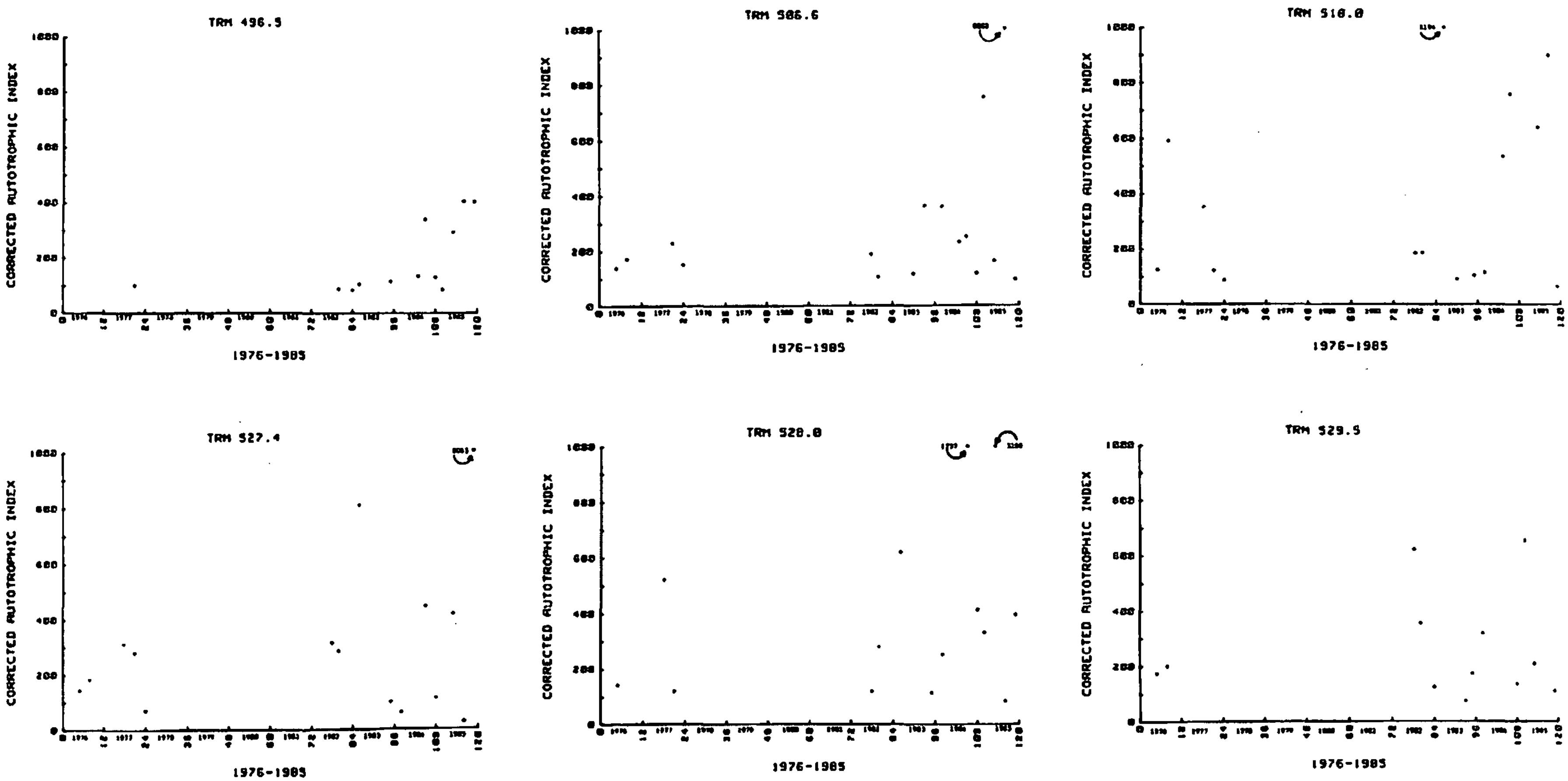


Figure 6-2. Corrected Autotrophic Indices For Periphyton By Location Surveyed During Preoperational Monitoring, Watts Bar Nuclear Plant, Chickamauga Reservoir, 1976-1985.

7.0 BENTHIC MACROINVERTEBRATES

7.1 Community Studies

Benthic aquatic macroinvertebrates are animals that live part or all of their life cycles on or near the bottom of streams or reservoirs. These organisms serve as an important food resource for other forms of aquatic life, especially fish, and studies of their abundance and distribution are useful for detecting major environmental perturbations. Because many have an attached, or sessile, mode of life in the aquatic environmental and are neither subject to rapid migrations nor severe translocation by water mass displacement (except under spate conditions), these organisms reflect exposure history and serve as natural monitors of environmental conditions. Additionally, many species are sensitive to pollution and some have a relatively long and usually complex life cycle of a year or more; hence, their presence or absence and abundance patterns help describe environmental conditions over a period of time.

Evaluation of power plant effects depends upon a good preoperational assessment of "natural" abundance and distribution patterns because macroinvertebrate species composition and population levels respond readily to not only power plant effects but also naturally occurring factors such as availability of food, nature of benthic sediments, flow, reproductive success, spates, proximity of suitable habitats, temperature, and dissolved substances (Hynes, 1970). The most obvious factors in the study reach encompassed in the WBN environmental assessment are current speed and substrate composition, which are closely related. Traveling downstream from WBN, there is an obvious lessening of current velocity which is accompanied by a transition from hard rock and sand to softer, more silty substrates. These factors are expected to greatly affect spatial distributions of macroinvertebrate populations. Additionally, seasonal spates which occur normally during early spring are expected to add considerable temporal variability to the data. Effects of other factors are expected to be more subtle.

7.1.1 Materials and Methods

Field--Several sampling techniques involving two methodologies, artificial substrates and Hess sampler, were utilized to collect benthic macroinvertebrates from upstream (TRMs 496.5-529.5) Chickamauga Reservoir. Artificial substrates have been utilized throughout the entire study (quarterly, spring 1973 through autumn 1985). Use of a Hess sampler and accompanying sediment core sampler was initiated in summer 1983 in the immediate vicinity of WBN (TRMs 521.0-528.8). Hess and core samplers were utilized again during the autumn of 1983 and continued for the same two seasons throughout the study.

Artificial substrates--Sampling stations (figure 7-1) were located at TRMs 496.5, 506.6, 518.0, 527.4, 528.0, and 529.9 from spring 1973 through autumn 1976. Thereafter the upper station was moved downstream to TRM 529.5 because 529.9 was too near Watts Bar Dam and not consistently exposed to river currents. No samples were collected during the winter quarter of 1974. River miles 528.0 (just upstream from the WBN intake) and 529.5 were control stations with 496.5, 506.6, 518.0, and 527.4 (just below WBN diffuser) being the experimental stations.

Field collections of macroinvertebrates were made quarterly from May 1973 to December 1977 and from May 1982 through December 1985 using artificial substrates. Sample collection dates from January-March are referred to as winter quarter, April-June as spring, July-September as summer, and October-December as autumn. Artificial substrates consisted or wire barbeque baskets (volume = 7675 cm^3) filled with river stones of uniform size. Three substrates were placed at each station and a line and float was attached so the substrates could be located easily. During 1973, 1974, and the winter quarter of 1975, substrates were left in the river (colonized) for 90 days. Because of poor recovery percentages due primarily to vandalism, the colonization period was changed to 30 days during the 1975-1977 and the 1982-1985 sampling periods.

During these periods substrates were retrieved primarily by simply pulling them to the surface. Beginning in the winter quarter of 1983, an additional set of three substrates was placed at each station and retrieved by divers placing each substrate in a fine-mesh bag before bringing it to the surface. These samples were used to determine if a significant loss of organisms occurred when substrates were retrieved by pulling them to the surface. Beginning in the summer of 1983, an additional set of three substrates was placed at each station and left for 90 days to provide a basis for comparison of 30-day and 90-day macroinvertebrate collections.

Because of continued loss of samplers due to vandalism, beginning in August of 1983, substrates were anchored to the bottom of the river by attaching them to a piece of steel rail. This allowed their retrieval from the water only by divers even though the marker locating their position was visible.

After retrieving substrates, they were rinsed with water over a standard No. 30 mesh (595 μm) wash screen. Rocks were removed and individually brushed over the screen. All material retained by the wash screen was placed in a container, labeled, and preserved with 10 percent formalin (1973-1977) or 70 percent ethyl alcohol (1982-1985) for laboratory processing.

Hess samplers--Additional macroinvertebrate collections were made using a Hess sampler (area = .0856 m^2) during summer and autumn quarters of 1983-1985 to supplement routinely collected artificial substrate samples. Five stations, TRMs 521.0, 526.3, 527.4, 528.0, and 528.8 were sampled during the summer quarter, 1983 (figure 7-1). After preliminary evaluation of sediment data and a qualitative evaluation of macroinvertebrate data, the sampling location at TRM 526.3 was moved horizontally to an area where the very fine sand component of the substrate would be less and the station at 528.8 was moved downstream to river mile 528.5 to possibly reduce the effect of current and increase the similarity between control stations.

Divers collected 10 samples at each station by pushing the Hess sampler into the river bed and working the substrate to a depth of approximately 15 cm using a hand rake. Dislodged organisms and detritus were carried by the current into a catch cup. All large rocks, mussels, clams, etc., were placed in mesh bags. Collected material was taken to the surface and processed using the same procedures as described for artificial substrates.

Sediment--Sediment samples were collected adjacent to three randomly selected Hess samplers at each station. Samples were collected by divers pushing a core sampler (81.07 cm^2) into the sediment to a depth of approximately 15 cm. After affixing a lid to the sampler, it was gently removed from the substrate and a plate (attached with elastic tubing to the sampler) was placed over the end of the core before it was taken to the surface. Samples were then taken to the laboratory for analysis.

Laboratory--Macroinvertebrate samples were rewashed over a standard No. 30 mesh screen and placed in white enamel trays. Organisms were picked from the remaining detritus and sediments, placed in vials, labeled, and preserved with a solution of 70 percent ethyl alcohol and 5 percent glycerine. Macroinvertebrates were classified to the lowest taxonomic classification practicable and enumerated. Sediment samples were processed through a series of sieves to determine amounts of silt and clay (<0.063 mm), fine sand (0.063-0.25 mm), medium sand (0.25-0.5 mm), coarse sand (0.5-2.0 mm), granule and pebble (2.0-31.0 mm), and larger pebble (31.0-63.0 mm) present in each.

Data Analysis--Loss of prescribed samples and implementation of sampling schemes augmented to enhance sample recovery over the period of monitoring presented special difficulties in the area of data analysis, especially the comparability among stations and years because of unbalanced sample replicability. Also, potential difference in sampling efficiency among the various collection techniques (i.e., substrates colonized 90 days, substrates colonized 30 days, unbagged substrates, bagged substrates, and Hess collections) caused difficulty in an unified approach to assessing temporal and spatial distributions of benthic macroinvertebrates.

To minimize these problems, data were presented to facilitate comparability among sampling techniques. Average seasonal (combined years) total macroinvertebrate abundance and standard errors of the mean were calculated for each sampling technique and sampling location. These data also were plotted to allow visualization of abundance and variability for each technique. In addition, abundance of predominant taxa (defined as $\geq$20 percent of the total at any location for artificial substrate data and $\geq$5 percent of the total for Hess data) were determined and illustrated for each sampling technique.

Artificial substrates--Because of the low recovery rate of artificial substrates and the changing of colonization periods from 90 to 30 days, artificial substrate data were not subjected to analytical procedures such as Sorensen's Quotient of Similarity, diversity, or percentage similarity. Means, standard deviation, minimum and maximum values were calculated for each collection period for total numbers of organisms and the different taxa collected. Because TRM 529.9 was not considered comparable to TRM 529.5, samples collected at 529.9 during 1975 and 1976 (30-day colonization) were not used in any of the calculations or considered as part of the results.

Principle component analysis (SAS, 1982) was performed on seasonal and combined seasons data sets (30-day colonization) to evaluate similarity among stations. Mean densities for each taxon were calculated for each quarter over the entire sampling period and for all quarters combined. These data were then transformed ($\log_{10}$) prior to analysis.

Although Morrison (1967) and Cooley and Lohnes (1971) give good presentations of these statistical features of principle component analysis (PCA), a brief discussion in general terms of its applications to the analysis of these data will be given.

Principle component analysis summarizes the data contained in location-by-taxa data matrix in terms of components that are ordered in terms of the magnitude of their variances. The first principle component having the greatest variance, the second, the next greatest, and so forth. Each component has an associated eigenvalue giving the amount of variance accounted for by each component, and it is customary to extract only enough components to remove the majority of the variance. Sokal and Sneath (1973) suggest that enough components be extracted until 75 percent of the variance is accounted for. Often as few as three components will account for most of the variance. In addition, each component has an eigenvector of component coefficients often called scores giving the weighing of each taxon in each linear component.

In this report principle component analysis was used (in addition to the plots of dominant taxa) primarily to evaluate the similarity among sampling locations rather than to identify specific ecological factors. This similarity, derived from the original river mile-by-taxa matrix and expressed in terms of the first three components, was displayed in a single three-dimensional plot for each season and combined seasons. River miles with similar benthic community structures will form a cluster on the plots.

Total numbers of macroinvertebrates collected using bagged and unbagged methods of retrieval (30-day exposure) were tested for significant differences using Wilcoxon's Signed-Rank and t-test (Sokal and Rohlf, 1969). Total macroinvertebrate data from the 30-day unbagged substrates were plotted by year for each sampling location.

Hess samples--In addition to simple statistics, several other types of analyses were used to evaluate data collected with the Hess sampler. Sorensen's Quotient of Similarity (SQS) (McCain, 1975) and Percentage Similarity (PS) (Pielou, 1975) were used to evaluate similarity among stations based on qualitative and qualitative/quantitative community structure, respectively. A criterion of 70 percent or greater was chosen to indicate similar community structure at stations being compared. Community diversity (D-Bar, diversity index) was calculated according to Patten (1962) and a one-way analysis of variance (ANOVA) and Duncan's New Multiple Range Test (Steel and Torrie, 1960) were used to aid in evaluating station differences (number of taxa present and abundance/m^2) in each quarter. Abundance data were transformed ($\log_{10}$) prior to the analysis.

Sediment--Amounts of various sediment sizes were calculated and used to characterize substrates at each sampling station. Cluster analysis, in addition to plotting, was used to find groupings of stations with similar substrates. The algorithm employed was the unweighted pair-group using arithmetic averages (UPGMA) using the Euclidean distance to examine the stations for natural groupings. An excellent review of the method is given in Sneath and Sokal (1973).

7.1.2 Results and Discussion

Sample Collection--Collection of artificial substrates was hampered by vandalism, spates (which removed substrates from their marked location), and hazardous river flows (which prevented collections by divers). Even after changing from 90-day to 30-day colonization periods to increase collection efficiency, no great improvement was noted until summer 1983 when artificial substrates were first anchored to the bottom by steel rails. A summary of sample recovery during the entire monitoring period is provided in table 7-1 for the three artificial substrate collection techniques and for Hess samples also. Collection efficiencies before and after the anchoring of substrates to the bottom were as follows.

Spring 1973-Spring 1983		Summer 1983-Autumn 1985	
No. Substrates Placed		No. Substrates Placed	
30-day unbagged	282	30-day unbagged	180
30-day bagged	36	30-day bagged	180
90-day unbagged	105	90-day unbagged	162
No. Substrates Recovered (%)		No. Substrates Recovered (%)	
30-day unbagged	161(57)	30-day unbagged	155(86)
30-day bagged	10(28)	30-day bagged	156(87)
90-day unbagged	47(45)	90-day unbagged	131(81)

Considering all three collection techniques together, only 52 percent of the substrates placed from spring 1973 through spring 1983 were recovered. Recovery rate increased to 85 percent during the last part of the study. Recovery rate during 1983-1985 would have been even greater except for an almost complete washout of substrates by unusually high flows in spring 1984.

Observations during sample collection revealed benthic substrates consisting of varying amounts of rock and sand in the immediate vicinity of WBN and the upstream part of the study reach (TRMs 518.0-529.5). These substrates were therefore similar to the rock-filled artificial substrates utilized in this study. However, natural substrates at the two downstream stations (TRMs 496.5 and 506.6) were composed of silt, as was reported by divers who usually found the artificial, rock-filled baskets approximately one-half buried into the substrate after each month's (or three months') colonization period.

During the summer quarter of 1983, divers had difficulty locating artificial substrates at TRM 518.0, resulting in a 14-day delay in retrieval (bagged and unbagged samples) and a 44-day colonization period. All other substrates collected were according to prescribed 30- or 90-day colonization periods.

<u>Comparison of Collection Techniques</u>--Average total macroinvertebrate abundance for each collection technique (table 7-2) is illustrated in figures 7-2 through 7-4 for each season and sampling location along with respective standard errors of the mean. These data indicated no statistical advantage of any particular substrate collection technique (30-day unbagged, 30-day bagged, and 90-day unbagged) because of the large amount of variability within each respective data set over the collection period. A comparison of 95 percent confidence intervals (not shown) would approximately double the degree of overlap among techniques as shown by the standard errors of the mean in figures 7-2 through 7-4. Respective means for the 30-day unbagged, 30-day bagged, and 90-day unbagged data (combined winter, spring, summer, and autumn data for all stations) were 33.9, 74.4, and 68.5 organisms per substrate. Ranges of respective 95 percent confidence intervals were 19.1-48.7, 32.4-116.4, and 27.5-109.5.

Although the entire data set could not be separated (on a statistical basis) into separate populations based upon the three artificial substrate collection techniques, some differences were observed. First, comparison of 30-day bagged and unbagged data showed that the technique of enclosing substrates within a bag before retrieval consistently (45 out of

56 comparisons of paired means) collected more macroinvertebrates. This difference was supported by the non-robust Wilcoxon Signed-Rank test which yielded a standard normal deviate equal to -4.73 and resulted in a $P < .001$, leading one to conclude that the bagged retrieval was superior to the unbagged. This difference is obvious in figures 7-2 through 7-4, comparing closed (bagged) and open (unbagged) circles.

Second, substrates exposed upstream from TRM 506.6 for a period of 90 days in autumn collected many more organisms than substrates exposed for 30 days (figure 7-4). Many of these organisms were rheophyllic insect larvae dominated by trichopterans (caddisflies), especially *Cyrnellus fraternus*. *Cyrnellus* abundance in Watts Bar tailwater proliferated from August through October and emergence was likely completed by November (Brigham et al., 1982). Because 90-day substrates were primarily collected in October and 30-day substrates were not collected until November or December, the difference illustrated in figure 7-4 between the 90- and 30-day collection techniques is strongly biased by time of placement.

Third, different collection techniques yielded different results in terms of abundance and distribution of predominant organisms (tables 7-3 through 7-6, figures 7-5 through 7-8). During the winter quarter (figure 7-5) 30-day bagged substrates surpassed other techniques in collection of the amphipod *Hyalella azteca* and chironomids, while 90-day substrates contained more flatworms (Planariidae and *Dugesia tigrina*). Two trichopterans, *Cheumatopsyche* and *Cyrnellus fraternus*, were predominant on 90-day substrates but not on 30-day substrates. During spring (figure 7-6) 90-day substrates were colonized primarily by chironomids (midge larvae) and Planariidae while the 30-day unbagged substrates were colonized by not only chironomids and Planariidae but also the hydra *Hydra americana*, the benthic cladoceran *Sida crystallina*, and the caddisfly *Cyrnellus fraternus*. The 30-day bagged samples contained the amphipod, *Crangonyx*, especially at TRMs 527.4 and 528.0. This organism was never abundant on unbagged substrates. The midge *Parachironomus* was the predominant organism at TRM 529.5 on 30-day substrates (bagged and unbagged). The most prevalent organism during the summer quarter (figure 7-7) was *Cyrnellus fraternus* in the 30- and 90-day substrates (bagged and unbagged). *Stenacron*, a predominant organism on all artificial substrate types in winter, was only abundant on 90-day substrates in summer. During autumn 90-day substrates contained large numbers of three caddisflies, *Cheumatopsyche*, *Cyrnellus fraternus*, and *Hydropsyche*. One of these, *Hydropsyche*, was not predominant on 30-day substrates.

Abundance data from Hess samples could not be compared to artificial substrate data because Hess data were reported as abundance per unit area (m^2) whereas artificial substrate data cannot be converted and reported on a unit area basis. However, a qualitative comparison was made. The most abundant organism in Hess samples during both summer and autumn quarters (figures 7-7 and 7-8) was *Corbicula manilensis*, a clam which was relatively rare in other collection techniques. Predominant organisms in Hess samples also included aquatic worms (Oligochaeta) and the amphipod *Crangonyx* (autumn only). Hess data were similar to the 30-day substrate data (summer and autumn) reporting large numbers of *Cyrnellus fraternus*. Comparison of coefficient of variation data for all collection techniques (table 7-7) indicates that data derived from the Hess sampler methodology contained much less variability than data representing artificial substrate collections. Additionally, Hess collections included not only *Corbicula* manilensis as the dominant organism, but also other bivalve mollusks such as Amblema plicata, Anodonta imbecillis, Cyclonaias tuberculata, Elliptio crassidens, Obliquaria reflexa, Pleurobema cordatum, and Quadrula pustalosa which were not represented in the artificial substrate data.

Spatial Comparisons--Because of differences among collection techniques and because different techniques were utilized separately and/or together during various parts of the study, a spatial description of macro-invertebrate occurrence considered all techniques with proper regard for sampling effort (30-day unbagged--27 quarters, 30-day bagged--12 quarters, 90-day unbagged--16 quarters, Hess sampler--6 quarters). One hundred and eight macroinvertebrate taxa were identified during preoperational monitoring (table 7-8). Of these taxa, 51 were found exclusively downstream of WBN and 3 were found exclusively upstream (table 7-9). All 3 taxa encountered only upstream of WBN (Coenagrionidae, Neurocordulia yamaskanensis, and Rheotanytarsus) were rare being represented infrequently by only a few individuals. Occurrence of the taxon Coenagrionidae only upstream represents identification to family of a very immature individual likely representing Argia, Enallagma, or Ischnura, all of which were also encountered downstream of WBN. Also, Neurocordulia yamaskanensis and Neurocordulia sp. likely are the same, thus being represented both up and downstream of WBN. None of the 51 taxa listed on table 7-9 as occurring only downstream of WBN were dominant organisms. Occurrence of the mussel taxa Amblema, Anodonta imbecillis, Cyclonaias tuberculata, Fusconaia ebena, Obliquaria reflexa, Plagiola lineolata, Pleurobema cordatum, Pleurobema cordatum pyramidatum, Proptera alata, and Quadrula exclusively downstream of WBN reflects important mussel habitat below WBN. Two species of mussels, Elliptio crassidens and Quadrula pustulosa, which were reported downstream of WBN also occurred upstream, indicating limited mussel habitat existed upstream of WBN. Exclusive occurrence of more taxa downstream of WBN was expected because of greater sampling effort downstream (658 versus 302 samples) and greater downstream habitat diversity. Substrates downstream of WBN included deep silt which was not encountered upstream of WBN.

Seasonal spatial distributions of predominant taxa are provided in figures 7-5 through 7-8. These figures depict spatial results for every collection technique and are discussed below by season. Each seasonal discussion also incorporates results from Principal Component Analysis (PCA) of 30-day unbagged substrate data. Apart from providing supportive information to observations derived from artificial substrate data, Hess data are discussed separately as they represent abundance per unit area (m^2) and are not strictly comparative to artificial substrate data. Hess data also do not represent the entire area sampled by artificial substrates and were collected only during the summer and autumn seasons. Average abundance of organisms collected each sampling period by 30-day unbagged, 30-day bagged, 90-day unbagged, and Hess sampler is provided in respective appendices A through D.

Winter--All three artificial substrate collection techniques indicated a greater macroinvertebrate abundance at TRMs 496.5 and 505.5 than at other sampling locations (see figures 7-2 and 7-5). Predominant taxa at these two downstream locations included Oligochaeta, Planariidae, Hyalella azteca, and Chironomidae. Hyalella azteca was very abundant at TRM 506.6. Predominant taxa at locations upstream of TRM 506.6 (those with rock substrates) included two caddisflies, Cheumatopsyche and Cyrnellus fraternus, the mayfly Stenacron, and the midge Parachironomus.

Many of the predominant winter taxa also were important in the PCA grouping of stations (based on 30-day unbagged substrates) illustrated on three axes in figure 7-9. These taxa (table 7-10) included Hyalella azteca, Oligochaeta, Planariidae, Cheumatopsyche, Stenacron, and Chironomidae. Other taxa important in the PCA analysis included Coelotanypus and Hexagenia. PCA results were similar to those based upon dominant taxa in that the downstream two stations (TRMs 496.5 and 506.6) were separated from all other locations by the first principal component (PRIN 1 representing flow) because of the predominance of the silt tolerant Oligochaeta, Hexagenia, and Coelotanypus and also Hyalella azteca. Both downstream stations were also dissimilar to each other (PRIN 2) because of a greater abundance of Planariidae at TRM 496.5 than at TRM 506.6 and also the absence of Cheumatopsyche at TRM 496.5 which occurred at all other locations. TRM 528.0 was different from all other stations (PRIN 3) because of the simultaneous abundance of Chironomidae, Cheumatopsyche, and Stenacron at that station. Average abundance by sampling location of taxa important to PCA is provided in table 7-10.

Spring--Spatial distribution of macroinvertebrates in the spring was unlike winter (figure 7-2) in that there was a marked increase in abundance from TRM 496.5 to TRM 529.5, especially for Parachironomus, Planariidae, and the amphipod Crangonyx, except that Crangonyx was not abundant at TRM 529.5, immediately downstream of Watts Bar Dam (figure 7-6). The conspicuous absence of Crangonyx at TRM 529.5 may suggest its inability to maintain itself in very swift flows. Its absence in unbagged data may also suggest a tendency to be washed from the rock-filled baskets which were pulled freely to the surface during recovery. Predominant taxa (30-day substrates) also included Oligochaeta, Sida crystallina, Cyrnellus fraternus, and Hydra americana (figure 7-6). Hydra americana occurred in the downstream part of the study reach (TRMs 496.5-518.0) while the netspinning caddisfly Cyrnellus fraternus increased in the upstream area (TRMs 528.0-529.5) where strong currents are prevalent. Cyrnellus fraternus utilizes nets to enhance capture of current-borne foods from a fixed retreat and is epilithic (living on rock substrates) and thus well suited for colonizing substrates in the upstream study reach (Lawrence, 1978). Sida crystallina, a benthic cladoceran, was prevalent in the mid-study reach (TRMs 506.6-528.0).

Predominant macroinvertebrate taxa also were important in the grouping of stations based upon PCA (figure 7-10), in addition to two other taxa: Oecetis (Trichoptera) and Chironomus (table 7-10). PCA results agreed with the spatial comparison based upon dominant (30-day unbagged) taxa in that greater abundance of Parachironomus and Planariidae at TRMs 527.4, 528.0, and 529.5 than downstream and more Hydra americana at TRMs 496.5 and 518.0 than upstream separated the study reach into two distinct areas based upon the first principal component (figure 7-10). Chironomus and Crangonyx were identified as important taxa partly responsible for separating stations based upon the second principal component (figure 7-10), although they were not abundant organisms in 30-day unbagged substrates. (Crangonyx, represented by only a few individuals at TRMs 527.4 and 528.0 in 30-day unbagged data [table 7-10] was the most abundant organism at the same two stations in 30-day bagged data [figure 7-3].) Chironomus, Crangonyx, and Sida crystallina were simultaneously abundant only at TRM 527.4 and absent at TRM 496.5 while Oligochaeta was most abundant at TRM 496.5 and relatively scarce at TRM 527.4, resulting in the separation of stations based upon the second principal component. Greatest abundance of _Sida crystallina_ at TRM 518.0 and _Crangonyx_ at TRMs 527.4 and 528.0 was largely responsible for separation of these two stations based upon the third principal component.

Summer--Macroinvertebrate abundance increased from downstream to upstream in all three artificial substrate collection techniques (figure 7-3). Predominant taxa were _Cyrnellus fraternus_, Oligochaeta, Chironomidae, _Dugesia tigrina_, _Cheumatopsyche_, _Dicrotendipes_, and _Stenacron_ (figure 7-7). _Cyrnellus fraternus_, the netspinning caddisfly, occurred in great abundance in the upstream study area (TRMs 527.4, 528.0, and 529.5). The habitat most favorable to _Cyrnellus fraternus_ and least favorable to Oligochaeta apparently occurred upstream of TRM 527.4 (figure 7-7, Hess sampler). _Cheumatopsyche_, Chironomidae, and _Dicrotendipes_ were most abundant upstream at TRM 529.5.

Results from PCA (PRIN 1) separated the two downstream stations from the upper study reach (TRMs 518.0-529.5) based mainly upon upstream abundance of Chironomidae and the three caddisfly taxa _Cyrnellus fraternus_, _Cheumatopsyche_, and _Hydropsyche_ (figure 7-11, table 7-10). TRM 529.5 was most different from downstream stations, having the greatest abundance of three of the four important taxa (_Cyrnellus fraternus_ was more abundant at TRM 527.4, table 7-10). This type distribution of taxa agrees with habitat conditions (substrate and flow) in the area of preoperational monitoring and with ecology of the trichopteran taxa. Dissimilarity between TRM 527.4 and 528.0 (figure 7-11) based upon PRIN 2 resulted from relative abundance of _Cyrnellus fraternus_ and scarcity of _Dicrotendipes_, _Parachironomus_, and

Dugesia tigrina at TRM 527.4 compared with TRM 528.0. Separation of stations based upon PRIN 3 resulted from a comparatively large abundance of all three important taxa at TRM 518.0 and two of three important taxa at TRM 496.5 (figure 7-11, table 7-10).

Autumn--Colonization period and/or time of substrate placement apparently were factors during the autumn as Hess (natural substrate) and 90-day substrate samples, representing long-term colonization (early autumn), both contained similar numbers of organisms and appreciatively greater numbers than short-term 30-day bagged and unbagged samplers (late autumn) upstream of TRM 506.6 (figures 7-4 and 7-8). Spatial distribution of rheophilic caddisflies, like summer, were concentrated in the upstream study reach (TRMs 518.0-529.5). These taxa included Cheumatopsyche, Cyrnellus fraternus, and Hydropsyche. Strong currents apparently are important to those trichopteran taxa as greatest abundance occurred nearest the Watts Bar Dam (all collection techniques). Greatest average abundance of Stenacron measured during the study (48.9 per substrate) occurred in autumn at TRM 527.4. Maximum abundance of Crangonyx (79.6 per m^2) occurred in autumn in the upstream study area (TRM 528.0). Abundance of Cyrnellus fraternus (90-day substrates and Hess data) at TRMs 527.4, 528.0, and 528.5 was greater than populations in summer with maximum densities occurring at TRM 528.0 (426 per m^2), TRM 528.5 (416 per m^2), and TRM 529.5 (170 per 90-day substrate). Like summer, increase during autumn of Cyrnellus fraternus at upstream locations coincided with a decrease of Oligochaeta. The most abundant organism in the upstream study area (Hess data) was the clam Corbicula manilensis.

Although 30-day unbagged substrates yielded relatively few organisms (compared to 90-day unbagged substrates and Hess samples), the first principal component (figure 7-12, PRIN 1) still separated stations in an upstream/downstream fashion. This grouping was based upon occurrence of <u>Coelotanypus</u> and the silt tolerant <u>Hexagenia</u> and Oligochaeta in the downstream study area (TRMs 496.5 and 506.6) and their relative scarcity upstream and also upon increased numbers of <u>Stenacron</u> upstream (table 7-10). TRM 529.5 was very different from other upstream stations (PRIN 3) because of a greater abundance of <u>Cheumatopsyche</u> and few <u>Stenacron</u> at that station compared to TRMs 528.0 and 527.4. However, <u>Cheumatopsyche</u> occurred in large numbers during early autumn as far downstream as TRM 518.0. <u>Stenacron</u> abundance was mainly responsible for the distinction among stations based upon PRIN 2.

Combined Seasons--A Principal Component Analysis was performed on 30-day uncovered substrate data to evaluate overall location similarities based upon macroinvertebrate abundance and community composition for combined seasons. Many of the taxa important to the seasonal results were also included in the overall comparison: <u>Cyrnellus</u> <u>fraternus</u>, Oligochaeta, <u>Sida</u> <u>crystallina</u>, <u>Hydra</u> <u>americana</u>, <u>Stenacron</u>, <u>Cheumatopsyche</u>, <u>Parachironomus</u>, <u>Hydropsyche</u>, and Planariidae (table 7-10). The first three principal components as illustrated by the spatial grouping of stations (figure 7-13) accounted for 87 percent of the variability. The first component (PRIN 1) which accounted for over 60 percent of the variability separated stations in an upstream/downstream fashion because of the relative absence of rheophyllic taxa (<u>Hydropsyche</u>, <u>Cheumatopsyche</u>, <u>Parachironomus</u>) and abundance of silt-tolerant Oligochaeta at TRMs 496.5 and 506.6.

Stations TRM 518.0 and TRM 529.5 were polarized (very different) (PRIN 2) based upon relatively large numbers of Hydra americana and Sida crystallina at TRM 518.0 and their absence at the upstream station. Sampling locations at TRMs 527.4 and 528.0 were different from other stations (PRIN 3) because of a greater abundance of Stenacron than at TRMs 529.5, 496.5, and 506.6 and more Cyrnellus fraternus than TRMs 496.5-518.0 (table 7-10).

Conclusions based upon a single collection technique should be made with caution because of large amounts of missing data throughout the study period and because of some rare taxa utilized in the PCA results. For example, Sida crystallina was a predominant organism during spring at river miles 506.6, 518.0, and 527.4 (table 7-3); however, this organism only occurred in large numbers during 1976 and 1977. Missing samples at any river mile during those years (table 7-1) would strongly affect any results based upon mean numbers. However, it is clear that changes in habitat occurred from the immediate vicinity of WBN downstream to TRM 496.5, such that various descriptions of station differences were based upon occurrence of rheophillic, epilithic taxa near the plant site and taxa adapted to slower current and soft substrates in the downstream study reach. The most obvious points in the reservoir where these changes occurred were in the vicinity of TRM 527.4 and downstream of TRM 518.0.

Hess Data--Summer and fall Hess and sediment core samples were collected in 1983 to better characterize macroinvertebrate communities near WBN (TRMs 521.0-528.8). Three of the fifty-nine taxa collected, Corbicula manilensis, Cyrnellus fraternus, and Oligochaeta, comprised approximately 85 percent of the total community in summer and autumn. The clam Corbicula manilensis was most abundant summer and autumn throughout the study area. The caddisfly Cyrnellus fraternus was abundant especially upstream of TRM 526.3 and was subdominant in autumn. Four predominant taxa (comprising ≥5 percent of the total abundance at any location) in summer and 4 in autumn (table 7-6) comprised 89 percent of the total abundance.

An average of 11 and 12 taxa per station were collected respectively in summer and autumn 1983. Average taxa per station in 1984 and 1985 ranged from 15 to 18 and were significantly greater ($\alpha = 0.001$) than those collected in 1983. Greatest number of taxa collected at a single station was 24 during summer 1985 at TRM 521.0.

During summer, 21 of 30 station comparisons expressed as SQS (table 7-11) were less than the 70 percent criterion selected to indicate similarity, meaning that communities at these stations were composed of different taxa. Similarities measured in 9 comparisons were inconsistent from year to year. However, comparisons based upon organism abundance and taxonomic occurrence were mostly similar (20 of 30 comparisons having PS values greater than 70 percent). Total dominance by Corbicula manilensis at all stations accounted for much of this similarity. TRM 528.0 (immediately upstream of WBN) and TRM 521.0 (downstream) were similar every year (1983, PS = 84 percent; 1984; PS = 81 percent; 1985, PS = 70 percent). TRM 528.5 (upstream, not sampled in 1983) and TRM 527.4 (immediately downstream) were similar in 1984 (PS = 95 percent) and 1985 (PS = 82 percent). TRM 528.5 also was similar to TRM 521.0 in 1984 (PS =73 percent) and 1985 (PS = 71 percent). Similarities among other stations were inconsistent during the monitoring period.

Both SQS and PS comparisons of TRM 526.3 with upstream stations in summer 1985 were consistently very low (table 7-11). Several silt-tolerant taxa such as <u>Hexagenia</u>, <u>Chironomus</u>, <u>Branchiura sowerbyi</u>, Chironomidae, and Tubificidae were abundant at TRM 526.3 (appendix D), accounting for the low index values. Sediment data (appendix E) indicate an atypically large amount of silt at the TRM 526.3 sampling location in summer 1985.

Autumn SQS data were similar to summer in that most (20 of 30) comparisons based upon taxonomic structure were not similar. The 10 comparisons which indicated similar taxa among stations were again inconsistent (i.e., two stations were similar one year but not all years). Percent similarity data identified similar communities at 18 of 30 comparisons, again demonstrating the strong influence of <u>Corbicula manilensis</u> abundance upon the comparison. Several stations had autumnal PS values greater than 70 percent during every year: TRMs 528.5 and 528.0, TRMs 528.5 and 527.4, TRMs 527.4 and 521.0, and TRMs 526.3 and 521.0. The range of SQS and PS values for both summer and autumn are listed below.

Comparison (TRM)	Summer SQS (%)	Summer PS (%)	Autumn SQS (%)	Autumn PS (%)
528.5-528.0	60-74	69-90	59-74	75-90
528.5-527.4	69-72	82-95	61-93	73-81
528.5-526.3	45-65	51-95	58-73	61-76
528.5-521.0	56-67	71-73	57-76	60-75
528.0-527.4	65-85	66-81	57-65	62-85
528.0-526.3	43-60	48-82	55-71	51-80
528.0-521.0	52-67	70-84	45-73	52-79
527.4-526.3	55-69	47-94	58-73	78-95
527.4-521.0	59-77	63-74	55-75	67-93
526.3-521.0	67-74	57-95	52-73	74-93

Comparison of stations based upon analysis of variance for total macroinvertebrate abundance (table 7-12) showed all stations in summer 1983 were alike except for a highly significant difference ($P>F = 0.0002$)

at TRM 527.4 where a greater than 50 percent reduction in the dominant organism, Corbicula manilensis, occurred. Stations differences were observed in summer 1984 when total abundance was again tied closely to abundance of Corbicula manilensis. In summer 1985, abundance of macroinvertebrates at TRM 526.3 greatly surpassed abundance at other stations (table 7-13, figure 7-14), primarily because of greater Corbicula manilensis abundance and exceptionally large numbers of the silt tolerant midge, Chironomus (540 per m^2). Sediment core samples collected concurrently with macroinvertebrate sampling contained an average of 18.5 grams (dry weight) silt/clay, representing a non-target substrate type. Macroinvertebrate samples at TRM 526.3 also contained other silt-preferring organisms such as Branchiura sowerbyi, Tubificidae, Hexagenia, and Chironomidae which were not present or abundant at other stations (appendix 7-D).

During autumn, no significant differences were identified among stations in 1983 and 1985. In 1984, total abundance in autumn was greater upstream of TRM 526.3, resulting from a large increase in the caddisfly, Cyrnellus fraternus, and the amphipod, Crangonyx. In autumn 1984, Cyrnellus fraternus was the dominant organism at TRMs 528.0 and 528.5. Lack of significant station differences during autumn 1983 and 1985 was due to greater downstream abundance of Corbicula manilensis than upstream which canceled the effect of more Cyrnellus fraternus upstream.

Community diversity index was low (<2.50) at all stations and frequently below 1.00, especially downstream of TRM 528.0 (table 7-14). Low diversities generally reflected complete dominance by Corbicula manilensis at most stations. Greatest diversity (index = 2.20) occurred at TRM 527.4 during autumn 1985 when only about 53 percent of the total abundance was composed of Corbicula manilensis and 31 percent of the remaining 47 percent was almost evenly divided between two other taxa, Cyrnellus fraternus and Dugesia tigrina (Planariidae) (appendix D).

Sediment results (appendix E, figures 7-15 through 7-17) indicated sampling stations were most similar with regard to the 2-31 mm particle-size category representing granule and pebble-size rocks. This was also the dominant sediment type with regard to weight. Station substrates were less uniform with regard to other particle-size categories, especially fine sand. Benthic substrates at TRM 526.3 contained much greater amounts of fine sand than at other stations. Lotic condition downstream of Watts Bar Dam restricts deposition of silt and clay (<.063 mm category); however, surprisingly large amounts of silt and clay were measured at TRM 528.5 in summer 1984 and especially at TRM 526.3 in summer 1985 where up to 36 grams of silt/clay were collected. Substrates also varied greatly with regard to the 31-63 mm sized pebbles. These rocks were present at most stations in 1983, but completely missing at many stations during 1984-85.

Clustering of stations based upon overall sediment composition (figures 7-18 and 7-19) showed the upstream stations (TRMs 528.8 or 528.5 and 528.0) and the station immediately downstream of WBN (TRM 527.4) were more similar than other stations during summer. However, TRM 528.0, immediately upstream of the diffuser, was much different during autumn. TRM 526.3 was different from all other stations every sampling period except autumn 1985 when much smaller quantities of fine sand were collected than in other surveys. Presence of more fine sand and silt/clay at TRM 526.3 than at other stations resulted in increased abundance of Oligochaeta, Chironomus (figures 7-7 and 7-8), and other silt tolerant organisms over other stations.

Temporal Comparisons--Thirty-day unbagged substrate data comprise the only continuous data base (winter 1975-winter 1984) from which temporal comparisons can be made. However, missing substrates during this period limited the definition of any long-term trends. These data (table 7-15, figure 7-20) indicated the following for each season.

During winter macroinvertebrate abundance at the two most downstream stations (TRMs 496.5 and 506.6) was much greater than other stations, especially since 1983. The increase involved primarily Chironomidae, Coelotanypus, Hexagenia, Hyalella azteca, Oligochaeta, and Planariidae (appendix 7-A). Abundance at other stations increased during 1984 and 1985, equaling population levels measured in 1975.

In spring macroinvertebrate abundance was greatest at TRM 518.0 during 1976 and 1977 (involving primarily Hydra americana and Sida crystallina), but was reduced during 1975, 1982, 1983, and 1985 (substrates were not collected in 1984 because of extreme flooding). Abundance was also high in 1977 at TRM 506.6 (Sida crystallina) and TRM 527.4 (Chironomus, Corbicula manilensis, and Sida crystallina). Maximum abundance during the spring season occurred in 1982 at TRM 529.5 (Chironomidae, Glytotendipes, Parachironomus). Spring substrates were not recovered from TRM 529.5 during other years except in 1985, when abundance was also greater than at other stations. Maximum abundance at TRM 528.0 also occurred during 1985 (Planariidae, Cyrnellus fraternus, Crangonyx, and Amnicola).

Macroinvertebrate abundance was exceptionally high in summer during 1984 and to some extent in 1983 at stations primarily affected by strong currents (upstream of TRM 506.6) (figure 7-20). Organisms responsible for this increase were Stenacron, Dugesia tigrina, Chironomidae, Cheumatopsyche, Hydropsyche, and especially Cyrnellus fraternus. The only factor unusual about 1984 was a large spate (figure 2-15) which occurred and persisted through much of May. A much smaller spate also occurred in May 1983. Increased macroinvertebrate abundance of the above taxa likely was associated with the unusual early summer flows, although the mechanisms for this effect were not studied. Little is known about the ecological effects of such natural disturbances in streams (McAuliffe, 1983). Likely mechanisms include (1) increased macroinvertebrate drift and subsequent recolonization, (2) disruption of established competitive structures, (3) greater food availability, and (4) creation of larger microhabitats (niches) through removal of finer substrate types. A similar high flow event occurred in June 1973; high abundance of Cyrnellus fraternus and Cheumatopsyche was observed on 90-day substrates collected in November of that year.

In autumn maximum abundance at TRM 518.0 occurred in 1975 (Oligochaeta). Maximum abundance occurred in 1983 at TRM 506.6 (Planariidae). Abundance at the four upstream stations declined in 1985, a low flow year (figure 2-16).

As described above, yearly abundance patterns depended upon sporadic occurrence of various dominant taxa. Major occurrences of these taxa are summarized below.

Taxa	Year	Season
Cyrnellus fraternus	1975	Summer
	1976	Autumn
	1982	Summer
	1983	Summer
	1984	Summer
	1985	Summer
Sida crystallina	1976	Summer
	1977	Spring
Hydra americana	1976	Summer
Oligochaeta	1977	Autumn
	1984	Summer
Hyalella azteca	1982	Spring
	1983	Winter
	1984	Winter
Planariidae	1983	Autumn
	1984	Winter
	1985	Spring
Stenacron	1983	Summer
		Autumn
	1984	Summer

As indicated Sida crystallina and Hydra americana were prominent during the early preoperational period (1975-1977) while Hyalella azteca, Planariidae, and Stenacron were prominent in more recent years (1982-1985). Cyrnellus fraternus was prominent during summer or autumn throughout the study.

7.1.3 Summary and Conclusions

Benthic macroinvertebrates in the vicinity of WBN (TRMs 496.5-529.5) were sampled quarterly from spring 1973 through autumn 1977 and spring 1982 through autumn 1985, utilizing a variety of collection techniques involving two methodologies, rock-filled artificial substrates and a Hess sampler. The use of various collection techniques was necessary to (1) enhance sample recovery of artificial substrates which were missing following 90-day colonization periods, (2) provide additional quantitative information regarding substrate and macroinvertebrates in the more immediate vicinity of WBN (TRMs 521.0-528.8), and (3) evaluate comparability of data resulting from the different sample types.

It was found that changing from 90-day to 30-day colonization periods did not appreciably enhance artificial substrate recovery. However, anchoring of substrates to the river bottom, beginning in August 1983, such that recovery could be made only by divers, greatly improved collection efficiency (from 52 percent to 85 percent) and increased the comparability among stations.

Different collection techniques demonstrated different sampling efficiencies depending upon location and season. Most notable was that (1) bagged artificial substrates regularly collected significantly more macroinvertebrates than unbagged, and (2) collection techniques representing long-term colonization (90-day substrates and Hess sampler) collected a greater variety and many more macroinvertebrates during autumn than those utilizing a shorter (30-day) colonization time. However, it appeared that time of placement for short-term exposure in late autumn selected against collecting abundant organisms. Also, various collection techniques yielded different results in terms of abundance and distribution of predominant organisms. Hess sampling was the only methodology to identify the clam *Corbicula manilensis* as the dominant organism upstream of TRM 521.0 and to collect several species of mussels.

Though conclusions based independently upon each collection technique conflict (because of differences in collecting ability), utilization of the complete data base provided definitive information regarding spatial occurrence and abundance of macroinvertebrates near WBN. Changes in current velocity and substrate greatly affected macroinvertebrate distribution. A large number of taxa (51) occurred only downstream of WBN where greater habitat diversity occurs due to a lessening of current velocity and a change from predominately rock substrates to soft silt and clay, especially at the two downstream most stations (TRMs 496.5 and 506.6). None of these 51 taxa represented predominant organisms and many were only rarely collected or likely represented very immature forms of taxa found upstream. The large number of taxa exclusively downstream of WBN occurred because of greater downstream habitat diversity and sampling effort (658 downstream samples and 302 upstream).

In addition to population differences up- and downstream of the WBN diffuser, the entire study reach was separated into three areas based upon occurrence and abundance of specific taxa. The area upstream of TRM 526.3 (beginning at TRM 527.4) was especially suited for caddisfly taxa (Cyrnellus fraternus, Cheumatopsyche, Hydropsyche) and certain midges Dicrotendipes, Parachironomus). The mid-study area (TRMs 518.0, 527.4, and 528.0) contained greatest abundance of the benthic cladoceran Sida crystallina, the amphipod Crangonyx, and the mayfly Stenacron, and also many Cheumatopsyche (caddisflies). The downstream study area (TRMs 496.5 and 506.6) was especially colonized by aquatic worms (Oligochaeta), the amphipod Hyalella azteca, midges (Coelotanypus and Chironomus), the mayfly Hexagenia, and Hydra americana. The clam Corbicula manilensis occurred as the predominant taxon at TRM 521.0 and upstream (Hess data). This taxon likely was dominant or present in large numbers downstream of TRM 521.0 but was not documented as such because of the inability of artificial substrates to accurately represent its abundance.

Temporal changes were obvious over the study period. Sida crystallina and Hydra americana were prominent early in the study (1975-1977) while Hyalella azteca, Planariidae, and Stenacron were prominent in more recent years (1982-1984). This change likely reflects flow conditions during sampling, rather than a change in the ecology in this portion of Chickamauga Reservoir. Cyrnellus fraternus was prominent during summer and autumn throughout much of the entire study.

Occurrence of spates during early summer of several years greatly influenced (increased) abundance of several rheophyllic taxa during subsequent late summer (30-day data) or early autumn (90-day data) seasons. Operational evaluation of WBN influence upon macroinvertebrates should not be made apart from considering the important factor of flow which controls both occurrence and abundance of numerically important taxa.

The overall study indicates a diverse, abundant macroinvertebrate fauna in the study area upstream and downstream of WBN. Because of their abundance and occurrence in more recent years, Cyrnellus fraternus, Hyalella azteca, Planariidae, Stenacron, and Corbicula manilensis appear best suited as target organisms for operational studies at WBN.

7.2 Freshwater Mussels

The freshwater mussel (Bivalvia: Unionacea) component of the macrobenthic community is considered separately for several reasons. These animals are unique among benthic invertebrates in terms of attained size (up to 180 mm in length), age (40 years is not uncommon in several species), and complexity of their life cycle (including obligate parasitism, typically on specific fish species). Because of their large size, sedentary nature, and tendency to occur clumped in areas of suitable habitat ("mussel beds"), these animals cannot be accurately sampled using typical benthic sampling techniques. Appropriately sampled and examined, however, these animals can provide substantial information on present and past quality of an aquatic habitat--often including variations around some point of aquatic disturbance.

Historic and archaeologic records indicate that the Tennessee River once contained an extremely diverse and abundant freshwater mussel fauna. In a classic study of this fauna, Ortmann (1918) discussed 88 species and recognized forms which had been found in the Tennessee River system upstream from Chattanooga. Approximately half of these species occur throughout much of the Ohio and Mississippi River systems. The remaining species are more or less restricted to upstream portions of the Tennessee and Cumberland River systems and have been recognized as the "Cumberlandian" faunal group (Ortmann, 1924). Many taxonomic and nomenclature changes have occurred with regard to freshwater mussels; however, current species concepts still indicate that approximately 90 species once were present in the Tennessee River (Parmalee, Klippel, and

Bogan, 1982), including 36 Cumberlandian species. In the following paragraphs, species names from all surveys are presented using only their updated synonyms. While these names may not appeal to all current workers in this area of specialization they are sufficient to identify the biological entities being discussed in this baseline ecological study.

The reach of the Tennessee River included in this study generally is restricted to Tennessee River Miles (TRM) 479 through TRM 529. This reach of large river meanders southwest from near Spring City (Rhea County) toward Chattanooga (Hamilton County, Tennessee). The dams in the reach have substantially altered the river. Chickamauga Dam (TRM 471.0), closed in 1940, impounds 58.9 miles of the river to the base of Watts Bar Dam. Watts Bar Dam (TRM 529.9), which impounds 72.4 miles of the Tennessee River, was closed in 1942. An eleven foot deep (minimum) navigation channel has been maintained in these reservoirs since 1945.

7.2.1 Survey Methods

Preimpoundment Fauna

The preimpoundment freshwater mussel fauna of the Tennessee River was not studied in sufficient detail before the dams were built to satisfy modern statistical interests. However, early distribution records in conjunction with recent work on aboriginal shell middens, provide a preimpoundment species list accompanied by some relative abundance estimates. Aboriginal shell midden material has been studied by Parmalee, Klippel and Bogan (1982) and more recent material (1850-1918) was evaluated by Ortmann (1918). Table 7-16 indicates that 45 identifiable species were found in the shell middens and 58 species (current interpretations) were included on the 1850-1918 list. These lists suggest that 64 species of freshwater mussels probably occurred near the WBN site before the Tennessee River was affected by substantial human impact, primarily impoundment. Twenty-two of these species are members of the Cumberlandian faunal component (Ortmann, 1924). Quantitative data from the shell midden study (Parmalee, et al., 1982) indicate that the five most abundant species were Dromus dromas (35.25 percent), Elliptio dilatatus (11.36 percent), Actinonaias ligamentina (7.49 percent), Elliptio crassidens (6.11 percent) and Pleurobema plenum (5.58 percent). Together, these five species made up about 66 percent of the community.

Postimpoundment Fauna

Surveys of freshwater mussel stocks near WBN after Chickamauga and Watts Bar reservoirs were filled, fall into two groups: three localized studies or spot checks conducted between 1956 and 1972, and three intensive assessments conducted between 1975 and 1985. Each of these surveys had its own purpose, area of coverage, sampling techniques and intensity of effort.

A U.S. Fish and Wildlife Service study conducted in 1956-1957 (Scruggs, 1960) was primarily concerned with a single commercial mussel species (Pleurobema cordatum). Scruggs examined brail boat catches and performed some scuba searches "near TRM 515" in addition to his primary surveys further downstream (on Wheeler Reservoir). The quantitative data from this study included in table 7-16 are derived from a table of commercial crowfoot bar catch records (Scruggs, 1960:11). The high percentage of P. cordatum in this data set either reflects a substantial sampling bias by the mussel fishermen or the actual composition of beds that "were discovered in 1956 and had been fished for only 5 months" (Scruggs, 1960:7).

In 1964, Isom conducted an extensive dredge survey of the upper river channel in Chickamauga Reservoir (TRM 471-529) as part of an assessment of mussel resources in the Tennessee River (Isom, 1969). The 300 three-square-foot samples taken in this river reach produced the species list and relative abundance estimates included in table 7-16.

Bates (1975) used brailing, ponar sampling, and hand collecting techniques in a study of mussel resources on overbank areas and in the immediate tailwaters of Tennessee River dams. Near WBN, this survey included the area just downstream from Watts Bar Dam (TRM 529.9) and TRM 481-511. Because quantitative information is not included in this report for the hand collecting technique and so few other specimens were found (21), only indications of live occurrences are recorded in table 7-16.

These three surveys include records for 22 mussel species, eleven of which were only reported by Scruggs. Bates alone reported the occurrence of Anodonta grandis (in his report as A. corpulenta). None of the species found in these surveys are members of the Cumberlandian faunal group. Quantitative data from two of these surveys (Scruggs, 1960; Isom, 1969) suggest that Pleurobema cordatum was the most abundant species (74 and 31 percent respectively), followed by Elliptio crassidens (13 and 19 percent), Quadrula pustulosa (2 and 11 percent) and Cyclonaias tuberculata (2 and 13 percent). Quadrula metanevra made up 2.9 percent in the 1956-1957 survey but was not found in the quantitative work in 1965.

The three most recent and most intensive assessments in the vicinity of the WBN were conducted by TVA during siting surveys or as part of the WBN preoperational monitoring program. Previously accumulated information and the results of preliminary sampling (conducted in 1971 and 1972) led to a series of five qualitative and/or quantitative collections in July 1975 through August 1977 between TRM 520.5 and 528.5. Brailing and random scuba dives were used to document species occurrence while density was assessed by taking square meter quadrat samples. Composite results of these collections are included in table 7-16.

In 1978, TVA conducted an extensive survey of mollusc resources downstream from all nine Tennessee River mainstream dams (Gooch, Pardue and Wade, 1979). This survey consisted of several hundred timed scuba dives at specific locations. In the WBN reach, 55 dives were made between TRM 514.2 and 528.9. Data from these dives are summarized in table 7-16 and the numbers of species identified at each site are indicated on figure 7-21. Upper Tennessee River data from this survey also have been presented by Pardue (1981).

These surveys confirmed the continued existence of the species and community structure indicated by the less intensive surveys from the 1950's, 1960's and early 1970's. The 1978 survey also provided valuable information on the present distribution of species in the vicinity of WBN. These data formed the basis for mussel sections in the NRC Environmental Statement on WBN (NRC, 1978) and in the initial WBN Preoperational Monitoring Report (TVA, 1980b).

<u>1983-1985 Preoperational Assessment</u>

In 1983, detailed sampling of freshwater mussel concentrations was initiated at TRM 520-521L (along the Left descending bank), 526-527R and

528-529L (figure 7-22). The most upstream of these beds (TRM 528-529L) is located on the opposite side of the river and upstream from the WBN construction site and discharges. The middle bed (TRM 526-527R) is on the same side of the river as WBN and is just downstream from Yellow Creek and all WBN discharges. The downstream bed (TRM 520-521L) is six river miles downstream from WBN and is located on the opposite side of the river. All three beds exist on submerged gravel and cobble bars approximately 10 to 20 feet deep.

Linearly-arranged sampling stations were established on each of these three beds (figure 7-22). Each sampling station was located as precisely as possible using river mile markers, navigation buoys and bankside landmarks. Each station was sampled once in summer and once in autumn (1983-1985) by scuba divers. All freshwater mussels (thus excluding the Asiatic Clam, Corbicula sp.) encountered in eleven minutes of bottom time were picked up. All mussel specimens were brought to the dive boat where they were sorted by species and counted. On each sampling visit, up to 50 specimens of each species from each bed were measured in three dimensions (length, height and thickness). All specimens were returned to the station from which they were collected.

7.2.2 Results and Discussion

Species Composition and Abundance--Composite results from the 1983-1985 assessment are included in table 7-16. In general, the list of species and relative abundance values are similar to the data from 1975-1977 and 1978. Five species were encountered in 1983-1985 that had not been found in other recent assessments (Anodonta imbecillis, Fusconaia maculata, Lasmigona complanata, Pleurobema plenum and Ptychobranchus fasciolaris). Of the composite total of 28 species found during these three surveys, only Pleurobema oviforme and Dromus dromus are members of the Cumberlandian fauna. Elliptio crassidens was consistently most abundant (42-64 percent), followed by Pleurobema cordatum (12-15 percent), Quadrula pustulosa (6-17 percent), Cyclonaias tuberculata (5-10 percent), and Plagiola lineolata (2-5 percent), typically in that order. The only deviations from this relative abundance order were the transposition of P. cordatum and Q. pustulosa in the 1975-77 data set and the replacement of Plagiola lineolata by Potamilus alatus in the 1983-85 data set. Considered together, these five species account for 89 to 93 percent of the mussel community.

Survey results from 1956 through 1985 suggest that the extant fauna consists of approximately 30 species, five of which account for roughly 90 percent of the individuals present. Differences in the lists of most abundant species found during this 30-year period suggests that the composition of this mussel community still has not stabilized in this river reach.

The data from various surveys presented in table 7-16 indicate that approximately 35 freshwater mussel species have disappeared from the WBN reach of the Tennessee River since the beginning of the twentieth century. Results from surveys conducted between 1956 and 1972 suggest that most of these species were gone by the mid-1950's. Data do not exist to establish the cause for this loss in mussel diversity; however, it is logical to assume that the extensive modifications of riverine habitat, which occurred when Chickamauga and Watts Bar reservoirs were formed (1940 and 1942), resulted in adverse impacts to the mussel fauna.

Some type of abundance information was collected during each survey from 1956 to 1985. Unfortunately, variations in sampling techniques and areas of coverage make comparison of the data difficult.

Catch-per-effort values from several surveys are presented in table 7-17. The most random technique (Isom, 1969) recorded the second lowest density (0.22 specimens per m^2) and the fewest species (7). Lowest density estimates (0.07 mussels per m^2) came from the 1957 crowfoot bar brailing survey (Scruggs, 1960) which was conducted in conjunction with a scuba-assisted quadrat survey. Species records were comparable between these two techniques (16 and 17 species) but the high density estimate from the quadrat survey (19.97 mussels per m^2) indicated the relative inefficiency of brailing. The 1975-1977 survey also employed scuba-assisted quadrat sampling and included records for 15 species. This density estimate (11.29 mussels per m^2) suggested a 43 percent decline in total mussel abundance between 1957 and 1977. Further comparison of the data from these two surveys (1957 and 1977) indicated that *Pleurobema cordatum* suffered a 97 percent decline, *Quadrula metanevra* declined 88 percent, while *Elliptio crassidens* increased 360 percent.

Data from surveys conducted in 1978 and 1983-1985 were reported in association with the number of minutes of dive time. The more random survey conducted in 1978 included 21 species and averaged 2.32 specimens per minute of dive time. In 1983-1985, 28 species were found and a mean of 4.78 mussels per minute of diving were recorded. Site selection differences are probably responsible for both the larger number of species and the greater density reported for the 1983-1985 survey.

Population Age Structure

During his 1957 study of P. cordatum in Chickamauga Reservoir, Scruggs (1960) measured the length of many specimens and counted external growth rests to estimate their age. He concluded that this population was dominated by the year classes of 1934 through 1936 and that over 95 percent were older than 12 years. No specimens less than 6 years old were found.

Although age data have not been taken on mussels from the vicinity of WBN since 1957, length data were collected during surveys in 1975-1977 and 1983-1985. In the most recent survey, age data were not taken because most specimens had been eroded so extensively that counts of growth rests could not be made. Mean length data from these surveys are compared to the 1957 data in table 7-18. For P. cordatum, mean length increased in both recent surveys, reaching 95.6 mm in 1983-1985 (table 7-19). This is 8.6 mm longer than the length Scruggs calculated for specimens in their 25th year of life--the oldest specimens in his analysis. Also, the 1983-1985 data indicated that sizes of P. cordatum are normally distributed around the mean, with no specimens shorter than the 60 mm and that the mean age is now well over 25 years. The sizes of most other species also appear to be normally distributed. No specimen smaller than the 30 mm was collected for any species. Scruggs (1960) concluded that impoundment had virtually eliminated successful recruitment of P. cordatum. Length data from the 1983-1985 survey support this conclusion and extend it to cover most other extant species as well.

Comparison of Monitoring Beds

Results from the three mussel beds sampled in detail during 1983-1985 were subjected to further analyses to identify similarities or differences among the specific beds because operational monitoring will be focused at these locations.

Similarities in community composition among the beds was evaluated by two different types of indices: Sorenson's Quotient of Similarity (SQS)--based solely on species presence or absence (McCain, 1975), and Percentage Similarity (PS)--incorporating information on species abundance (Pielou, 1975). Both indices yield values ranging from zero (no similarity) to 100 (identical communities), and a rule of thumb suggests 70 as a minimum score for recognizing similar communities. Since sampling effort was a constant for these data (all data had been collected during pairs of eleven-minute timed dives), SQS provided a numeric index of similarities in species composition while PS summarized relationships in terms of relative abundance. Formulas for these indices and calculated values for the three mussel beds are presented in table 7-20.

Results for summer and fall sampling in 1983-1985 are presented in appendix 7-1. SQS values for all three stations indicate the species composition is quite similar; however, the beds at TRM 520-521L and TRM 528-529L are more similar to each other than either is to the bed at TRM 526-527R. PS values retain the high similarity between the beds at TRM 520-521L and TRM 528-529L but highlight the low similarity in community composition between either of these beds and the bed at TRM 526-527R.

Analysis of variance (ANOVA) of relative abundance within each bed (examined separately) revealed some statistically significant differences among locations within the bed and among years. Differences by location (table 7-21) indicate that the distribution of a few species is not uniform on each bed. More than likely, these differences reflect either minor habitat variations along the length of each bed or random variations in the data collected. These differences do not appear to be substantial enough to affect comparisons among the full beds. Significant year-to-year differences within each bed were determined (table 7-21). Four of these suggested population declines during the three-year sampling period; the other two indicated population increases during this time. The apparent declines might have occurred through natural mortality or as a result of displacement related to sampling. Length data (table 7-19) argue against substantial recruitment to any of these populations. Given the apparent contradictions of these within-station differences, it appeared that random sampling variations accounted for these differences.

Results of ANOVA of abundance by species among the three beds indicated statistical differences for 11 of the 28 species (table 7-22). Duncan's Multiple Range Test indicated that the bed at TRM 526-527R yielded significantly higher counts for six species and a significantly lower count for one species. The bed at TRM 520-521L yielded two significantly higher counts and the bed at TRM 528-529L yielded one significantly higher count. Data on Ligumia recta indicated significant differences among the beds, with most specimens at TRM 528-529L and fewest at TRM 526-527R.

ANOVA of total abundance by species on all three beds by the year, 1983-1985 (table 7-23) resulted in significant differences for four species. One species, Pleurobema rubrum, was represented by only three specimens. The other three species (Anodonta grandis, Pleurobema cordatum and Quadrula metanevra), however, each were represented by more than 40 specimens and the statistical relationships likely reflect real population trends. These three species were most abundant in 1983 and two of them (P. cordatum and Q. metanevra) were least abundant in 1985. Two other well-represented species (Cyclonaias tuberculata and Plagiola lineolata) yielded similar declining trends between 1983 and 1985, but these trends were not statistically significant. Two other species (*Lampsilis ovata* and *Potamilus alatus*) yielded increasing trends, also without statistical differences. Data for the other 20 species indicated no apparent change in the number of individuals by year.

Mussel size (length) comparisons among the three beds for eight species represented by more than five measured specimens per bed are presented in table 7-24. Results of ANOVA tests of these data indicate that mean lengths of all eight species vary among the beds. Duncan's Multiple Range Test indicated that the bed at TRM 520-521L yielded significantly different (shorter) mean lengths for seven species, and the bed at TRM 526-527R had significantly different (longer) mean lengths for *Pleurobema cordatum* and *Potamilus alatus*. Length data for *Quadrula metanevra* indicate differences among the beds, with a longer mean length at TRM 526-527R and a shorter mean at 520-521L. All size data from the 1983-1985 sampling visits are presented in appendix 7-2.

ANOVA of mean length by year (1983-1985) indicate that the mean lengths of four species varied significantly (table 7-25). However, for most species some growth was indicated from 1983 to 1985.

Collectively, numerical indices and statistical analyses lead to the following comparisons of the three mussel beds. The species presence/absence similarity index (SQS) indicates these mussel aggregations exhibit a high degree of uniformity that might be expected from their proximity to each other. On the other hand, the abundance-weighted similarity index (PS), abundance of individual species, and much of the length analysis indicate substantial differences.

Working from downstream to upstream, the bed at TRM 520-521L seems to support the most species, including two species (Dromus dromas and Ptychobranchus fasciolaris) found only at this station and all but three species found on either of the other beds (Anodonta grandis, Lasmigona complanata, and Plethobasus cyphyus). This bed is quite similar to the one at TRM 528-529L according to both measures of similarity and, generally, in the abundance of most individual species. With regard to mean lengths, specimens of all eight abundant species at TRM 520-521L are consistently shorter than those on the other two beds (table 7-24).

The bed at TRM 526-527R shares the presence of 18 species with one or both of the other beds; however, abundance of the various species is substantially different (table 7-22). Six species (Amblema plicata, Anodonta grandis, Leptodea fragilis, Obliquaria reflexa, Potamilus alatus and Tritogonia verrucosa) are much more abundant on this bed than on either of the others. Two species (Pleurobema cordatum and Potamilus alatus) are consistently larger here.

The most upstream bed, TRM 528-529L, supports one species (Lasmigona complanata) not yet found on the other beds and lacks one species (Anodonta imbecillis) occurring at the other two (table 7-22). Lampsilis orbiculata is more abundant here than on the other beds but, generally, species abundance is similar to TRM 520-521L. Shell length for the abundant species is similar to TRM 526-527R and longer than TRM 520-521L except, as previously noted, for Pleurobema cordatum and Potamilus alatus which are longer at TRM 526-527R.

The abundance and length differences observed among mussel populations on these three beds probably are expressions of habitat differences among the three sites. Observations made by divers suggest the bed at TRM 526-527R includes more boulders and silt. This may explain why silt-dwelling species (i.e., Anodonta grandis, Leptodea fragilis and Potamilus alatus) are substantially more abundant here. No observations or hypotheses have been advanced to explain the short shell lengths at TRM 520-521L or other differences between the beds.

7.2.3 Summary and Conclusions

The extant freshwater mussel fauna in the WBN reach of the Tennessee River consists of approximately 30 species, far fewer than the 64 species which existed prior to impoundment. Data from five surveys conducted bewteen 1956 and 1985 indicate that relative abundance of the species has not remained constant; however, the same five species have consistently accounted for approximately 90 percent of the community. In typical order of abundance, these species are: Elliptio crassidens, Pleurobema cordatum, Quadrula pustulosa, Cyclonaias tublerculata and Plagiola lineolata. In recent years many of the remaining species have been represented by less than one percent of the specimens examined.

Total relative abundance of this mussel community declined from 20.0 to 11.3 animals per m^2 between 1957 and 1977; however, this apparent decline may have resulted from differences in the sampling programs that were used. More recent quantitative data have been collected on the basis of mussels observed per minute of dive time, which has not been correlated with areal abundance information.

Age data have not been collected in recent surveys because most shells are extensively eroded. Shell length data from the 1957, 1975-1977 and 1983-1985 surveys indicate that mean lengths are increasing for many species. Incremental separation of the 1983-1985 length data indicates that no specimens shorter than 30 mm were found, suggesting that very little recruitment has occurred. Data on the age/length relationship for Pleurobema cordatum suggests that this population is quite old and may not have reproduced successfully in the past 40 years--since before the adjacent dams were closed. Length distributions for most of the other species indicates that they also may not have reproduced successfully since the dams were closed.

The three mussel beds studied in detail during 1983-1985, and proposed to be used for operational monitoring of WBN, are similar to each other in terms of species composition but other parameters differ. Statistical differences among these beds include the greater abundance of several species in the bed at TRM 526-527R and the smaller size of specimens in the bed at TRM 520-521L.

During the next several years, relative abundance on each bed should not change significantly, even though some rare species could disappear from the communities. Actual abundance can be expected to decline slowly as older specimens die but growth (shell length) for many species should continue gradually. All of these changes should occur slowly, without abrupt changes. Substantial deviations from these expected trends would indicate critical changes in the river habitat or water quality.

Table 7-1. Summary of Macroinvertebrate Samples Collected During Preoperational Monitoring at Watts Bar Nuclear Plant, Spring 1973 through Autumn 1985.

			Tennessee River Mile*								
Season	Sample Type	Year	496.5	506.6	518.0	521.0	526.3	527.4	528.0	528.5	529.5
Winter	30-day unbagged substrates	1975	2	2	1	-†	-	1	1	-	-
		1976	0	0	0	-	-	0	0	-	-
		1977	0	3	3	-	-	1	2	-	2
		1983	3	0	3	-	-	1	3	-	1
		1984	3	3	3	-	-	3	3	-	3
		1985	3	3	3	-	-	3	3	-	3
	30-day bagged substrates	1983	3	0	3	-	-	2	0	-	2
		1984	3	3	3	-	-	3	3	-	3
		1985	3	3	3	-	-	3	3	-	3
	90-unbagged substrates	1975	3	3	1	-	-	3	2	-	-
		1984	3	3	3	-	-	3	3	-	3
		1985	3	3	3	-	-	0	2	-	1
Spring	30-day unbagged substrates	1975	2	0	3	-	-	2	1	-	-
		1976	3	3	3	-	-	3	3	-	-
		1977	0	1	3	-	-	3	0	-	0
		1982	0	3	3	-	-	0	3	-	2
		1983	0	2	3	-	-	0	0	-	0
		1984	0	0	0	-	-	0	0	-	0
		1985	3	3	3	-	-	3	3	-	3
	30-day bagged substrates	1983	0	0	0	-	-	0	0	-	0
		1984	0	0	0	-	-	0	0	-	0
		1985	3	3	3	-	-	3	3	-	3
	90-day unbagged substrates	1973	1	0	2	-	-	1	1	-	-
		1974	1	1	1	-	-	1	0	-	-
		1984	0	0	3	-	-	3	3	-	0
		1985	3	3	3	-	-	3	3	-	3

Table 7-1 (continued)

Season	Sample Type	Year	Tennessee River Mile* 496.5	506.6	518.0	521.0	526.3	527.4	528.0	528.5	529.5
Summer	30-day unbagged substrates	1975	0	3	3	-	-	3	3	-	-
		1976	3	1	3	-	-	1	2	-	-
		1977	3	3	3	-	-	3	3	-	0
		1982	3	2	3	-	-	3	2	-	3
		1983	3	3	3	-	-	3	0	-	3
		1984	3	3	3	-	-	3	3	-	2
		1985	3	3	3	-	-	3	3	-	0
	30-day bagged substrates	1983	3	3	3	-	-	3	0	-	3
		1984	3	3	3	-	-	3	3	-	3
		1985	3	3	3	-	-	3	3	-	0
	90-day unbagged substrates	1973	0	1	0	-	-	0	0	-	-
		1974	0	3	3	-	-	3	3	-	-
		1984	3	3	3	-	-	3	3	-	0
		1985	3	3	3	-	-	3	3	-	3
	Hess Sampler	1983	-	-	-	10	10	10	10	10‡	-
		1984	-	-	-	10	10	10	10	10	-
		1985	-	-	-	10	10	10	10	10	-
Autumn	30-day unbagged substrates	1975	3	0	3	-	-	3	0	-	-
		1976	0	3	3	-	-	2	0	-	0
		1977	2	3	3	-	-	1	1	-	0
		1982	2	0	0	-	-	0	1	-	3
		1983	3	3	3	-	-	3	3	-	3
		1984	3	3	3	-	-	3	3	-	3
		1985	3	3	3	-	-	3	3	-	3
	30-day bagged substrates	1983	3	3	3	-	-	3	3	-	3
		1984	3	3	3	-	-	3	3	-	3
		1985	3	3	3	-	-	3	3	-	3

Table 7-1 (continued)

Season	Sample Type	Year	496.5	506.6	518.0	521.0	526.3	527.4	528.0	528.5	529.5
			Tennessee River Mile*								
	90-day unbagged substrates	1973	1	1	1	-	-	2	1	-	-
		1974	3	0	1	-	-	0	3	-	-
		1983	3	3	3	-	-	3	0	-	3
		1984	3	3	2	-	-	1	3	-	3
		1985	0	3	3	-	-	2	3	-	0
	Hess Sampler	1983	-	-	-	10	10	10	10	10	-
		1984	-	-	-	10	10	10	10	10	-
		1985	-	-	-	10	10	10	10	10	-

Summary

30-day unbagged substrates		30-day bagged substrates	
Samples required in workplan	465	Samples required in workplan	216
Samples collected	316	Samples collected	166
Percent recovery	68.0	Percent recovery	76.9
90-day unbagged substrates		Hess Sampler	
Samples required	267	Samples required in workplan	300
Samples collected	178	Samples collected	300
Percent recovery	66.7	Percent recovery	100

*Samples were initially collected from TRM 529.9 (spring 1973 through summer 1976); however, because of the poor recovery rate (only 10 substrates) and dissimilarity of the habitat from other stations, this station is not included as part of the preoperational program. TRM 529.5 replaced TRM 529.9 beginning autumn 1976.

†No samples required by workplan.

‡Collected at TRM 528.8.

Table 7-2. Average Abundance of Total Macroinvertebrates Collected by Various Sampling Techniques near Watts Bar Nuclear Plant, Spring 1973 through Autumn 1985.

Season	Location	Sampling Technique							
		30-Day Unbagged		90-Day Unbagged		30-Day Bagged		Hess Sampler	
	(TRM)	($\bar{x}$)	($S\bar{x}$)	($\bar{x}$)	($S\bar{x}$)	($\bar{x}$)	($S\bar{x}$)	($\bar{x}$)	($S\bar{x}$)
Winter	496.5	26.8	6.3	42.3	7.4	56.7	12.5	-*	-
	506.6	25.0	8.4	5.4	5.4	51.2	25.1	-	-
	518.0	3.2	0.6	8.0	1.0	4.9	1.3	-	-
	527.4	5.3	2.2	9.8	3.0	7.0	2.8	-	-
	528.0	7.1	2.0	7.3	2.4	18.2	5.3	-	-
	529.5	3.7	1.4	9.5	1.2	6.1	2.0	-	-
Spring	496.5	16.4	3.9	21.8	7.4	29.0	5.9	-	-
	506.6	21.3	5.5	11.8	4.1	22.3	4.9	-	-
	518.0	35.6	7.7	10.0	2.8	33.7	4.3	-	-
	527.4	42.7	6.3	31.8	6.3	76.3	25.5	-	-
	528.0	30.4	5.3	24.0	6.4	114.3	8.7	-	-
	529.5	61.8	19.2	41.3	8.6	50.7	10.5	-	-
Summer	496.5	35.3	10.2	22.8	5.4	46.3	12.5	-	-
	506.6	21.4	4.7	47.0	13.2	32.4	9.6	-	-
	518.0	66.0	21.9	56.6	14.2	190.6	68.2	-	-
	521.0	-	-	-	-	-	-	853.6	42.5
	526.3	-	-	-	-	-	-	1283.2	105.5
	527.4	114.2	39.6	131.8	41.3	296.1	88.7	791.6	67.1
	528.0	79.4	23.4	154.0	57.8	362.3	113.9	770.4	48.0
	528.5†	-	-	-	-	-	-	1008.4	73.5
	529.5	138.1	49.6	76.0	5.6	260.5	79.0	-	-
Autumn	496.5	19.7	1.7	14.5	2.0	43.8	9.2	-	-
	506.6	16.7	3.2	28.0	7.0	24.6	4.9	-	-
	518.0	7.6	2.6	115.8	39.1	13.4	4.2	-	-
	521.0	-	-	-	-	-	-	883.2	37.2
	526.3	-	-	-	-	-	-	965.6	51.2
	527.4	11.6	3.0	189.4	30.5	19.6	2.6	1064.0	64.7
	528.0	15.6	3.9	135.7	38.5	14.1	3.2	1212.0	91.9
	528.5	-	-	-	-	-	-	1148.4	86.3
	529.5	7.8	2.6	448.7	56.6	11.6	2.6	-	-

*No sample collected.
†Includes data from TRM 528.8, collected summer 1983.

Table 7-3. Average Abundance of Predominant* Macroinvertebrates Collected from Artificial Substrates Following One-Month Colonization Periods near Watts Bar Nuclear Plant, Winter 1975 through Autumn 1985 (Unbagged Collection).

		Tennessee River Mile					
Season	Organism	496.5	506.6	518.0	527.4	528.0	529.5
Winter	Chironomidae	3.5	1.4	0.2	1.2	1.7	1.2
	Hyalella azteca	3.1	7.0	0.2	0.0	0.0	0.0
	Planariidae	3.7	0.2	0.6	1.7	0.8	1.3
	Stenacron	0.2	0.0	0.2	0.3	2.6	0.0
	Total	26.8	25.0	3.2	5.3	7.1	3.7
Spring	*Cyrnellus fraternus*	0.1	0.4	1.8	1.8	8.7	1.3
	Hydra americana	5.3	1.1	8.7	0.5	0.0	0.0
	Oligochaeta	3.4	1.5	0.0	0.1	0.0	1.5
	Parachironomus	1.3	0.9	3.6	8.5	3.1	31.3
	Planariidae	1.6	0.2	0.8	4.4	6.2	12.0
	Sida crystallina	0.0	4.0	10.6	7.6	1.4	0.0
	Total	16.4	21.3	35.6	42.7	30.4	61.8
Summer	*Cyrnellus fraternus*	14.3	8.1	15.7	83.8	37.8	68.6
	Oligochaeta	7.1	1.7	2.9	0.7	0.0	0.3
	Total	35.3	21.4	66.0	114.2	79.4	138.1
Autumn	*Cheumatopsyche*	0.1	0.1	0.6	0.7	0.8	3.6
	Oligochaeta	5.7	2.7	3.2	0.3	0.2	0.1
	Planariidae	5.3	2.9	0.2	0.9	4.0	0.7
	Stenacron	0.5	0.2	1.0	4.3	5.0	0.3
	Total	19.7	16.7	7.6	11.6	15.6	7.8

*Taxa comprising ≥20 percent of the total at any location.

Table 7-4. Average Abundance of Predominant* Macroinvertebrates Collected from Artificial Substrates Following One-Month Colonization Periods near Watts Bar Nuclear Plant, Winter 1983 through Autumn 1985 (Bagged Collection).

		Tennessee River Mile					
Season	Organism	496.5	506.6	518.0	527.4	528.0	529.5
Winter	Chironomidae	13.2	2.7	0.9	2.4	5.2	4.1
	Hyalella azteca	10.4	31.0	0.9	0.1	0.0	0.0
	Planariidae	6.4	0.7	0.3	1.4	3.2	0.6
	Stenacron	0.1	0.5	0.7	1.1	7.0	0.3
	Total	56.7	51.2	4.9	7.0	18.2	6.1
Spring	*Crangonyx*	0.0	0.0	7.3	48.0	54.0	0.0
	Hexagenia	7.0	1.0	0.0	0.0	0.0	0.0
	Hyaella azteca	0.0	7.0	0.3	0.0	0.0	0.0
	Oligochaeta	6.0	2.7	0.0	0.0	1.0	0.0
	Parachironomus	0.0	0.3	0.0	1.3	0.7	31.0
	Planariidae	5.0	0.3	6.0	6.3	8.0	6.7
	Total	29.0	22.3	33.7	76.3	114.3	50.7
Summer	*Cheumatopsyche*	0.1	0.2	10.2	10.2	30.5	64.5
	Chironomidae	0.6	0.3	23.8	15.8	44.7	46.8
	Cyrnellus fraternus	19.2	10.8	29.1	197.8	162.5	85.2
	Dugesia tigrina	1.3	4.4	54.4	17.3	37.8	18.2
	Total	46.3	32.4	190.6	296.1	362.3	260.5
Autumn	*Cheumatopsyche*	0.1	0.0	0.8	2.0	2.7	5.6
	Dugesia tigrina	2.9	0.0	3.9	1.4	1.9	1.1
	Oligochaeta	8.8	3.1	0.0	0.0	0.1	0.0
	Planariidae	17.0	1.7	0.3	2.0	2.1	0.6
	Stenacron	0.9	0.8	2.9	5.4	3.0	0.2
	Total	43.8	24.6	13.4	19.6	14.1	11.6

*Taxa comprising $\geq$20 percent of the total at any location.

Table 7-5. Average Abundance of Predominant* Macroinvertebrates Collected from Artificial Substrates Following Three-Month Colonization Periods near Watts Bar Nuclear Plant, Spring 1973 through Autumn 1985 (Unbagged Collection).

		Tennessee River Mile					
Season	Organism	496.5	506.6	518.0	527.4	528.0	529.5
Winter	*Cheumatopsyche*	0.0	1.4	1.4	1.3	1.4	4.3
	Chironomidae	1.2	1.4	1.7	0.2	0.3	1.5
	Cyrnellus fraternus	0.2	0.9	0.1	2.2	0.1	1.0
	Dugesia tigrina	8.6	0.1	0.6	0.0	0.0	0.8
	Parachironomus	0.4	1.7	0.0	3.3	2.7	0.0
	Planariidae	13.0	1.8	0.6	0.0	0.1	0.3
	Stenacron	0.2	0.2	1.6	1.5	1.1	0.0
	Total	42.3	19.8	8.0	9.8	7.3	9.5
Spring	Chironomidae	1.2	0.0	2.7	8.8	7.6	0.7
	Coelotanypus	0.2	2.5	0.1	0.0	0.0	0.0
	Oligochaeta	5.6	3.0	0.0	0.4	0.0	0.0
	Planariidae	0.4	0.0	2.3	16.9	13.7	35.7
	Total	21.8	11.8	10.0	31.8	24.0	41.3
Summer	*Cyrnellus fraternus*	5.2	13.3	11.4	64.8	69.3	5.7
	Dicrotendipes	0.2	0.0	7.1	10.9	8.0	38.3
	Oligochaeta	5.7	2.3	0.0	0.2	0.0	0.0
	Stenacron	2.3	7.4	12.6	6.0	22.2	0.7
	Total	22.8	47.0	56.6	131.8	154.0	76.0
Autumn	*Cheumatopsyche*	0.2	5.9	42.7	42.9	5.1	115.2
	Cyrnellus fraternus	2.4	6.5	31.1	83.1	68.3	170.3
	Hydropsyche	0.0	0.0	0.3	0.3	0.6	118.7
	Oligochaeta	3.0	1.7	0.0	0.0	0.0	0.0
	Stenacron	0.5	5.5	24.7	48.9	39.0	4.7
	Total	14.5	28.0	115.8	189.4	135.7	448.7

*Taxa comprising $\geq$20 percent of the total at any location.

Table 7-6. Average Abundance of Predominant* Macroinvertebrates (No./m^2) Collected near Watts Bar Nuclear Plant, Summer and Autumn 1983 through 1985 (Hess Sampler Collection).

Season	Organism	Tennessee River Mile 521.0	526.3	527.4	528.0	528.5†
Summer	*Chironomus*	5.2	180.0	5.6	0.0	1.2
	Corbicula manilensis	681.6	901.2	616.0	552.4	796.8
	Cyrnellus fraternus	12.4	14.4	31.6	53.2	55.2
	Oligochaeta‡	45.6	114.0	65.2	47.6	61.2
	Total	853.6	1283.2	791.6	770.4	1008.4
Autumn	*Corbicula manilensis*	640.4	704.4	676.0	509.6	511.6
	Crangonyx	13.6	3.2	13.6	79.6	38.0
	Cyrnellus fraternus	59.6	106.0	219.2	426.0	415.6
	Oligochaeta	43.6	88.8	61.2	9.2	31.2
	Total	883.2	965.6	1064.0	1212.0	1148.4

*Taxa comprising $\geq$5 percent of the total at any location.
†Includes data from TRM 528.8, collected summer 1985.
‡Includes *Branchiura sowerbyi* and Tubificidae

Table 7-7. Sampling Variability (Coefficient of Variation) for Total Macroinvertebrates Collected by Various Sampling Techniques near Watts Bar Nuclear Plant, Spring 1973 through Autumn 1985.

		Tennessee River Mile								
Season	Sample Type	496.5	506.6	518.0	521.0	526.3	527.4	528.0	528.5	529.5
Winter	30-day unbagged	78	100	71	-*	-	124	96	-	111
	90-day unbagged	52	81	35	-	-	76	86	-	25
	30-day bagged	66	120	78	-	-	114	72	-	92
Spring	30-day unbagged	67	90	92	-	-	49	55	-	62
	90-day unbagged	76	70	84	-	-	56	70	-	36
	30-day bagged	35	38	22	-	-	58	13	-	36
Summer	30-day unbagged	123	93	152	-	-	151	118	-	102
	90-day unbagged	58	89	76	-	-	94	113	-	13
	30-day bagged	81	89	107	-	-	90	77	-	74
	Hess Sampler	-	-	-	28	45	46	34	40†	-
Autumn	30-day unbagged	34	74	147	-	-	100	82	-	116
	90-day unbagged	51	79	107	-	-	96	90	-	31
	30-day bagged	63	60	94	-	-	40	67	-	68
	Hess Sampler	-	-	-	23	29	33	42	41	-

*Sample not required by workplan.

†Includes data from TRM 528.8, collected summer 1983.

Table 7-8. Benthic Macroinvertebrate Taxa Collected During Preoperational Monitoring at Watts Bar Nuclear Plant, Spring 1973 through Autumn 1985.

	Sample Type			
Taxon	30-day (unbagged)	30-day (bagged)	90-day (unbagged)	Hess
Ablabesmyia	X	X	X	X
Agraylea		X		
Amblema plicata				X
Amnicola	X	X	X	X
Amphinemura	X			
Anculosa	X			
Anodonta imbecillis				X
Argia	X	X	X	
Asellus		X	X	X
Bivalvia		X	X	
Bryozoa	X		X	
Caenis	X	X	X	X
Cambarus	X	X	X	
Campeloma	X	X	X	X
Ceraclea	X	X		X
Ceratopogonidae	X			
Chaoborus	X	X	X	X
Cheumatopsyche	X	X	X	X
Chironomidae	X	X	X	X
Chironomus	X	X	X	X
Chironomus tentan	X			
Clinotanypus	X	X	X	
Coelotanypus	X	X	X	X
Coenagrionidae				X
Conchapelopia				X
Corbicula manilensis	X	X	X	X
Crangonyx	X	X	X	X
Cricotopus	X			
Cryptochironomus	X	X	X	X
Cura foremanii	X	X	X	
Cyclonaias tuberculata				X
Cyrnellus fraternus	X	X	X	X
Decapoda	X	X	X	
Dicrotendipes	X	X	X	X
Didymops			X	
Diptera		X		
Dromogomphus		X	X	X
Dugesia tigrina	X	X	X	X
Elliptio crassidens				X
Elmidae		X		
Enallagma	X	X	X	X
Epitheca	X		X	
Epicocladius	X	X		
Erpobdellidae	X		X	X

Table 7-8 (Continued)

Taxon	Sample Type 30-day (unbagged)	 30-day (bagged)	 90-day (unbagged)	 Hess
Eurylophella		X		
Ferrissia	X	X	X	
Fusconaia ebena				X
Gammarus	X	X	X	X
Glossiphoniidae	X		X	X
Glyptotendipes	X	X	X	X
Gnathobdellida	X			
Gomphidae		X		
Gomphus	X	X	X	X
Gyraulus	X	X	X	X
Hexagenia	X	X	X	X
Hirudinea	X	X	X	X
Hyalella azteca	X	X	X	
Hydra americana	X	X	X	
Hydrachnidae				X
Hydropsyche	X	X	X	X
Hydroptila	X	X	X	
Ischnura	X	X	X	X
Leptoceridae	X			
Leptodea	X			
Libellulidae	X	X		
Lirceus	X	X	X	X
Macronychus				X
Naididae	X	X	X	X
Nemata	X	X	X	
Nemoura	X			
Neureclipsis	X	X		
Neurocordulia	X	X	X	
Neurocordulia yamaskanensis			X	
Obliquaria reflexa				X
Odonata			X	
Oecetis	X	X	X	
Oligochaeta*	X	X	X	X
Orconectes	X	X	X	X
Orthocladius	X			
Orthotrichia		X		
Parachironomus	X	X	X	X
Parasitengona	X			
Paratendipes	X	X		
Pectinatella magnifica			X	
Physa	X	X	X	X
Plagiola lineolata				X
Planariidae	X	X	X	X
Pleurobema cordatum				X
Pleurobema cordatum pyramidatum				X
Pleurocera	X	X	X	X
Polycentropus	X		X	

Table 7-8 (Continued)

Taxon	Sample Type 30-day (unbagged)	30-day (bagged)	90-day (unbagged)	Hess
Polypedilum	X			
Procladius	X	X	X	X
Proptera alata			X	
Pseudochironomus	X	X		
Quadrula pustalosa				X
Rheotanytarsus	X			
Sialis	X	X	X	X
Sida crystallina	X			
Sphaerium	X	X	X	X
Stenacron	X	X	X	X
Stenochironomus			X	
Taeniopteryx	X			
Tanypus	X		X	
Triaenocles	X			
Trichoptera			X	
Tricorythodes			X	X
Viviparus		X		
Xenochironomus	X		X	

*Includes *Branchiura sowerbyi*, *Limnodrillus*, and Tubificidae

Table 7-9. Macroinvertebrate Taxa Collected Exclusively Upstream or Downstream of Watts Bar Nuclear Power Plant, During Preoperational Monitoring, Spring 1973 through Autumn 1985 (All Collection Techniques)

Taxon	Downstream	Upstream*
Agraylea sp.	X	
Amblema sp.	X	
Amphinemura sp.	X	
Anculosa sp.	X	
Anodonta imbecillis	X	
Branchiura sp.	X	
Chironomus (chironomus) tentans	X	
Clinotanypus sp.	X	
Coenagrionidae		X
Conchapelopia sp.	X	
Cryptochironomus sp.	X	
Cura sp.	X	
Cyclonaias tuberculata	X	
Didymops sp.	X	
Diptera	X	
Dromogomphus sp.	X	
Dugesia sp.	X	
Elmidae	X	
Epitheca sp.	X	
Eurylophella	X	
Fusconaia ebena	X	
Gnathobdellida	X	
Gomphidae	X	
Gomphus sp.	X	
Hydrachnidae	X	
Ischnura sp.	X	
Leptoceridae	X	
Leptodea sp.	X	
Limnodrilus sp.	X	
Macronychus sp.	X	
Nemata	X	
Nemoura sp.	X	
Neurocordulia sp.	X	
Neurocordulia yamaskanensis		X
Obliquaria reflexa	X	
Odonata	X	
Orthotrichia sp.	X	
Parasitengona	X	
Paratendipes sp.	X	
Pectinatella magnifica	X	
Plagiola lineolata	X	
Pleurobema cordatum	X	
Pleurobema cordatum pyramidatum	X	
Polycentropus sp.	X	
Proptera alata	X	
Quadrula sp.	X	

Table 7-9 (Continued)

Taxon	Downstream	Upstream*
Rheotanytarsus sp.		X
Sialis sp.	X	
Stenochironomus sp.	X	
Stictochironomus sp.	X	
Taeniopteryx sp.	X	
Triaenodes sp.	X	
Trichoptera	X	
Viviparus sp.	X	

*Upstream: River Miles 529.5, 528.8, 528.5 and 528.0
Downstream: River Miles 527.4, 526.3, 521.0, 518.0, 506.6 and 496.5

Table 7-10. Results of Principal Component Analysis Including Average Abundance of Important* Organisms Collected from Artificial Benthic Substrates After 30 Days Exposure in the Vicinity of Watts Bar Nuclear Plant, 1975-77 and 1982-85.

Season	Principal Component	Cumulative R^2	Eigenvector	Organism	Tennessee River Mile 496.5	506.6	518.0	527.4	528.0	529.5
Winter				n =	11	9	13	9	12	9
	1	.73	+.49	Oligochaeta	4.5	4.1	0.0	0.2	0.0	0.1
			+.52	*Hyalella azteca*	3.1	7.0	0.2	0.0	0.0	0.0
			+.32	*Hexagenia*	3.1	1.0	0.0	0.0	0.0	0.0
			+.42	*Coelotanypus*	2.4	3.6	0.0	0.0	0.0	0.0
	2	.88	+.58	Planariidae	3.7	0.2	0.6	1.7	0.6	1.3
			-.33	*Cheumatopsyche*	0.0	1.2	0.1	0.4	1.1	0.1
	3	.96	+.77	*Stenacron*	0.2	0.0	0.2	0.3	2.6	0.0
			+.40	Chironomidae	3.5	1.4	0.2	1.2	1.7	1.2
			+.41	*Cheumatopsyche*	0.0	1.2	0.1	0.4	1.1	0.1
Spring				n =	8	12	18	11	10	4
	1	.39	+.48	Planariidae	1.6	0.2	0.8	4.4	6.2	12.0
			-.40	*Hydra americana*	5.3	1.1	8.7	0.5	0.0	0.0
			+.49	*Parachironomus*	1.3	0.9	3.6	8.5	3.1	31.3
	2	.67	-.35	Oligochaeta	3.4	1.5	0.0	0.1	0.0	1.5
			+.36	*Chironomus*	0.0	0.3	0.2	4.8	0.5	0.0
			+.39	*Crangonyx*	0.0	0.0	0.2	4.3	2.2	0.0
			+.56	*Sida crystallina*	0.0	4.0	10.6	7.6	1.4	0.0
	3	.80	+.48	Chironomidae	0.3	1.6	3.4	1.2	1.5	9.0
			-.31	*Crangonyx*	0.0	0.0	0.2	4.3	2.2	0.0
			+.38	*Oecetis*	0.1	0.1	0.0	0.0	0.0	0.0
			+.38	Parachironomus	1.3	0.9	3.6	8.5	3.1	31.3
			+.33	*Sida crystallina*	0.0	4.0	10.6	7.6	1.4	0.0

Table 7-10 (Continued)

Season	Principal Component	Cumulative R^2	Eigenvector	Organism	Tennessee River Mile					
					496.5	506.6	518.0	527.4	528.0	529.5
Summer				n =	18	18	21	19	16	8
	1	.68	+.42	Chironomidae	0.1	0.1	6.0	4.9	5.5	9.0
			+.30	*Cyrnellus fraternus*	14.3	8.1	15.7	83.8	37.8	68.6
			+.50	*Cheumatopsyche*	0.1	0.1	6.7	4.7	1.6	26.8
			+.51	*Hydropsyche*	0.0	0.1	8.0	7.4	4.9	16.9
	2	.81	+.46	*Dicrotendipes*	0.8	2.1	1.5	0.1	3.6	1.9
			-.43	*Cyrnellus fraternus*	14.3	8.1	15.7	83.8	37.8	68.6
			+.38	*Parachironomus*	0.3	0.1	2.0	0.3	4.1	2.3
			+.55	*Dugesia tigrina*	0.7	2.9	10.9	1.9	9.7	7.6
	3	.89	+.48	Planariidae	4.2	0.2	1.4	0.0	0.8	0.0
			+.58	Oligochaeta	7.1	1.7	2.9	0.7	0.2	0.3
			+.36	*Cheumatopsyche*	0.1	0.1	6.7	4.7	1.6	26.8
Fall				n =	16	15	18	15	11	12
	1	.52	+.55	Oligochaeta	5.7	2.7	3.2	0.3	0.2	0.1
			+.35	*Hexagenia*	1.4	1.5	0.0	0.0	0.0	0.0
			-.37	*Stenacron*	0.5	0.2	1.0	4.3	5.0	0.3
			+.34	*Coelotanypus*	1.1	1.8	0.0	0.0	0.1	0.0
	2	.74	+.61	*Hydra*	0.0	0.0	0.1	0.2	0.3	0.3
			+.59	*Stenacron*	0.5	0.2	1.0	4.3	5.0	0.3
	3	.88	+.30	Planariidae	5.3	2.9	0.2	0.9	4.0	0.7
			-.37	*Stenacron*	0.5	0.2	1.0	4.3	5.0	0.3
			-.44	*Chironomus*	0.4	0.1	0.9	1.1	0.0	0.0
			+.37	*Cheumatopsyche*	0.1	0.1	0.6	0.7	0.8	3.6
			-.46	Oligochaeta	5.7	2.7	3.2	0.3	0.2	0.1

Table 7-10 (Continued)

	Principal	Cumulative			Tennessee River Mile					
Season	Component	R^2	Eigenvector	Organism	496.5	506.6	518.0	527.4	528.0	529.5
Combined				n =	53	54	70	54	49	33
	1	.61	−.37	Oligochaeta	5.6	2.3	1.7	0.4	0.1	0.3
			+.40	<u>Cyrnellus fraternus</u>	5.0	2.9	5.3	30.2	14.4	17.0
			+.39	<u>Cheumatopsyche</u>	0.1	0.3	2.5	2.4	1.0	7.8
			+.31	<u>Parachironomus</u>	0.3	0.2	1.5	1.8	2.0	4.3
			+.38	<u>Hydropsyche</u>	0.0	0.2	2.4	2.6	1.8	4.1
	2	.76	+.38	<u>Hydra americana</u>	0.8	0.3	2.3	0.2	0.1	0.1
			−.36	Planariidae	4.0	0.9	0.8	1.4	2.6	2.1
			+.36	<u>Stenacron</u>	0.9	1.1	3.4	3.7	3.8	0.7
			+.61	<u>Sida cryustallina</u>	0.0	0.9	2.7	1.6	0.3	0.0
	3	.87	+.38	<u>Stenacron</u>	0.9	1.1	3.4	3.7	3.8	0.7
			+.46	<u>Cyrnellus fraternus</u>	5.0	2.9	5.3	30.2	14.4	17.0
			−.45	<u>Cheumatopsyche</u>	0.1	0.3	2.5	2.4	1.0	7.8

*Eigenvector ≥ 0.300

Table 7-11. Similarity of Benthic Macroinvertebrate Community Composition During Preoperational Monitoring (1983-1985) Based on Sorensen's Quotient of Similarity, Watts Bar Nuclear Plant, Chickamauga Reservoir, Hess Samples.

Year	Quarter	Station	NT*	Station Comparison	CS†	NC‡	Sorensen's Quotient of Similarity (%)	Percentage Similarity
1983	Summer	528.8	14	TRM 528.8-528.0	17	9	69.23	83.78
		528.0	12	TRM 528.8-527.4	17	11	78.57	62.11
		527.4	14	TRM 528.8-526.3	15	7	63.64	80.00
		526.3	8	TRM 528.8-521.0	16	10	76.92	82.92
		521.0	12	TRM 528.0-527.4	15	11	84.62	70.79
				TRM 528.0-526.3	14	6	60.00	81.77
				TRM 528.0-521.0	16	8	66.67	83.91
				TRM 527.4-526.3	16	6	54.55	58.38
				TRM 527.4-521.0	16	10	76.92	62.81
				TRM 526.3-521.0	13	7	70.00	95.22
	Autumn	528.5	11	TRM 528.5-528.0	14	6	60.00	89.99
		528.0	9	TRM 528.5-527.4	16	7	60.87	80.79
		527.4	12	TRM 528.5-526.3	17	7	58.33	76.05
		526.3	13	TRM 528.5-521.0	15	6	57.14	74.80
		521.0	10	TRM 528.0-527.4	15	6	57.14	84.54
				TRM 528.0-526.3	16	6	54.55	79.86
				TRM 528.0-521.0	12	7	73.68	78.71
				TRM 527.4-526.3	17	8	64.00	94.58
				TRM 527.4-521.0	16	6	54.55	92.51
				TRM 526.3-521.0	17	6	52.17	93.39
1984	Summer	528.5	17	TRM 528.5-528.0	22	13	74.29	68.74
		528.0	18	TRM 528.5-527.4	21	11	68.75	95.36
		527.4	15	TRM 528.5-526.3	25	12	64.86	94.70
		526.3	20	TRM 528.5-521.0	24	12	66.67	72.85
		521.0	19	TRM 528.0-527.4	22	11	66.67	65.84
				TRM 528.0-526.3	27	11	57.89	63.07
				TRM 528.0-521.0	26	11	59.46	80.98
				TRM 527.4-526.3	25	10	57.14	94.42
				TRM 527.4-521.0	22	13	70.59	73.48
				TRM 526.3-521.0	26	12	66.67	73.81
	Autumn	528.5	17	TRM 528.5-528.0	24	14	73.68	86.90
		528.0	20	TRM 528.5-527.4	24	11	62.86	72.50
		527.4	17	TRM 528.5-526.3	22	10	62.50	61.03
		526.3	14	TRM 528.5-521.0	21	13	76.47	64.35
		521.0	16	TRM 528.0-527.4	25	12	64.86	62.40
				TRM 528.0-526.3	22	12	70.59	50.58
				TRM 528.0-521.0	24	12	66.67	51.97
				TRM 527.4-526.3	22	9	58.06	84.78
				TRM 527.4-521.0	23	10	60.61	66.77
				TRM 526.3-521.0	19	11	73.33	74.07

Table 7-11 (Continued)

Year	Quarter	Station	NT*	Station Comparison	CS†	NC‡	Sorensen's Quotient of Similarity (%)	Percentage Similarity
1985	Summer	528.5	12	TRM 528.5-528.0	21	9	60.00	89.72
		528.0	18	TRM 528.5-527.4	16	9	72.00	81.69
		527.4	13	TRM 528.5-526.3	24	7	45.16	50.72
		526.3	19	TRM 528.5-521.0	26	10	55.56	71.20
		521.0	24	TRM 528.0-527.4	21	10	64.52	80.62
				TRM 528.0-526.3	29	8	43.24	47.87
				TRM 528.0-521.0	31	11	52.38	70.27
				TRM 527.4-526.3	21	11	68.75	46.88
				TRM 527.4-521.0	26	11	59.46	73.90
				TRM 526.3-521.0	27	16	74.42	57.06
	Autumn	528.5	14	TRM 528.5-528.0	19	8	59.26	75.23
		528.0	13	TRM 528.5-527.4	15	13	92.86	72.65
		527.4	14	TRM 528.5-526.3	19	11	73.33	63.76
		526.3	16	TRM 528.5-521.0	21	11	68.75	59.91
		521.0	18	TRM 528.0-527.4	22	10	59.26	68.69
				TRM 528.0-526.3	21	8	55.17	60.49
				TRM 528.0-521.0	24	7	45.16	58.64
				TRM 527.4-526.3	19	11	73.33	78.16
				TRM 527.4-521.0	20	12	75.00	68.72
				TRM 526.3-521.0	22	12	70.59	78.96

*Number of taxa found at each station.
†Total number of taxa found at stations being compared.
‡Number of taxa in common between stations being compared.

Table 7-12. Results of One-Way Analysis of Variance and Duncan's New Multiple Range Test on Total Benthic Macroinvertebrate Standing Crop (number/m²) for Preoperational Monitoring, Watts Bar Nuclear Plant, Chickamauga Reservoir, Hess Samples.

				Tennessee River Mile				
Year	Quarter	F-Ratio	P>F	Low $\bar{x}$				High $\bar{x}$
1983	Summer	7.07	0.0002	527.4	521.0	526.3	528.0	528.8
	Autumn	1.31	0.2818	N.S.D.*				
1984	Summer	5.45	0.0011	528.0	521.0	528.5	526.3	527.4
	Autumn	11.21	0.0001	521.0	526.3	527.4	528.5	528.0
1985	Summer	27.15	0.0001	527.4	528.5	528.0	521.0	526.3
	Autumn	0.75	0.5663	N.S.D.				

*No significant difference.

Table 7-13. Total Abundance of Macroinvertebrates (No./m²) Collected Near Watts Bar Nuclear Plant, Summer and Autumn, 1983 Through 1985 (Hess Sampler Collection).

		Tennessee River Mile				
Season	Year	521.0	526.3	527.4	528.0	528.5
Summer	1983	793	790	514	863	1,082*
	1984	766	1,172	1,194	654	1,162
	1985	1,002	1,888	667	794	781
Autumn	1983	881	826	834	866	752
	1984	901	1,130	1,392	1,754	1,654
	1985	868	941	966	1,015	1,039

*Collected at TRM 528.8.

Table 7-14. Benthic Macroinvertebrate Diversity Index ($\bar{d}$) Values During Preoperational Monitoring (1983), Watts Bar Nuclear Plant, Hess Samples.

		Tennessee River Mile									
		521.0		526.3		527.4		528.0		528.5	
Year	Quarter	No. taxa	$\bar{d}$	No. taxa	$\bar{d}$	No. taxa	$\bar{d}$	No. taxa	$\bar{d}$	No. taxa	$\bar{d}$
1983	Summer	12	0.77	8	0.60	14	1.76	12	1.30	14	1.21*
	Autumn	10	0.93	13	0.99	12	0.97	9	1.47	11	1.55
1984	Summer	19	1.03	20	0.66	15	0.84	18	1.27	17	0.75
	Autumn	16	1.95	14	1.59	17	1.65	20	2.10	18	2.02
1985	Summer	24	2.11	19	2.12	13	1.88	18	2.18	12	2.11
	Autumn	18	2.02	16	1.87	14	2.20	13	2.05	14	2.16

*Data collected from TRM 528.8 in summer 1983.

Table 7-15. **Total Abundance of Macroinvertebrates Collected from Artificial Substrates Following One-Month Colonization Periods Near Watts Bar Nuclear Plant, 1975 Through 1985 (Unbagged Collection).**

		Tennessee River Mile					
Season	Year	496.5	506.6	518.0	527.4	528.0	529.5
Winter	1975	10	11	5	4	15	*
	1976	†	†	†	†	†	*
	1977	†	0	2	0	0	1
	1982	*	*	*	*	*	*
	1983	12	†	1	1	1	0
	1984	57	47	4	3	12	3
	1985	22	21	5	11	11	8
Spring	1975	7	†	20	33	14	*
	1976	14	5	88	27	4	*
	1977	†	70	51	64	†	†
	1982	†	29	16	†	37	90
	1983	†	24	21	†	†	†
	1984	†	†	†	†	†	†
	1985	25	12	18	45	46	52
Summer	1975	†	9	9	30	7	*
	1976	15	21	40	19	6	*
	1977	18	19	30	6	40	†
	1982	10	12	10	54	40	49
	1983	6	7	42	147	†	81
	1984	47	63	293	470	233	358
	1985	116	15	37	10	76	†
Autumn	1975	18	†	30	6	†	*
	1976	†	6	4	1	†	†
	1977	14	15	1	5	3	†
	1982	12	†	†	†	13	2
	1983	24	33	3	26	21	16
	1984	24	17	5	20	27	12
	1985	23	12	2	4	4	1

*No sample required by workplan.
†Substrates not recovered.

Table 7-16. Relative Abundance or Presence of Freshwater Mussel Species Found in the Vicinity of Watts Bar Nuclear Plant (Generally Tennessee River Miles 470-529) During Various Surveys

Species	AD 1–1600	1850–1918	1956–1957	1965	1972–1974	1975–1977	1978	1983–~~1985~~	1993
Actinonaias ligamentina	7.49‡	X	0.1			0.17		0.23	0.26
Actinonaias pectorosa C		X	—					—	—
Alasmidonta marginata		X	—					—	—
Amblema plicata	0.33	X	X		X	2.04	0.93	1.56	1.80
Anodonta grandis				X	X		0.21	0.60	0.87
Anodonta imbecillis								0.02	0.04
Anodonta suborbiculata				X	X			—	0.01
Cumberlandia monodonta		X						—	—
Cyclonaias tuberculata	3.19	X	2.0¶	12.71§		10.22§	6.84§	5.31§	5.95
Cyprogenia stegaria	0.20	X					0.06	0.06	0.04
Dromus dromas CE	35.25*	X					0.06	0.01	0.01
Elliptio crassidens	6.11§	X	12.9†	18.78†	X	42.08*	63.04*	63.62*	62.71
Elliptio dilatatus	11.36†	X	1.1	6.08		0.34	0.21	0.13	0.13
Epioblasma arcaeformis C	1.37	X						—	—
Epioblasma capsaeformis C	0.27	X						—	—
Epioblasma flexuosa	0.09								
Epioblasma florentina C	0.05								
Epioblasma haysiana C	0.37	X							
Epioblasma interrupta C	0.03	X							
Epioblasma lenior C		X							
Epioblasma lewisi		X							
Epioblasma obliquata	T								
Epioblasma propinqua	2.70	X							
Epioblasma propinqua/torulosa	0.11								
Epioblasma stewardsoni C	0.44	X							
Epioblasma torulosa	2.36	X							
Epioblasma triquetra	0.02	X							
Epioblasma turgidula CE	0.06								
Epioblasma/Villosa	0.12								
Fusconaia barnesiana C	0.06	X							
Fusconaia cuneolus CE		X							
Fusconaia ebena			0.1						

Table 7-16 (Continued)

Species	AD 1-1600	1850-1918	1956-1957	1965	1972-1974	1975-1977	1978	1983-1985	
Fusconaia edgariana CE		X						—	—
Fusconaia ~~maculata~~ subrotunda	4.97	X						0.02	0.01
Hemistena lata		X						—	—
Lampsilis fasciola	0.01	X						—	—
Lampsilis orbiculata E		X				0.08	0.57	0.33	0.42
Lampsilis ovata	0.20	X	X				0.09	0.23	0.19
Lasmigona complanata				X				0.01	0.01
Lasmigona costata	T	X						—	0.01
Lemiox rimosus CE	0.09	X						—	—
Leptodea fragilis		X					0.03	0.20	0.33
Leptodea leptodon		X						—	—
Lexingtonia dolabelloides C	0.63	X						—	—
Ligumia recta	0.03	X	X			0.51	0.42	0.43	0.48
Medionidus conradicus C		X						—	—
Megalonaias gigantea							0.15	0.11	0.23
Obliquaria reflexa		X	1.0	6.08	X	1.02	0.87	0.54	0.59
Obovaria olivaria			0.2					—	—
Obovaria retusa	1.64	X						—	—
Obovaria subrotunda	0.64	X						—	—
Plagiola lineolata		X	0.2			4.77¶	2.41¶	1.74	1.78
Plethobasus cicatricosus E	0.73							—	—
Plethobasus cyphyus	0.10	X	1.0	X	X	0.17		0.02	0.02
Plethobasus ~~striatus~~ E cooperianus	0.88	X	X					—	—
Pleurobema clava	0.70							—	—
Pleurobema cordatum	4.88	X	74.6*	31.49*	X	14.99‡	12.50†	15.27†	14.34
Pleurobema oviforme C		X					0.09	0.04	0.06
Pleurobema plenum E	5.58¶	X						0.06	0.04
Pleurobema rubrum	2.20	X					0.03	0.04	0.03
Pleurobema spp.	2.26							—	—
Potamilus alatus	0.01	X	X	6.08		2.39	1.27	2.12¶	2.61
Ptychobranchus fasciolaris	0.91	X	0.1					0.01	0.01
Ptychobranchus subtentum C	0.06	X						—	—
Quadrula cylindrica	0.12	X						—	—

Table 7-16 (Continued)

Species	AD 1-1600	1850-1918	1956-1957	1965	1972-1974	1975-1977	1978	1983-1985	
Quadrula intermedia CE	0.23	X						—	—
Quadrula metanevra	0.68	X	2.9‡			2.39	1.81	1.00	0.86
Quadrula pustulosa	0.34	X	2.2§	18.78‡	X	17.55†	8.10‡	5.70‡	5.42
Quadrula spp.	0.02							—	—
cf. Strophitus undulatus	T	X						—	—
Toxolasma lividus lividus C		X						—	—
Tritogonia verrucosa			0.1			0.68	0.30	0.60	0.77
Truncilla donaciformis			0.1					—	—
Trunicile truncata		X	X					—	—
Villosa fabalis		X						—	—
Villosa nebulosa C		X						—	—
Villosa vanuxemi C	0.06	X						—	—
Total Specimens	27,875	-	-	-	-	587	3,320	~~7,891~~	3455
Species Listed	45	58	~~20~~ 22	10	~~7~~ 6	15	21	~~28~~	30
Combined Species	64			23			28		

Substantial variations exist in the methods employed, areas of coverage and amount of collection effort expended in these collections. Numbers in the table indicate the percentage composition of each species encountered in surveys which included quantitative results.

Symbols:

C-Cumberlandian Species
E-Endangered Species
T-Trace (less than 0.01 percent)
X-Present but not counted

*, †, ‡, §, ¶, indicate the first through fifth most abundant species (respectively) in each quantitive survey.

Table 7-17. Absolute Abundance of Freshwater Mussel Species Found During Various Post-impoundment Surveys of the Tennessee River Near the Watts Bar Nuclear Plant Site

	1957 (Scruggs, 1960)		1965 (Isom, 1969)	1975–1977	1978	1983–1985
Survey Area	TRM 515 8,358 m^2	16.7 m^2	TRM 472–529 99.1 m^2	TRM 520–528 52 m^2	TRM 514–529 1430 team minutes	TRM 520, 526 & 528 1584 team minutes
Technique	Brail	Scuba	Peterson Dredge	Scuba	Scuba	Scuba
No. samples	16	10 x 2 yds^2	359 x 1/3 yds^2	52 x m^2	55 sites	6 x 12 stations
Actinonaias ligamentina		0.0001	0.12		0.0192	0.0114
Amblema plicata	0.0010	0.06		0.1346	0.0217	0.0777
Anodonta grandis					0.0049	0.0297
Anodonta imbecillis						0.0013
Cyclonaias tuberculata	0.0030	0.90	0.0275	1.1538	0.1587	0.2645
Cyprogenia stegaria					0.0014	0.0032
Dromus dromas					0.0014	0.0006
Elliptio crassidens	0.0084	1.32	0.0407	4.7500	1.4636	3.1692
Elliptio dilatatus	0.0008	0.18	0.0132	0.0192	0.0049	0.0063
Fusconaia maculata						0.0013
Lampsilis orbiculata				0.0769	0.0133	0.0164
Lampsilis ovata	0.0001	0.12			0.0021	0.0114
Lasmigona complanata						0.0006
Leptodea fragilis					0.0007	0.0095
Ligumia recta	0.0001	0.06		0.0577	0.0098	0.0215
Megalonaias gigantea					0.0035	0.0057
Obliquaria reflexa	0.0010	0.42	0.0132	0.1154	0.0203	0.0271
Obovaria olivaria	0.0006	0.06				
Plagiola lineolata	0.0004	0.24		0.5385	0.0559	0.0865

Table 7-17 (Continued)

	1957 (Scruggs, 1960)		1965 (Isom, 1969)	1975-1977	1978	1983-1985
Plethobasus crphyus	0.0008	0.06		0.0192		0.0013
Plethobasus striatus	0.0001	0.06				
Pleurobema cordatum	0.0465	12.80	0.0682	1.6923	0.2902	0.7607
Pleurobema oviforme					0.0021	0.0019
Pleurobema plenum						0.0032
Pleurobema rubrum					0.0007	0.0019
Potamilus alatus		0.06	0.0132	0.2692	0.0294	0.1054
Quadrula metanevra	0.0011	2.27		0.2692	0.0420	0.0492
Quadrula pustulosa	0.0029	1.20	0.0407	1.9808	0.1881	0.2841
Tritogonia verrucosa	0.0001	0.06		0.0769	0.0070	0.0297
Total specimens	562	333		587	3320	7891
Species found	16	17	7	15	21	28
Total per m^2	0.0670	19.97	0.2165	11.2885		
Total per team minute					2.3217	4.9817

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TENNESSEE VALLEY AUTHORITY

Office of Natural Resources and Economic Development
Division of Air and Water Resources

PREOPERATIONAL ASSESSMENT OF WATER QUALITY AND BIOLOGICAL RESOURCES OF CHICKAMAUGA RESERVOIR, WATTS BAR NUCLEAR PLANT, 1973-1985

Appendices

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Appendices

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APPENDIX 2-A

ENVIRONMENTAL FACTORS DURING AND PRIOR TO PLANKTON SAMPLING, FEBRUARY 1973-NOVEMBER 7, 1985

Table A-1. Environmental Factors During and Prior to the Plankton Sampling on February 13, 1973

Flow (1000 cfs)	84.3	83.9	79.6	75.3	68.8
Solar (langley/d)	263	294	404	404	219
Turbidity (NTU)	40	35	31	40	30
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	9-11	7-8	5-6	8-9	10-13
Date (1973)	2/9	2/10	2/11	2/12	2/13

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	20 hr	11 hr	5 hr	.65 hr	.5 hr	0	-5 hr
Temp, °C	8.3	9.2	8.2	8.3	--	9.5	8.2
DO, mg/l	9.4	12.6	11.5	11.3	--	10.2	12.6
PH	--	--	--	7.3	--	6.8	--
Alkal, mg/l	--	--	--	57	--	53	--
Secchi Depth, m	--	.8	.8	.8	.8	.8	.8
Inorg N, mg/l	--	--	--	.47	--	.72	--
Org N, mg/l	--	--	--	.12	--	.17	--
Diss P, mg/l	--	--	--	.01	--	.03	--
Total P, mg/l	--	--	--	.03	--	.03	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	3.1	--	2.1	--
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-2. Environmental Factors During and Prior to the Plankton Sampling on March 2, 1973

Flow (1000 cfs)	23.3	24.4	34.6	29.3	19.4
Solar (langley/d)	175	107	232	315	443
Turbidity (NTU)	9	7	7	7	7
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	15-20	8-10	6-8	10-13	4-6
Date (1973)	2/26	2/27	2/28	3/1	3/2

Tennessee River Mile

	496	506	518	527	528	529	532
Travel Time	2.9 day	1.5 day	18 hr	2.5 hr	1.5 hr	0	-18 hr
Temp, °C	6.8	--	--	--	--	--	--
DO, mg/l	11.0	--	--	--	--	--	--
PH	7.4	--	--	--	--	--	--
Alkal, mg/l	51	--	--	--	--	--	--
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	--	--	--	--	--	--	--
Org N, mg/l	--	--	--	--	--	--	--
Diss P, mg/l	--	--	--	--	--	--	--
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	--	--	--	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-3. Environmental Factors During and Prior to the Plankton Sampling on May 23, 1973

Flow (1000 cfs)	26.7	25.1	23.5	24.8	28.6
Solar (langley/d)	358	506	650	419	349
Turbidity (NTU)	--	--	--	--	--
Rainfall (in)	--	.15	--	--	--
Wind Speed (mph)	5-7	7-9	7-9	8-10	6-8
Date (1973)	5/19	5/20	5/21	5/22	5/23

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.5 day	2 day	18 hr	3 hr	2 hr	0	-12 hr
Temp, °C	18.9	18.6	18.1	17.8	18.1	17.8	20.0
DO, mg/l	7.5	--	--	--	--	8.7	--
PH	7.2	--	--	--	--	--	--
Alkal, mg/l	51	--	--	--	--	--	--
Secchi Depth, m	1.25	1.45	1.0	.95	.95	.95	1.5
Inorg N, mg/l	--	--	--	--	--	--	--
Org N, mg/l	--	--	--	--	--	--	--
Diss P, mg/l	--	--	--	--	--	--	--
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	--	--	--	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-4. Environmental Factors During and Prior to the Plankton Sampling on August 22, 1973

Flow (1000 cfs)	39.9	34	29.3	33.2	32.7
Solar (langley/d)	503	492	312	548	477
Turbidity (NTU)	10	9	9	8	7
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	7-9	5-6	7-9	12	8-10
Date (1973)	8/18	8/19	8/20	8/21	8/22

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.8 day	1.5 day	15 hr	2.5 hr	1.75 hr	0	-10 hr
Temp, °C	25.6	26.3	25.6	25.4	--	25.0	26.3
DO, mg/l	5.4	5.7	5.2	4.1	--	5.4	9.0
PH	7.1	--	--	7.3	--	7.1	--
Alkal, mg/l	60	--	--	61	--	59	--
Secchi Depth, m	--	1.5	1.45	1.25	1.25	1.0	1.5
Inorg N, mg/l	--	--	--	1.05	--	--	--
Org N, mg/l	--	--	--	.24	--	.29	--
Diss P, mg/l	--	--	--	.01	--	.03	--
Total P, mg/l	--	--	--	.02	--	.04	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	--	--	--	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-5. Environmental Factors During and Prior to the Plankton Sampling on November 14, 1973

Flow (1000 cfs)	20.9	27.9	22.9	24.8	24.7
Solar (langley/d)	366	353	323	310	247
Turbidity (NTU)	7	7	7	8	7
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	9-11	7-8	5-6	8-9	10-13
Date (1973)	11/10	11/11	11/12	11/13	11/14

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.4 day	1.25 day	14 hr	1.8 hr	1.25 hr	0	-14 hr
Temp, °C	14.3	13.5	14.6	14.6	--	14.2	14.3
DO, mg/l	8.1	8.3	8.1	8.0	--	7.2	8.3
PH	--	--	--	7.1	--	7.6	--
Alkal, mg/l	--	--	--	--	--	54	--
Secchi Depth, m	--	2.0	1.5	1.45	1.5	1.25	1.25
Inorg N, mg/l	--	--	--	.42	--	.44	--
Org N, mg/l	--	--	--	.25	--	.36	--
Diss P, mg/l	--	--	--	<.01	--	<.01	--
Total P, mg/l	--	--	--	.05	--	.031	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	--	--	1.7	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-6. Environmental Factors During and Prior to the Plankton Sampling on May 15, 1974

Flow (1000 cfs)	24	17.6	28.1	27.7	34.8
Solar (langley/d)	407	578	642	673	122
Turbidity (NTU)	36	34	32	30	32
Rainfall (in)	--	1.2	--	--	--
Wind Speed (mph)	6	12-13	3-4	14-15	4-5
Date (1974)	5/11	5/12	5/13	5/14	5/15

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3 day	1.5 day	14 hr	2.5 hr	1.5 hr	0	-10 hr
Temp, °C	18.3	18.3	18.3	18.6	--	19.0	19.9
DO, mg/l	8.0	7.4	7.4	7.6	--	8.0	8.7
PH	--	--	--	--	--	--	--
Alkal, mg/l	--	--	--	--	--	--	--
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	--	--	--	.47	--	.42	--
Org N, mg/l	--	--	--	.12	--	.15	--
Diss P, mg/l	--	--	--	<.01	--	<.01	--
Total P, mg/l	--	--	--	.02	--	.03	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	3.1	--	4.0	--
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-7. Environmental Factors During and Prior to the Plankton Sampling on August 14, 1974

Flow (1000 cfs)	34.5	34.7	35.8	31	27.6
Solar (langley/d)	431	364	218	473	474
Turbidity (NTU)	6	4	6	8	10
Rainfall (in)	--	--	.4	--	--
Wind Speed (mph)	2-3	10	8-12	5	5-6
Date (1974)	8/10	8/11	8/12	8/13	8/14

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.9 day	1.7 day	18 hr	3 hr	2 hr	0	-13 hr
Temp, °C	24.8	26.0	24.5	24.5	--	25.3	25.5
DO, mg/l	5.4	9.0	4.8	5.8	--	6.2	9.0
PH	--	--	--	--	--	7.4	--
Alkal, mg/l	--	--	--	--	--	--	--
Secchi Depth, m	--	1.5	1.5	1.2	1.2	1.2	2.4
Inorg N, mg/l	--	--	--	.41	--	.38	--
Org N, mg/l	--	--	--	.14	--	.26	--
Diss P, mg/l	--	--	--	.02	--	<.01	--
Total P, mg/l	--	--	--	.02	--	.04	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	1.6	--	1.8	--
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-8. Environmental Factors During and Prior to the Plankton Sampling on November 13, 1974

Flow (1000 cfs)	23.9	19.3	20.1	27.9	28.9
Solar (langley/d)	344	273	60	213	304
Turbidity (NTU)	10	10	10	10	11
Rainfall (in)	--	--	--	.5	--
Wind Speed (mph)	4-6	5	7-9	10-13	14-15
Date (1974)	11/9	11/10	11/11	11/12	11/13

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2 day	1 day	12 hr	1.5 hr	1 hr	0	-12 hr
Temp, °C	14.5	15.5	15.5	16.0	--	16.0	16.0
DO, mg/l	8.7	7.9	7.9	7.7	--	7.8	7.4
PH	7.4	7.4	7.4	7.5	--	--	7.5
Alkal, mg/l	--	--	--	--	--	--	--
Secchi Depth, m	--	1.75	1.25	1.25	1.25	1.15	1.15
Inorg N, mg/l	--	--	--	.37	--	.36	--
Org N, mg/l	--	--	--	.24	--	.11	--
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	--	--	--	.03	--	.02	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	3.2	--	2.9	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-9. Environmental Factors During and Prior to the Plankton Sampling on February 5, 1975

Flow (1000 cfs)	60.3	60.3	72	83.7	85.4
Solar (langley/d)	131	137	104	32	55
Turbidity (NTU)	30	24	20	20	20
Rainfall (in)	--	.8	.3	.5	.65
Wind Speed (mph)	4-6	8-10	4-8	7-8	8-12
Date (1975)	2/1	2/2	2/3	2/4	2/5

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	16 hr	9 hr	4 hr	0.5 hr	0.3 hr	0	-4 hr
Temp, °C	8.5	8.5	8.0	8.2	--	9.0	8.5
DO, mg/l	12.0	12.8	12.9	12.9	--	10.4	12.6
PH	6.7	7.0	--	7.3	--	7.5	--
Alkal, mg/l	--	--	--	54	--	51	--
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	--	--	--	.66	--	.61	--
Org N, mg/l	--	--	--	.11	--	.13	--
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	--	--	--	.03	--	.02	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	2.7	--	2.1	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-10. Environmental Factors During and Prior to the Plankton Sampling on May 21, 1975

Date (1975)	5/17	5/18	5/19	5/20	5/21
Flow (1000 cfs)	30.1	28.1	25.4	27.4	31.6
Solar (langley/d)	222	489	627	571	550
Turbidity (NTU)	15	20	20	24	28
Rainfall (in)	--	1.2	--	--	--
Wind Speed (mph)	2-3	5-7	4	3-4	4

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.2 day	1.7 day	16 hr	2.5 hr	2 hr	0	-11 hr
Temp, °C	21.2	21.5	20.8	19.4	--	19.5	21.7
DO, mg/l	6.6	7.6	6.0	6.4	--	6.6	8.7
PH	7.2	7.4	7.2	7.7	--	7.3	8.2
Alkal, mg/l	--	--	--	56	--	57	--
Secchi Depth, m	--	1.1	1.0	.7	.8	.8	1.8
Inorg N, mg/l	--	--	--	.43	--	.41	--
Org N, mg/l	--	--	--	.09	--	.12	--
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	--	--	--	.02	--	.02	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	1.6	--	1.6	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-11. Environmental Factors During and Prior to the Plankton Sampling on August 6, 1975

Flow (1000 cfs)	35.2	34.4	24.3	27.3	28.3
Solar (langley/d)	459	480	349	326	273
Turbidity (NTU)	27	29	28	29	27
Rainfall (in)	.3	--	.4	.15	.8
Wind Speed (mph)	6	6-7	5-7	7-8	7-8
Date (1975)	8/2	8/3	8/4	8/5	8/6

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.3 day	1.8 day	18 hr	3 hr	2 hr	0	-13 hr
Temp, °C	26.0	27.0	25.0	25.0	--	25.5	27.8
DO, mg/l	5.8	7.5	4.8	4.3	--	4.7	8.6
PH	--	--	--	7.2	--	7.1	--
Alkal, mg/l	--	--	--	61	--	61	--
Secchi Depth, m	--	1.3	1.15	.95	.95	.75	1.75
Inorg N, mg/l	--	--	--	.36	--	.33	--
Org N, mg/l	--	--	--	.22	--	.17	--
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	--	--	--	.03	--	.02	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	1.7	--	2.1	--
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-12. Environmental Factors During and Prior to the Plankton Sampling on November 11, 1975

Flow (1000 cfs)	20.7	12.2	19.9	24.8	22.9
Solar (langley/d)	335	295	299	244	238
Turbidity (NTU)	20	19	19	18	18
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	6-7	2-3	5-8	3-4	3-4
Date (1975)	11/1	11/2	11/3	11/4	11/5

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.5 day	1.3 day	15 hr	2 hr	1.4 hr	0	-16 hr
Temp, °C	18.1	18.1	17.4	17.4	--	17.2	17.9
DO, mg/l	7.9	10.7	8.0	8.1	--	8.1	10
PH	--	--	--	7.0	--	7.0	--
Alkal, mg/l	--	--	--	39	--	40	--
Secchi Depth, m	--	1.95	1.45	1.10	1.0	1.0	1.15
Inorg N, mg/l	--	--	--	.41	--	.22	--
Org N, mg/l	--	--	--	.17	--	.13	--
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	--	--	--	.01	--	.01	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	--	--	2.8	--	2.8	--
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-13. Environmental Factors During and Prior to the Plankton Sampling on February 12, 1976

Flow (1000 cfs)	27.4	32.9	29.8	25.1	25.3
Solar (langley/d)	366	367	297	119	370
Turbidity (NTU)	31	28	27	28	28
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	8-10	4-5	16-20	5-8	9-10
Date (1976)	2/8	2/9	2/10	2/11	2/12

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.2 day	1.2 day	14 hr	1.8 hr	1.2 hr	0	-14 hr
Temp, °C	6.2	5.7	5.7	6.0	--	6.0	6.2
DO, mg/l	11.2	12.0	11.8	11.8	--	11.4	11.6
PH	7.6	7.8	7.5	7.4	--	7.5	7.6
Alkal, mg/l	50	55	55	58	--	56	53
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	--	.62	.60	.62	--	.63	.64
Org N, mg/l	--	.13	.13	.14	--	.20	.14
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	--	.03	.04	.05	--	.04	.04
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	--	1.6	1.5	1.7	--	1.7	1.7
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-14. Environmental Factors During and Prior to the Plankton Sampling on May 5, 1976

Flow (1000 cfs)	9.9	8.5	15.0	14.0	14.5
Solar (langley/d)	191	574	647	675	598
Turbidity (NTU)	16	16	16	16	18
Rainfall (in)	.7	.2	--	--	--
Wind Speed (mph)	3-4	8-9	8-11	3-4	9-10
Date (1976)	5/1	5/2	5/3	5/4	5/5

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	7 day	4 day	1.5 day	6 hr	4 hr	0	-1 day
Temp, °C	17.5	17.5	17.3	17.3	17.3	17.5	18.6
DO, mg/l	8.3	7.8	8.3	7.4	7.8	7.8	8.9
PH	7.2	7.2	7.4	7.4	7.5	7.4	7.9
Alkal, mg/l	44	47	48	51	51	51	55
Secchi Depth, m	--	1.5	1.5	1.1	1.05	1.0	1.3
Inorg N, mg/l	.31	.37	.31	.35	.36	.27	.25
Org N, mg/l	.11	.13	.10	.18	.05	.13	.14
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	.03	.03	.03	.02	.02	.02	.02
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	2.4	2.2	1.9	2.5	2.3	2.4	2.2
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-15. Environmental Factors During and Prior to the Plankton Sampling on August 4, 1976

Flow (1000 cfs)	35.7	32.1	32.4	20	21.9
Solar (langley/d)	545	565	635	663	640
Turbidity (NTU)	31	31	33	33	34
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	6-7	9-10	10-12	6-8	4-5
Date (1976)	7/31	8/1	8/2	8/3	8/4

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.5 day	2.25 day	1 day	3.7 hr	2.5 hr	0	-16 hr
Temp, °C	24.6	25.0	25.0	25.0	24.4	24.0	25.4
DO, mg/l	5.6	5.8	6.0	6.2	4.6	5.4	8.2
PH	7.2	7.2	7.2	7.4	7.0	7.2	8.4
Alkal, mg/l	45	47	49	48	48	48	46
Secchi Depth, m	--	1.6	1.6	1.45	1.35	1.0	1.5
Inorg N, mg/l	.35	.32	.35	.37	.35	.32	.23
Org N, mg/l	.12	.14	.14	.06	.12	.13	.13
Diss P, mg/l	--	--	--	.02	--	.02	--
Total P, mg/l	.04	.02	.02	.03	.02	.03	.02
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	2.4	1.7	1.9	2.1	2.0	2.1	2.4
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-16. Environmental Factors During and Prior to the Plankton Sampling on November 4, 1976

Date (1976)	10/31	11/1	11/2	11/3	11/4
Flow (1000 cfs)	32.1	32.8	32.1	31.7	32.1
Solar (langley/d)	63	319	344	265	366
Turbidity (NTU)	19	19	18	15	15
Rainfall (in)	.85	--	--	--	--
Wind Speed (mph)	6-7	8-9	8-9	7-8	8-9

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	1.8 day	1 day	10 hr	1.5 hr	1 hr	0	-11 hr
Temp, °C	13.6	13.5	13.2	13.5	13.4	13.2	13.4
DO, mg/l	8.7	9.2	9.3	8.8	8.9	9.1	8.8
PH	7.3	7.4	7.4	7.5	7.4	7.4	7.4
Alkal, mg/l	48	52	52	53	51	50	51
Secchi Depth, m	--	1.8	1.5	1.5	1.5	1.2	1.5
Inorg N, mg/l	.36	.38	.35	.34	.38	.36	.34
Org N, mg/l	.08	.12	.10	.14	.08	.15	.15
Diss P, mg/l	--	--	--	.02	--	.01	--
Total P, mg/l	.03	.03	.03	.03	.02	.02	.03
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	1.8	1.9	1.9	1.8	2.0	1.7	2.0
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-17. Environmental Factors During and Prior to the Plankton Sampling on February 9, 1977

Flow (1000 cfs)	17.6	17.7	23.2	29.8	27.9
Solar (langley/d)	403	395	387	390	382
Turbidity (NTU)	24	--	22	24	24
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	10-12	5-7	8-10	3-5	4
Date (1977)	2/5	2/6	2/7	2/8	2/9

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2 day	1 day	12 hr	1.6 hr	1 hr	0	-13 hr
Temp, °C	2.2	2.5	2.5	2.5	2.5	2.5	2.5
DO, mg/l	13.2	13.4	13.2	13.4	13.2	13.0	13.0
PH	8.0	7.9	8.0	7.8	8.0	7.8	8.0
Alkal, mg/l	62	60	58	59	59	59	60
Secchi Depth, m	--	1.3	1.3	1.3	1.35	1.35	1.3
Inorg N, mg/l	.51	.46	.47	.48	.47	.45	.47
Org N, mg/l	.08	.12	.10	.12	.14	.20	.09
Diss P, mg/l	--	--	--	.01	--	.01	--
Total P, mg/l	.03	.02	.02	.02	.01	.02	.02
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	3.9	2.1	2.0	3.0	1.8	2.3	1.9
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-18. Environmental Factors During and Prior to the Plankton Sampling on May 3, 1977

Date (1977)	4/29	4/30	5/1	5/2	5/3
Flow (1000 cfs)	35.5	29.3	28.5	28.0	27.3
Solar (langley/d)	333	341	446	238	224
Turbidity (NTU)	20	20	20	20	20
Rainfall (in)	--	--	--	.38	.32
Wind Speed (mph)	7-9	6-8	7-9	4-5	4-6

Tennessee River Mile

	496	506	518	527	528	529	532
Travel Time	3.2 day	1.8 day	18 hr	3 hr	2 hr	0	-13 hr
Temp, °C	17.2	16.8	16.8	16.6	16.8	17.5	18.0
DO, mg/l	8.4	8.3	8.5	7.6	8.7	8.7	10.2
PH	7.2	7.2	7.2	7.4	7.2	6.5	7.8
Alkal, mg/l	68	69	32	39	59	46	66
Secchi Depth, m	--	1.0	1.0	1.0	1.0	1.0	--
Inorg N, mg/l	.46	.47	.45	.45	.44	.43	.42
Org N, mg/l	.04	.12	.10	.06	.06	.08	.15
Diss P, mg/l	--	--	--	--	--	.01	--
Total P, mg/l	.02	.03	.02	.03	.02	.02	.03
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	1.5	1.8	1.8	3.6	1.4	2.2	2.0
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-19. Environmental Factors During and Prior to the Plankton Sampling on August 2, 1977

Flow (1000 cfs)	20.2	28.4	28.2	24.4	21
Solar (langley/d)	82	501	471	397	586
Turbidity (NTU)	20	20	--	20	20
Rainfall (in)	--	.5	--	--	--
Wind Speed (mph)	9-11	3-4	6-7	3-4	4-5
Date (1977)	7/29	7/30	7/31	8/1	8/2

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.6 day	2.2 day	1 day	4 hr	3 hr	0	-17 hr
Temp, °C	26.3	27.5	26.0	25.5	26.2	26.1	27.0
DO, mg/l	3.7	3.6	3.5	4.5	4.1	5.3	4.7
PH	7.3	7.2	7.2	6.3	7.5	7.5	8.4
Alkal, mg/l	52	58	55	55	53	54	54
Secchi Depth, m	1.25	1.5	1.5	1.0	1.0	1.0	1.5
Inorg N, mg/l	.36	.36	.34	.32	.30	.36	.17
Org N, mg/l	.14	.10	.11	.11	.13	.11	.18
Diss P, mg/l	--	--	--	.02	--	.01	--
Total P, mg/l	.02	.02	.02	.02	.03	.03	.02
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	1.9	1.0	2.0	1.8	1.6	1.5	2.3
Chlorophyll *a*, ug/l	--	--	--	--	--	--	--

Table A-20. Environmental Factors During and Prior to the Plankton Sampling on November 8, 1977

Flow (1000 cfs)	32.3	9.9	10.9	17.9	36.1
Solar (langley/d)	82	74	104	94	161
Turbidity (NTU)	29	29	27	27	26
Rainfall (in)	.2	.55	.3	--	--
Wind Speed (mph)	4-6	4-5	2-3	5-6	3-5
Date (1977)	11/4	11/5	11/6	11/7	11/8

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.2 day	21 hr	9 hr	1.2 hr	.85 hr	0	-10 hr
Temp, °C	17.1	17.2	17.0	16.8	17.0	16.9	17.4
DO, mg/l	6.7	6.6	6.7	8.6	6.7	8.7	7.3
PH	7.2	7.2	7.2	7.3	7.2	7.4	7.4
Alkal, mg/l	48	50	51	49	48	50	56
Secchi Depth, m	1.0	1.5	1.0	1.0	1.5	1.0	1.25
Inorg N, mg/l	.39	.54	.58	.38	.36	.48	.57
Org N, mg/l	.07	.08	.03	.11	.08	.09	.09
Diss P, mg/l	--	--	--	.01	--	--	--
Total P, mg/l	.03	.03	.03	.03	.03	.02	.05
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	1.5	2.5	1.9	3.2	1.5	2.1	2.3
Chlorophyll a, ug/l	--	--	--	--	--	--	--

Table A-21. Environmental Factors During and Prior to the Plankton Sampling on May 10, 1982

Flow (1000 cfs)	8.3	8.4	9.1	9.3	8.7
Solar (langley/d)	407	176	431	637	674
Turbidity (NTU)	3.8	2.9	3.2	3.2	2.9
Rainfall (in)	--	.41	--	--	--
Wind Speed (mph)	6-9	13-14	9-10	6-8	3-4
Date (1982)	5/6	5/7	5/8	5/9	5/10

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	11 day	6 day	3.3 day	9 hr	6 hr	0	-1.5 day
Temp, °C	19.4	18.4	17.8	17.0	17.5	16.5	19.7
DO, mg/l	10.4	9.2	9.1	8.0	8.3	8.1	11.0
PH	8.2	7.9	8.1	7.7	7.8	7.8	8.8
Alkal, mg/l	59	67	--	66	66	67	70
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	.16	.29	.28	.36	.40	.34	.21
Org N, mg/l	.21	.32	.61	.32	.32	.28	.58
Diss P, mg/l	--	--	--	--	--	--	--
Total P, mg/l	.03	.01	.03	.02	<.01	.01	.02
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	4.1	3.5	2.7	2.8	2.3	4.6	3.5
Chlorophyll *a*, ug/l	7.9	2.4	2.8	2.5	1.5	3.5	6.5

Table A-22. Environmental Factors During and Prior to the Plankton Sampling on August 12, 1982

Flow (1000 cfs)	24.8	27.9	33.9	35.6	38.9
Solar (langley/d)	449	382	442	337	445
Turbidity (NTU)	2.5	3.9	3.4	2.9	2.9
Rainfall (in)	.50	.61	.35	.13	--
Wind Speed (mph)	6-7	8-10	4-6	5-6	5-6
Date (1982)	8/8	8/9	8/10	8/11	8/12

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.5 day	1.3 day	13 hr	2 hr	1.5 hr	0	-9 hr
Temp, °C	25.6	25.9	26.0	25.8	25.5	25.0	27.0
DO, mg/l	5.6	5.5	5.5	6.5	6.2	5.5	10.5
PH	7.3	7.4	7.1	7.4	7.3	7.2	8.2
Alkal, mg/l	66	69	70	71	74	--	74
Secchi Depth, m	1.5	1.75	1.5	1.25	1.25	1.25	1.5
Inorg N, mg/l	.31	.31	.29	.22	.26	.29	.06
Org N, mg/l	.31	.30	.29	.38	.40	.25	.46
Diss P, mg/l	.01	.01	<.01	<.01	<.01	<.01	<.01
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	3.2	2.8	2.7	3.3	3.4	3.0	3.7
Chlorophyll *a*, ug/l	2.2	2.2	4.5	7.1	6.3	3.9	17.8

Table A-23. Environmental Factors During and Prior to the Plankton Sampling on November 9, 1982

Flow (1000 cfs)	26	29.4	24.7	27.2	28.5
Solar (langley/d)	388	373	364	320	28.6
Turbidity (NTU)	2.8	2.8	2.7	2.8	2.7
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	7-8	3-4	1-3	1-2	2-4
Date (1982)	11/5	11/6	11/7	11/8	11/9

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2 day	1.1 day	12 hr	1.5 hr	1 hr	0	-13 hr
Temp, °C	15.2	15.4	15.4	15.0	15.0	15.0	15.0
DO, mg/l	9.6	7.8	8.3	8.3	8.3	8.4	8.1
PH	7.1	7.1	7.1	7.5	7.5	7.5	7.5
Alkal, mg/l	65	69	69	65	66	--	65
Secchi Depth, m	1.75	2.75	2.0	--	--	--	--
Inorg N, mg/l	.34	.37	.36	.34	.38	.34	.36
Org N, mg/l	.18	.17	.23	.26	.24	.26	.24
Diss P, mg/l	.01	.01	<.01	<.01	<.01	.01	.01
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	2.6	2.7	2.7	3.0	2.7	2.5	2.9
Chlorophyll a, ug/l	1.9	2.0	2.5	5.5	5.0	5.5	6.0

Table A-24. Environmental Factors During and Prior to the Plankton Sampling on February 17, 1983

Flow (1000 cfs)	42.8	42.8	42.8	42.7	42.8
Solar (langley/d)	308	394	322	181	426
Turbidity (NTU)	7	6	11	5	4
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	4-5	5-6	2-4	2-3	8-10
Date (1983)	2/13	2/14	2/15	2/16	2/17

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	1.3 day	18 hr	8 hr	1 hr	0.7 hr	0	-8 hr
Temp, °C	6.8	6.5	6.6	6.0	5.5	5.5	6.0
DO, mg/l	12.9	12.6	12.3	11.4	11.6	13.5	11.4
PH	7.7	7.7	7.7	7.6	7.6	7.6	7.6
Alkal, mg/l	63	63	63	59	58	--	60
Secchi Depth, m	--	--	--	1.3	1.5	1.3	1.5
Inorg N, mg/l	.49	.50	.49	.46	.47	.47	.48
Org N, mg/l	.13	.11	.28	.35	.38	.35	.23
Diss P, mg/l	.02	.02	.02	.02	.02	.02	.02
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	2.9	2.0	2.3	2.2	3.3	2.9	2.4
Chlorophyll *a*, ug/l	3.7	4.1	4.8	4.0	4.3	3.9	3.7

Table A-25. Environmental Factors During and Prior to the Plankton Sampling on June 2, 1983

Flow (1000 cfs)	39.2	39.4	48.6	50.4	47.1
Solar (langley/d)	511	715	461	593	719
Turbidity (NTU)	9	10	11	9	8
Rainfall (in)	.20	--	--	--	--
Wind Speed (mph)	9-12	7-9	4-6	6-7	5-6
Date (1983)	5/29	5/30	5/31	6/1	6/2

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2 day	1 day	11 hr	1.8 hr	1.2 hr	0	-8 hr
Temp, °C	19.7	19.8	19.7	19.5	19.0	19.5	19.7
DO, mg/l	9.8	10.0	10.2	7.9	8.1	10.4	9.6
PH	7.0	7.0	7.0	7.3	7.2	7.2	7.5
Alkal, mg/l	48	49	51	46	47	47	48
Secchi Depth, m	--	--	--	1.25	--	1.0	1.25
Inorg N, mg/l	.32	.32	.32	.31	.30	.30	.25
Org N, mg/l	.20	.12	.15	.20	.17	.19	.24
Diss P, mg/l	.01	.01	.01	.01	.01	.01	.01
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	2.3	2.3	2.7	2.6	2.5	2.5	3.4
Chlorophyll *a*, ug/l	3.0	2.7	5.8	5.5	5.7	3.7	7.3

Table A-26. Environmental Factors During and Prior to the Plankton Sampling on August 11, 1983

Flow (1000 cfs)	26.4	33.8	33.5	33.3	33.2
Solar (langley/d)	456	497	546	573	540
Turbidity (NTU)	4	4	4	4	4
Rainfall (in)	--	--	--	--	--
Wind Speed (mph)	4-6	3-6	4-6	4	9-13
Date (1983)	8/7	8/8	8/9	8/10	8/11

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.7 day	1.5 day	15 hr	2.5 hr	1.7 hr	0	-11 hr
Temp, °C	25.8	25.7	25.0	25.0	25.0	24.5	28.5
DO, mg/l	5.7	5.3	5.2	5.7	5.9	5.2	11.8
PH	7.2	7.2	7.3	7.4	--	7.2	10.6
Alkal, mg/l	64	68	68	--	--	--	--
Secchi Depth, m	--	--	--	--	--	--	1.5
Inorg N, mg/l	.28	.31	.28	.28	.29	.30	<.01
Org N, mg/l	.08	.13	.17	.18	.16	.16	.28
Diss P, mg/l	.01	.01	.01	<.01	<.01	<.01	<.01
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	3.4	3.4	2.8	3.6	3.7	3.0	4.0
Chlorophyll _a_, ug/l	2.4	1.8	3.2	2.6	3.1	3.3	9.3

Table A-27. Environmental Factors During and Prior to the Plankton Sampling on November 21, 1983

Date (1983)	11/17	11/18	11/19	11/20	11/21
Flow (1000 cfs)	25.6	21.6	14.5	12.9	22.4
Solar (langley/d)	320	297	299	76	271
Turbidity (NTU)	3	3	3	4	4
Rainfall (in)	--	--	--	1.20	--
Wind Speed (mph)	3-4	8-10	9-11	10-15	3-4

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.3 day	1.7 day	15 hr	2 hr	1.4 hr	0	-16 hr
Temp, °C	13.9	14.5	14.5	14.5	14.5	14.5	14.5
DO, mg/l	8.9	9.1	9.4	8.8	8.7	8.7	8.7
PH	7.3	7.3	7.3	7.7	7.4	8.7	7.4
Alkal, mg/l	59	62	62	61	60	61	60
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	.27	.28	.28	.28	.27	.26	.30
Org N, mg/l	.13	.15	.18	.06	.06	.07	.12
Diss P, mg/l	.01	.02	.03	.01	.01	.01	.01
Total P, mg/l	--	--	--	--	--	--	--
Diss Org C, mg/l	--	--	--	--	--	--	--
Total Org C, mg/l	3.1	2.6	3.1	2.7	2.9	1.7	3.3
Chlorophyll *a*, ug/l	.85	.89	2.6	4.0	4.5	3.7	4.9

Table A-28. Environmental Factors During and Prior to the Plankton Sampling on February 14, 1984

Flow (1000 cfs)	16.6	17.2	17.3	17.2	30.6
Solar (langley/d)	43	192	185	50	395
Turbidity (NTU)	4.8	4.9	4.8	5.0	12.0
Rainfall (in)	.20	.06	.51	.48	--
Wind Speed (mph)	3-5	7-9	13-15	3-5	5-7
Date (1984)	2/10	2/11	2/12	2/13	2/14

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	1.9 day	1 day	11 hr	1.5 hr	1 hr	0	-12 hr
Temp, °C	7.1	5.8	6.1	5.0	4.9	4.8	4.8
DO, mg/l	11.0	11.7	11.3	9.6	10.0	10.1	10.6
PH	7.3	7.4	7.5	7.5	7.5	7.3	7.5
Alkal, mg/l	44	45	47	47	48	47	47
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	.40	.46	.45	.45	.45	.45	.43
Org N, mg/l	.13	.05	.11	.12	.20	.21	.25
Diss P, mg/l	.01	.01	.01	.01	.01	.01	.04
Total P, mg/l	.03	.03	.03	.05	.05	.04	.07
Diss Org C, mg/l	1.5	1.7	1.9	1.3	1.5	1.6	1.2
Total Org C, mg/l	2.4	2.2	3.0	2.2	2.3	2.3	2.5
Chlorophyll *a*, ug/l	6.4	7.3	9.3	12.0	11.0	10.7	13.1

Table A-29. Environmental Factors During and Prior to the Plankton Sampling on May 24, 1984

Date (1984)	5/20	5/21	5/22	5/23	5/24
Flow (1000 cfs)	43.8	39.8	38.5	37.7	40.1
Solar (langley/d)	688	252	418	388	731
Turbidity (NTU)	15	15	11	9	10
Rainfall (in)	--	.20	--	.25	--
Wind Speed (mph)	7-9	5-8	5-8	7-9	3-5

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.25 day	1.25 day	13 hr	2 hr	1.5 hr	0	-9 hr
Temp, °C	17.6	17.0	17.7	17.8	17.6	16.9	19.1
DO, mg/l	8.8	9.2	9.1	9.5	9.5	9.6	10.9
PH	7.4	7.1	7.2	7.4	7.4	7.4	7.8
Alkal, mg/l	57	61	58	63	63	65	65
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	.46	.51	.49	.49	.48	.53	.40
Org N, mg/l	.08	.04	.08	.16	.15	.10	.30
Diss P, mg/l	.01	.01	.01	.01	.01	.01	.01
Total P, mg/l	.02	.02	.02	.02	.02	.03	.03
Diss Org C, mg/l	1.8	1.7	1.3	1.2	1.2	1.2	1.2
Total Org C, mg/l	1.9	2.0	1.5	1.5	1.3	1.5	1.3
Chlorophyll *a*, ug/l	2.3	1.6	3.5	4.9	5.4	3.5	8.7

Table A-30. Environmental Factors During and Prior to the Plankton Sampling on August 14, 1984

Flow (1000 cfs)	31.5	32.3	32.5	32.6	32.6
Solar (langley/d)	480	444	596	593	587
Turbidity (NTU)	5.8	4.8	4.6	3.4	3.4
Rainfall (in)	.02	--	--	--	--
Wind Speed (mph)	3-5	3-5	4-6	3-5	2-4
Date (1984)	8/10	8/11	8/12	8/13	8/14

	Tennessee River Mile 496	506	518	527	528	529	532
Travel Time	2.8 day	1.5 day	16 hr	2.5 hr	1.8 hr	0	-11 hr
Temp, °C	25.4	25.8	25.0	25.3	25.3	25.9	27.4
DO, mg/l	5.3	4.4	4.6	4.9	5.0	4.8	9.0
PH	7.0	7.0	6.9	7.7	7.8	7.7	8.7
Alkal, mg/l	59	61	59	58	60	60	56
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	.31	.34	.31	.31	.30	.23	.15
Org N, mg/l	.13	.15	.18	.16	.16	.11	.31
Diss P, mg/l	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Total P, mg/l	.01	.01	.02	.03	.02	.01	.03
Diss Org C, mg/l	1.9	1.9	1.7	1.8	1.7	1.9	1.9
Total Org C, mg/l	2.1	2.1	2.1	2.3	2.2	2.3	2.2
Chlorophyll _a_, ug/l	2.3	2.0	4.1	4.8	5.1	4.6	10.0

Table A-31. Environmental Factors During and Prior to the Plankton Sampling on November 14, 1984

Flow (1000 cfs)	13.4	15.9	26.4	27.4	23.3
Solar (langley/d)	25	74	293	352	335
Turbidity (NTU)	2.6	3.3	6.1	3.6	4.3
Rainfall (in)	.76	--	--	--	--
Wind Speed (mph)	7-9	6-8	7-9	5-7	3-5
Date (1984)	11/10	11/11	11/12	11/13	11/14

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.5 day	1.4 day	15 hr	2 hr	1.3 hr	0	-15 hr
Temp, °C	14.5	15.4	15.7	16.0	15.9	15.7	15.6
DO, mg/l	7.3	6.9	6.9	8.1	7.9	8.1	8.2
PH	7.8	8.0	7.9	7.4	7.4	7.4	7.4
Alkal, mg/l	62	65	63	68	67	73	67
Secchi Depth, m	--	--	--	--	--	--	--
Inorg N, mg/l	.29	.30	.30	.28	.30	.29	.27
Org N, mg/l	.14	.15	.18	.13	.10	.10	.26
Diss P, mg/l	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Total P, mg/l	.05	.05	.03	.03	.02	.01	.01
Diss Org C, mg/l	1.2	1.2	1.2	1.2	1.2	1.2	1.1
Total Org C, mg/l	1.8	1.5	1.5	1.4	1.5	1.5	1.7
Chlorophyll a, ug/l	1.0	1.1	2.0	2.7	2.8	2.5	3.4

Table A-32. Environmental Factors During and Prior to the Plankton Sampling on February 20, 1985.

Date (1985)	2/16	2/17	2/18	2/19	2/20
Flow (1000 cfs)	30.6	27.3	27.6	27.6	32.1
Solar (langley/d)	426	331	140	167	360
Turbidity (NTU)	5.8	6.8	8.3	9.8	21
Rainfall (in)	0	0	0.01	0.01	0
Wind Speed (mph)	1-7	1-7	1-6	1-5	1-5

Tennessee River Mile	496	506	518	527	528	529	532
Travel Time	1.8 day	1 day	11 hr.	1.5 hr.	1 hr.	0	-11 hr.
Temp, °C	3.1	2.8	2.7	3.1	3.2	3.1	2.8
DO, mg/l	12.5	12.2	11.8	11.9	11.8	11.8	12.3
PH	8.0	7.4	7.6	7.5	7.3	8.9	7.4
Alkal, mg/l	52	53	51	49	49	50	48
Secchi Depth, m	0.75	1.0	0.75	1.0	1.0	1.0	1.0
Inorg N, mg/l	0.46	0.50	0.50	0.49	0.50	0.50	0.53
Org N, mg/l	0.23	0.19	0.28	0.29	0.24	0.25	0.18
Diss P, mg/l	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total P, mg/l	0.04	0.03	0.04	0.03	0.04	0.04	0.04
Diss Org C, mg/l	1.0	1.2	---	1.0	0.9	1.0	1.0
Total Org C, mg/l	1.6	2.0	1.5	1.7	1.6	1.8	1.8
Chlorophyll *a*, ug/l	4.8	5.8	5.4	4.8	4.5	5.1	1.7

Table A-33. Environmental Factors During and Prior to the Plankton Sampling on May 14,1985

Flow (1000 cfs)	6.00	3.6	5.7	5.4	7.1
Solar (langley/d)	403	547	360	662	533
Turbidity (NTU)	4.5	4.2	4.6	8.2	4.9
Rainfall (in)	0	0	0.01	0	0
Wind Speed (mph)	1-5	1-8	1-8	1-4	1-5
Date (1985)	5/10	5/11	5/12	5/13	5/14

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	13 day	6.9 day	3.0 day	11.5 hr.	8.3 hr.	0	-2.2 day
Temp, °C	21.0	20.0	18.8	18.1	17.8	18.2	18.9
DO, mg/l	8.1	8.1	6.1	5.1	5.0	5.6	6.4
PH	7.7	7.9	7.5	7.4	7.4	7.5	8.0
Alkal, mg/l	55	60	59	60	60	60	62
Secchi Depth, m	1.25	0.75	1.5	2.1	2.0	1.70	1.75
Inorg N, mg/l	0.16	0.22	0.34	0.33	0.32	0.34	0.06
Org N, mg/l	0.24	0.44	0.18	0.19	0.19	0.15	0.40
Diss P, mg/l	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total P, mg/l	0.04	0.05	0.02	0.01	0.02	0.03	0.03
Diss Org C, mg/l	2.6	2.3	1.9	1.9	2.1	2.1	2.2
Total Org C, mg/l	2.7	2.8	2.1	2.1	2.3	2.4	2.3
Chlorophyll *a*, ug/l	5.4	27.1	10.06	4.7	4.5	4.1	15.3

Table A-34. Environmental Factors During and Prior to the Plankton Sampling on August 20, 1985.

Flow (1000 cfs)	15.5	22.4	23.3	21.0	26.4
Solar (langley/d)	259	144	648	576	259
Turbidity (NTU)	3.2	2.8	3.6	2.9	3.0
Rainfall (in)	0.07	0.06	0	0	0.01
Wind Speed (mph)	1-9	1-10	1-8	1-4	1-9
Date (1985)	8/16	8/17	8/18	8/19	8/20

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	3.5 day	1.9 day	19.6 hr	3.1 hr.	2.2 hr.	0	-14.3 hr
Temp, °C	26.4	26.5	25.5	25.9	26.1	26.4	26.5
DO, mg/l	4.1	3.5	3.4	3.6	3.5	4.0	4.5
PH	7.5	7.9	7.8	7.4	7.5	7.6	7.8
Alkal, mg/l	63	68	67	71	71	71	69
Secchi Depth, m	----	----	----	----	----	----	----
Inorg N, mg/l	0.24	0.28	0.28	0.30	0.25	0.23	0.04
Org N, mg/l	0.22	0.18	0.21	0.19	0.22	0.21	0.32
Diss P, mg/l	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Total P, mg/l	0.01	0.04	0.03	0.03	0.03	0.03	0.03
Diss Org C, mg/l	2.7	2.9	2.8	3.3	3.2	2.6	3.2
Total Org C, mg/l	3.2	3.8	3.2	3.5	3.7	3.5	3.6
Chlorophyll <u>a</u>, ug/l	4.07	2.8	4.5	6.0	7.1	9.8	18.0

Table A-35. Environmental Factors During and Prior to the Plankton Sampling on November 7, 1985.

Flow (1000 cfs)	7.2	13.2	18.9	20.7	23.5
Solar (langley/d)	58	43	72	216	72
Turbidity (NTU)	3.2	3.4	4.7	4.1	3.7
Rainfall (in)	0.01	0.01	0	0	0.0
Wind Speed (mph)	1-5	2-11	1-10	1-6	1-7
Date (1985)	11/3	11/4	11/5	11/6	11/7

	Tennessee River Mile						
	496	506	518	527	528	529	532
Travel Time	2.4 day	1.3 day	15.0 hr	2.0 hr.	1.3 hr.	0	-15 hr
Temp, °C	16.9	17.5	17.5	17.9	17.9	17.8	17.8
DO, mg/l	7.8	7.0	7.5	6.9	7.0	7.0	6.8
PH	8	7.8	8.1	7.1	7.0	7.0	6.9
Alkal, mg/l	58	58	58	61	62	63	62
Secchi Depth, m	2.00	2.00	1.75	--	1.25	1.25	1.25
Inorg N, mg/l	0.33	0.32	0.32	0.30	0.31	0.42	0.28
Org N, mg/l	0.18	0.13	0.12	0.10	0.17	0.15	0.15
Diss P, mg/l	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total P, mg/l	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Diss Org C, mg/l	2.6	2.6	2.6	2.7	2.8	2.5	2.9
Total Org C, mg/l	2.8	2.8	2.9	2.9	2.9	2.8	3.1
Chlorophyll *a*, ug/l	1.1	1.7	2.2	5.0	4.9	4.5	4.8

APPENDIX 4-A

ANALYTICAL METHODS FOR CHEMICAL PARAMETERS, PREOPERATIONAL WATER QUALITY MONITORING - WBN

Appendix 4-A. Analytical Methods for Chemical Parameters, Preoperational Water Quality Monitoring - Watts Bar Nuclear Plant

Parameter	STORET Code Number*	Method and Reference†	Preservation Techniques	Detection Limits
Alkalinity, total mg/L as $CaCO_3$	00410	Potentiometric Titration TVA NR OPS-FO-NRE-42.1	None (field titration)	1 mg/L
Carbon, total organic, mg/L	00680	Oxidation-Infrared TVA NRS-LB-AP-30.502.1	1+4 H_2SO_4, 4 deg C 1 mL/8 oz.	0.2 mg/L
Chloride, mg/L	00940	Auto Ferricyanide TVA NRS-LB-AP-30.320.1	4 deg C	1 mg/L
Conductance, specific umhos/cm at 25 deg C	00095	Wheatstone Bridge or Equivalent TVA NR OPS-FO-NRE-42.3	None (in situ)	10 umhos/cm
Copper, ug/L	01042	Atomic Absorption, Direct Method TVA NRS-LB-AP-30.223.1	1+1 HNO_3 2 mL/8 oz.	10 ug/L
Iron, total, ug/L	01045	Atomic Absorption, Direct Method TVA NRS-LB-AP-30.241.1	1+1 HNO_3 2 mL/8 oz.	50 ug/L
Manganese, total, ug/L	01055	Atomic Absorption TVA NRS-LB-AP-30.248.1	1+1 HNO_3 2 mL/8 oz.	10 ug/L
Nitrogen, ammonia, mg/L	00610	Auto Colorimetric Phenate TVA NRS-LB-AP-30.356.1	1+4 H_2SO_4, 4 deg C 1 mL/8 oz.	0.01 mg/L
Nitrogen, nitrate plus nitrate, mg/L	00630	Auto Cadmium Reduction TVA NRS-LB-AP-30.356.4	1+4 H_2SO_4, 4 deg C 1 mL/8 oz.	0.01 mg/L
Nitrogen, organic, mg/L	00605	Calculated from Kjeldahl nitrogen minus ammonia nitrogen TVA NRS-LB-AP-30.360.2	1+4 H_2SO_4, 4 deg C 1 mL/8 oz.	0.01 mg/L
Oxygen, dissolved, mg/L	00300	Electrode and/or Titrimetric TVA NR OPS-FO-NRE-42.4	In situ Determine immediately	0.01 mg/L
pH, standard units	00400	Electrometric TVA NR OPS-FO-NRE-42.8	In situ or Determine immediately	Not applicable
Phosphorus, dissolved, mg/L	00666	Colorimetric TVA NRS-LB-AP-30.360.2	1+4 H_2SO_4, 4 deg C 1 mL/8 oz.	0.01 mg/L

Appendix 4-A. (Continued)

Parameter	STORET Code Number*	Method and Reference+	Preservation Techniques	Detection Limits
Residue, total filterable (dissolved solids), mg/L	70300	Gravimetric TVA NRS-LB-AP-30.1.4.1	4 deg C	0.01 mg/L
Sodium, mg/L	00929	Atomic Absorption, Direct Method TVA NRS-LB-AP-30.279.1	4 deg C	0.1 mg/L
Sulfate, mg/L	00945	Turbidimetric TVA NRS-LB-AP-30.381.1	4 deg C	1 mg/L
Temperature, deg C	00010	Thermister, Thermometer	in situ	0.1 deg C
Zinc, ug/L	01092	Atomic Absorption, Direct Method TVA NRS-LB-AP-30.297.1	1+1 HNO_3 1 mL/8 oz.	10 ug/L

*STORET is tha acronym for Environmental Protection Agency's data storage and retrieval system in which all TVA water quality data are entered.

+Reference abbreviations refer to the following: TVA NRS - Laboratory Branch Quality Manual, 1980, Tennessee Valley Authority; TVA NR OPS - Field Operations NRE Procedures Manual, Volume 1, 1983, Tennessee Valley Authority.

APPENDIX 4-B

WATER QUALITY PARAMETERS BY STATION FOR EACH SAMPLING PERIOD, WBN PREOPERATIONAL MONITORING, 1973-1985

(Data entered on STORET; available upon request.)

APPENDIX 4-C

ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA BY STATION

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 496.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	130	17.114	6.596	1.500	27.000	90	16.552	7.204	3.000	26.800
Dissolved Oxygen (mg/L)	130	7.714	2.441	1.500	13.200	91	8.482	2.590	3.800	13.000
pH (standard units)	84	7.242	0.262	6.600	8.000	90	7.431	0.453	6.400	8.400
Conductivity (umhos/cm)	86	169.651	11.827	140.000	200.000	19	173.947	20.895	150.000	205.000
Alkalinity (mg/L)	31	50.581	7.136	35.000	68.000	64	58.719	6.945	44.000	81.000
Turbidity (mg/L)	0	.	.	.	.	36	11.139	15.038	2.400	55.000
Organic Nitrogen (mg/L)	28	0.145	0.248	0.040	1.400	64	0.179	0.092	0.030	0.410
Ammonia Nitrogen (mg/L)	28	0.086	0.095	0.020	0.430	64	0.047	0.014	0.020	0.080
Nitrite+Nitrate Nitrogen (mg/L)	28	0.339	0.063	0.230	0.470	64	0.286	0.091	0.130	0.440
Total Phosphorus (mg/L)	28	0.026	0.007	0.010	0.040	40	0.035	0.023	0.010	0.110
Dissolved Phosphorus (mg/L)	0	.	.	.	.	60	0.012	0.004	0.010	0.020
Total Organic Carbon (mg/L)	28	2.404	1.792	1.100	1.1000	64	2.777	1.104	1.300	7.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	36	2.189	0.976	1.000	4.600
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	2	565.000	176.777	440.000	690.000	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	1	100.000	.	100.000	100.000	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	2	5.000	0.000	5.000	5.000	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	2	15.000	7.071	10.000	20.000	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	2	50.000	0.000	50.000	50.000	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	2	15.000	7.071	10.000	20.000	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 506.6

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	101	16.830	7.008	2.500	29.000	171	17.062	0.111	2.700	27.400
Dissolved Oxygen (mg/L)	101	8.245	2.707	1.300	13.400	177	8.090	2.732	3.300	12.600
pH (standard units)	76	7.404	0.287	6.800	8.000	171	7.506	0.462	6.700	8.700
Conductivity (umhos/cm)	76	173.816	14.139	150.000	200.000	38	178.263	19.710	150.000	205.000
Alkalinity (mg/L)	25	53.360	5.537	47.000	69.000	64	61.703	7.391	45.000	76.000
Turbidity (mg/L)	0	.	.	.	.	36	5.753	3.190	1.600	13.000
Organic Nitrogen (mg/L)	25	0.108	0.025	0.060	0.150	65	0.188	0.136	0.010	0.680
Ammonia Nitrogen (mg/L)	25	0.070	0.053	0.010	0.280	65	0.048	0.021	0.010	0.140
Nitrite+Nitrate Nitrogen (mg/L)	25	0.370	0.088	0.250	0.550	65	0.309	0.090	0.130	0.460
Total Phosphorus (mg/L)	25	0.026	0.006	0.010	0.030	41	0.030	0.019	0.010	0.110
Dissolved Phosphorus (mg/L)	0	.	.	.	.	60	0.012	0.005	0.010	0.030
Total Organic Carbon (mg/L)	25	2.528	2.438	1.000	14.000	65	2.671	0.775	1.300	4.800
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	36	2.031	0.698	1.000	3.500
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 518.0

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	127	16.443	7.059	2.500	26.000	156	16.956	6.882	2.700	26.400
Dissolved Oxygen (mg/L)	127	8.017	2.738	2.100	13.200	162	7.985	2.571	3.200	12.400
pH (standard units)	91	7.422	0.242	7.200	8.000	155	7.506	0.432	6.800	8.500
Conductivity (umhos/cm)	91	175.714	13.511	150.000	200.000	32	179.031	19.010	160.000	205.000
Alkalinity (mg/L)	25	49.320	8.816	26.000	59.000	68	61.706	7.661	46.000	78.000
Turbidity (mg/L)	0	.	.	.	.	43	6.616	5.257	1.100	16.000
Organic Nitrogen (mg/L)	25	0.101	0.035	0.010	0.150	66	0.212	0.119	0.040	0.630
Ammonia Nitrogen (mg/L)	25	0.071	0.046	0.010	0.210	66	0.047	0.034	0.010	0.280
Nitrite+Nitrate Nitrogen (mg/L)	25	0.352	0.101	0.210	0.550	66	0.309	0.082	0.200	0.460
Total Phosphorus (mg/L)	25	0.026	0.007	0.020	0.040	42	0.028	0.013	0.010	0.060
Dissolved Phosphorus (mg/L)	0	.	.	.	.	59	0.013	0.005	0.010	0.030
Total Organic Carbon (mg/L)	25	1.904	0.292	1.000	2.400	66	2.639	0.889	1.200	5.800
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	34	2.141	0.698	1.100	3.500
BOD (mg/L)	0	.	.	.	.	15	1.307	0.440	1.000	2.500
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	17	21.012	3.471	11.000	24.800
Magnesium (mg/L)	0	.	.	.	.	17	5.065	1.084	2.300	6.500
Sodium (mg/L)	0	.	.	.	.	17	6.459	1.628	4.300	9.100
Potassium (mg/L)	0	.	.	.	.	17	1.465	0.203	1.000	1.900
Chloride (mg/L)	0	.	.	.	.	16	6.844	1.930	4.000	10.000
Sulfate (mg/L)	0	.	.	.	.	16	14.875	3.160	9.000	20.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	17	233.529	148.111	70.000	590.000
Dissolved Iron (ug/L)	0	.	.	.	.	16	16.250	17.464	10.000	70.000
Total Manganese (ug/L)	0	.	.	.	.	17	55.059	28.932	14.000	126.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	17	1.176	0.529	1.000	3.000
Barium (ug/L)	0	.	.	.	.	17	23.529	9.315	10.000	40.000
Beryllium (ug/L)	0	.	.	.	.	17	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	17	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	17	0.165	0.177	0.100	0.800
Chromium (ug/L)	0	.	.	.	.	17	1.588	0.795	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	17	11.118	11.039	5.000	50.000
Lead (ug/L)	0	.	.	.	.	17	3.471	4.611	1.000	20.000
Nickel (ug/L)	0	.	.	.	.	17	2.059	1.600	1.000	6.000
Silver (ug/L)	0	.	.	.	.	17	4.812	5.042	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	17	10.412	9.461	1.000	36.000
Aluminum (ug/L)	0	.	.	.	.	17	174.706	122.532	50.000	410.000
Selenium (ug/L)	0	.	.	.	.	17	1.176	0.728	1.000	4.000
Mercury (ug/L)	0	.	.	.	.	17	0.200	0.000	0.200	0.200

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 527.4

	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	130	16.407	7.054	2.500	26.500	178	16.421	7.304	3.000	26.400
Dissolved Oxygen (mg/L)	130	8.103	2.790	1.700	13.600	177	7.830	2.462	2.900	12.400
pH (standard units)	117	7.336	0.301	6.200	8.000	174	7.470	0.326	6.700	9.000
Conductivity (umhos/cm)	126	169.841	16.394	140.000	200.000	34	180.412	17.823	159.000	205.000
Alkalinity (mg/L)	72	54.069	5.747	39.000	63.000	92	60.533	7.970	46.000	73.000
Turbidity (mg/L)	70	8.043	4.388	2.200	20.000	67	5.666	2.502	1.100	12.000
Organic Nitrogen (mg/L)	81	0.135	0.059	0.040	0.380	97	0.194	0.107	0.040	0.620
Ammonia Nitrogen (mg/L)	81	0.061	0.052	0.010	0.410	97	0.041	0.026	0.010	0.210
Nitrite+Nitrate Nitrogen (mg/L)	81	0.433	0.386	0.180	3.500	97	0.358	0.359	0.020	3.500
Total Phosphorus (mg/L)	81	0.026	0.009	0.010	0.050	62	0.027	0.013	0.010	0.050
Dissolved Phosphorus (mg/L)	72	0.020	0.047	0.010	0.410	92	0.011	0.004	0.010	0.030
Total Organic Carbon (mg/L)	73	2.356	0.776	1.000	5.400	97	2.725	1.494	1.200	15.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	53	1.860	0.807	0.800	3.500
BOD (mg/L)	71	1.221	0.332	1.000	2.500	64	1.397	0.384	1.000	2.500
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	70	19.329	2.535	13.000	23.000	64	22.445	3.954	16.000	38.000
Magnesium (mg/L)	70	4.631	0.499	3.600	5.800	64	5.221	0.839	3.700	8.400
Sodium (mg/L)	70	5.331	1.370	1.600	9.000	64	6.142	1.620	3.800	9.100
Potassium (mg/L)	70	1.357	0.229	1.000	2.100	64	1.444	0.187	1.000	1.900
Chloride (mg/L)	71	6.169	1.464	4.000	9.000	62	6.498	1.929	3.000	10.000
Sulfate (mg/L)	67	13.433	3.026	8.000	20.000	60	13.567	2.831	9.000	20.000
Silicon (mg/L)	28	5.346	1.019	4.100	7.500	0	.	.	.	.
Fluoride (mg/L)	34	0.081	0.017	0.050	0.100	0	.	.	.	.
Total Iron (ug/L)	70	490.143	495.143	120.000	4200.000	65	194.000	125.310	10.000	610.000
Dissolved Iron (ug/L)	72	68.056	41.745	30.000	230.000	62	28.548	20.633	10.000	70.000
Total Manganese (ug/L)	70	65.714	33.257	30.000	180.000	61	62.984	25.010	30.000	126.000
Dissolved Manganese (ug/L)	72	17.917	15.099	10.000	70.000	0	.	.	.	.
Arsenic (ug/L)	72	4.736	1.957	2.000	11.000	65	1.323	0.664	1.000	3.000
Barium (ug/L)	70	102.857	16.780	100.000	200.000	65	40.154	30.026	10.000	100.000
Beryllium (ug/L)	70	10.000	0.000	10.000	10.000	65	2.692	3.513	1.000	10.000
Boron (ug/L)	59	88.983	56.162	10.000	280.000	65	44.338	18.279	6.000	130.000
Cadmium (ug/L)	69	1.043	0.205	1.000	2.000	65	0.295	0.503	0.100	2.400
Chromium (ug/L)	70	5.286	1.405	5.000	14.000	65	1.523	0.986	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	70	46.143	112.576	10.000	680.000	65	13.231	14.958	5.000	90.000
Lead (ug/L)	70	12.057	9.704	10.000	80.000	61	4.426	6.206	1.000	40.000
Nickel (ug/L)	70	83.429	174.105	50.000	1200.000	65	2.046	1.948	1.000	10.000
Silver (ug/L)	70	10.000	0.000	10.000	10.000	65	7.588	4.254	0.200	10.000
Zinc (ug/L)	70	48.714	191.697	10.000	1600.000	65	20.723	47.684	5.000	330.000
Aluminum (ug/L)	70	623.429	402.614	200.000	2300.000	65	135.846	76.524	50.000	370.000
Selenium (ug/L)	72	1.653	1.189	1.000	10.000	65	1.154	0.441	1.000	3.000
Mercury (ug/L)	72	0.260	0.258	0.200	1.600	65	0.202	0.012	0.200	0.300

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 528.0

Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
Temperature (deg C)	42	16.990	7.388	2.500	26.400	91	16.001	7.500	3.000	26.200
Dissolved Oxygen (mg/L)	42	7.395	3.204	1.700	13.500	91	8.018	2.516	3.440	12.410
pH (standard units)	42	7.374	0.294	7.000	8.000	85	7.468	0.323	6.800	8.390
Conductivity (umhos/cm)	42	174.048	14.989	150.000	200.000	17	182.412	18.090	162.000	205.000
Alkalinity (mg/L)	22	52.727	4.495	46.000	60.000	63	61.000	7.945	47.000	74.000
Turbidity (mg/L)	0	.	.	.	.	42	5.879	2.758	1.700	13.000
Organic Nitrogen (mg/L)	22	0.132	0.114	0.050	0.600	64	0.212	0.112	0.040	0.580
Ammonia Nitrogen (mg/L)	22	0.056	0.043	0.010	0.200	64	0.042	0.034	0.010	0.210
Nitrite+Nitrate Nitrogen (mg/L)	22	0.324	0.072	0.230	0.450	64	0.318	0.117	0.180	0.930
Total Phosphorus (mg/L)	22	0.022	0.006	0.010	0.030	40	0.029	0.015	0.010	0.060
Dissolved Phosphorus (mg/L)	0	.	.	.	.	60	0.011	0.004	0.010	0.030
Total Organic Carbon (mg/L)	22	2.036	0.382	1.400	2.900	64	2.669	0.953	1.300	6.400
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	36	1.931	0.808	0.800	3.300
BOD (mg/L)	0	.	.	.	.	16	1.375	0.543	1.000	3.200
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	17	22.371	4.958	17.000	39.000
Magnesium (mg/L)	0	.	.	.	.	17	5.289	1.033	3.900	7.700
Sodium (mg/L)	0	.	.	.	.	17	6.512	1.721	4.300	9.200
Potassium (mg/L)	0	.	.	.	.	17	1.462	0.232	0.960	1.800
Chloride (mg/L)	0	.	.	.	.	16	6.956	2.021	4.000	10.000
Sulfate (mg/L)	0	.	.	.	.	16	14.438	3.032	10.000	21.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	17	251.765	234.926	10.000	960.000
Dissolved Iron (ug/L)	0	.	.	.	.	16	21.875	24.554	10.000	90.000
Total Manganese (ug/L)	0	.	.	.	.	17	58.941	26.231	30.000	122.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	17	1.353	0.862	1.000	4.000
Barium (ug/L)	0	.	.	.	.	17	25.882	11.757	10.000	40.000
Beryllium (ug/L)	0	.	.	.	.	17	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	17	67.647	62.902	50.000	310.000
Cadmium (ug/L)	0	.	.	.	.	17	0.176	0.182	0.100	0.800
Chromium (ug/L)	0	.	.	.	.	17	1.765	1.393	1.000	5.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	17	14.059	18.593	5.000	84.000
Lead (ug/L)	0	.	.	.	.	17	1.882	1.495	1.000	6.000
Nickel (ug/L)	0	.	.	.	.	17	1.647	0.931	1.000	4.000
Silver (ug/L)	0	.	.	.	.	17	5.388	5.042	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	17	19.882	41.960	5.000	180.000
Aluminum (ug/L)	0	.	.	.	.	17	152.941	81.912	50.000	320.000
Selenium (ug/L)	0	.	.	.	.	17	1.059	0.243	1.000	2.000
Mercury (ug/L)	0	.	.	.	.	17	0.200	0.000	0.200	0.200

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 529.5

	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	42	15.014	7.511	2.500	27.000	135	15.769	7.601	3.000	27.100
Dissolved Oxygen (mg/L)	42	7.912	3.337	1.600	13.500	135	8.094	2.755	2.600	13.800
pH (standard units)	42	7.388	0.265	7.000	8.000	135	7.518	0.382	6.900	9.100
Conductivity (umhos/cm)	42	174.048	14.324	150.000	200.000	16	180.625	17.335	162.000	205.000
Alkalinity (mg/L)	22	53.773	4.151	47.000	64.000	77	61.208	8.315	46.000	76.000
Turbidity (mg/L)	0	.	.	.	.	63	5.803	2.946	1.200	14.000
Organic Nitrogen (mg/L)	22	0.112	0.045	0.050	0.280	86	0.189	0.099	0.010	0.480
Ammonia Nitrogen (mg/L)	22	0.063	0.026	0.010	0.110	86	0.037	0.021	0.010	0.130
Nitrite+Nitrate Nitrogen (mg/L)	22	0.357	0.105	0.230	0.570	86	0.322	0.113	0.020	0.850
Total Phosphorus (mg/L)	22	0.024	0.008	0.010	0.040	62	0.027	0.012	0.010	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	77	0.012	0.004	0.010	0.030
Total Organic Carbon (mg/L)	22	2.032	0.344	1.600	2.900	85	2.626	1.096	1.300	10.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	55	1.907	0.732	0.600	3.100
BOD (mg/L)	0	.	.	.	.	37	1.389	0.436	1.000	2.700
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	40	22.767	5.619	17.000	40.000
Magnesium (mg/L)	0	.	.	.	.	40	5.400	1.295	3.900	8.700
Sodium (mg/L)	0	.	.	.	.	40	6.322	1.771	4.200	9.300
Potassium (mg/L)	0	.	.	.	.	40	1.449	0.216	0.970	1.800
Chloride (mg/L)	0	.	.	.	.	37	6.719	2.015	4.000	10.000
Sulfate (mg/L)	0	.	.	.	.	37	13.946	2.798	9.000	20.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	40	230.500	174.385	10.000	700.000
Dissolved Iron (ug/L)	0	.	.	.	.	37	14.865	14.068	10.000	80.000
Total Manganese (ug/L)	0	.	.	.	.	40	58.950	24.863	30.000	133.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	40	1.275	0.599	1.000	3.000
Barium (ug/L)	0	.	.	.	.	40	25.500	13.388	10.000	60.000
Beryllium (ug/L)	0	.	.	.	.	40	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	40	78.000	144.439	50.000	940.000
Cadmium (ug/L)	0	.	.	.	.	40	0.147	0.101	0.100	0.500
Chromium (ug/L)	0	.	.	.	.	40	1.875	1.911	1.000	12.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	40	11.625	11.729	5.000	59.000
Lead (ug/L)	0	.	.	.	.	40	2.125	2.483	1.000	14.000
Nickel (ug/L)	0	.	.	.	.	40	1.775	1.702	1.000	9.000
Silver (ug/L)	0	.	.	.	.	40	5.835	4.906	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	40	17.525	33.807	2.000	220.000
Aluminum (ug/L)	0	.	.	.	.	40	154.750	89.671	50.000	330.000
Selenium (ug/L)	0	.	.	.	.	40	1.300	0.911	1.000	6.000
Mercury (ug/L)	0	.	.	.	.	40	0.202	0.016	0.200	0.300

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 529.9

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	280	16.923	6.917	2.000	27.500	177	17.713	6.895	3.000	26.600
Dissolved Oxygen (mg/L)	275	7.832	2.277	2.400	17.300	181	6.761	2.489	2.100	13.200
pH (standard units)	61	7.375	0.402	6.300	8.900	20	7.525	0.258	7.100	8.360
Conductivity (umhos/cm)	62	161.565	33.928	97.000	320.000	1	167.000	.	167.000	167.000
Alkalinity (mg/L)	63	52.952	9.764	4.000	82.000	7	62.143	7.690	49.000	74.000
Turbidity (mg/L)	89	9.898	8.328	1.000	40.000	8	6.537	3.812	2.100	13.000
Organic Nitrogen (mg/L)	66	0.161	0.085	0.040	0.450	9	0.187	0.083	0.030	0.340
Ammonia Nitrogen (mg/L)	66	0.060	0.038	0.010	0.230	9	0.034	0.020	0.020	0.080
Nitrite+Nitrate Nitrogen (mg/L)	64	0.362	0.121	0.110	0.790	9	0.306	0.091	0.160	0.460
Total Phosphorus (mg/L)	66	0.026	0.010	0.010	0.050	9	0.026	0.010	0.010	0.040
Dissolved Phosphorus (mg/L)	37	0.018	0.021	0.010	0.130	8	0.011	0.004	0.010	0.020
Total Organic Carbon (mg/L)	35	2.260	0.671	1.200	4.700	9	2.478	0.694	1.500	3.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.025	0.835	0.900	3.100
BOD (mg/L)	39	1.492	0.872	1.000	5.800	1	1.300	.	1.300	1.300
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	2	95.000	7.071	90.000	100.000	0	.	.	.	.
Calcium (mg/L)	61	18.951	3.030	8.000	24.000	1	22.000	.	22.000	22.000
Magnesium (mg/L)	61	4.554	0.598	2.700	5.600	1	5.500	.	5.500	5.500
Sodium (mg/L)	62	6.031	5.838	2.300	50.000	1	4.100	.	4.100	4.100
Potassium (mg/L)	62	1.389	0.276	0.900	2.200	1	1.400	.	1.400	1.400
Chloride (mg/L)	63	6.905	3.971	4.000	35.000	1	5.000	.	5.000	5.000
Sulfate (mg/L)	63	12.984	2.860	3.000	20.000	0	.	.	.	.
Silicon (mg/L)	25	5.352	0.825	4.100	7.200	0	.	.	.	.
Fluoride (mg/L)	59	0.087	0.019	0.040	0.100	0	.	.	.	.
Total Iron (ug/L)	65	462.462	342.222	120.000	2500.000	1	130.000	.	130.000	130.000
Dissolved Iron (ug/L)	38	65.789	33.982	10.000	170.000	1	50.000	.	50.000	50.000
Total Manganese (ug/L)	65	64.923	34.826	20.000	160.000	0	.	.	.	.
Dissolved Manganese (ug/L)	38	22.895	20.913	10.000	90.000	0	.	.	.	.
Arsenic (ug/L)	38	4.474	1.871	2.000	10.000	1	1.000	.	1.000	1.000
Barium (ug/L)	37	100.000	0.000	100.000	100.000	1	100.000	.	100.000	100.000
Beryllium (ug/L)	36	10.000	0.000	10.000	10.000	1	10.000	.	10.000	10.000
Boron (ug/L)	34	205.882	298.797	20.000	1000.000	1	8.000	.	8.000	8.000
Cadmium (ug/L)	37	1.946	2.248	1.000	13.000	1	0.100	.	0.100	0.100
Chromium (UG/)	37	5.919	5.590	5.000	39.000	1	2.000	.	2.000	2.000
Cobalt (ug/l)	4	5.000	0.000	5.000	5.000	0	.	.	.	.
Copper (ug/L)	37	26.216	33.363	10.000	190.000	1	40.000	.	40.000	40.000
Lead (ug/L)	37	15.324	20.927	10.000	130.000	0	.	.	.	.
Nickel (ug/L	37	61.081	45.934	50.000	290.000	1	1.000	.	1.000	1.000
Silver (ug/L)	37	10.000	0.000	10.000	10.000	1	10.000	.	10.000	10.000
Zinc (ug/L)	37	21.081	27.262	10.000	170.000	1	10.000	.	10.000	10.000
Aluminum (ug/L)	37	578.378	376.021	200.000	1800.000	1	100.000	.	100.000	100.000
SELENIUM (ug/L)	38	1.579	0.642	1.000	4.000	1	1.000	.	1.000	1.000
Mercury (ug/L)	38	0.239	0.160	0.200	1.000	1	0.200	.	0.200	0.200

APPENDIX 4-C. ALL-SEASON SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - TRM 532.1

	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	196	16.921	7.301	2.500	27.800	315	17.559	7.640	2.800	29.100
Dissolved Oxygen (mg/L)	200	7.751	3.163	1.000	13.100	315	8.097	3.103	0.200	12.600
pH (standard units)	143	7.566	0.413	6.800	8.500	315	7.757	0.800	3.000	10.600
Conductivity (umhos/cm)	143	173.497	13.700	130.000	200.000	64	175.547	14.798	147.000	200.000
Alkalinity (mg/L)	25	54.080	4.672	46.000	66.000	60	61.300	7.973	47.000	74.000
Turbidity (mg/L)	0	.	.	.	.	35	5.100	3.480	1.400	14.000
Organic Nitrogen (mg/L)	25	0.127	0.033	0.070	0.210	63	0.275	0.126	0.110	0.650
Ammonia Nitrogen (mg/L)	25	0.048	0.048	0.010	0.210	63	0.027	0.021	0.010	0.140
Nitrite+Nitrate Nitrogen (mg/L)	25	0.320	0.134	0.130	0.550	63	0.242	0.153	0.010	0.480
Total Phosphorus (mg/L)	25	0.026	0.010	0.010	0.050	39	0.032	0.015	0.010	0.080
Dissolved Phosphorus (mg/L)	0	.	.	.	.	59	0.013	0.008	0.010	0.070
Total Organic Carbon (mg/L)	25	2.104	0.338	1.600	3.100	63	2.816	0.835	1.300	5.300
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	35	2.011	0.845	0.900	3.400
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D

SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 496.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	24	6.271	2.701	1.500	8.600	21	5.948	1.916	3.000	7.700
Dissolved Oxygen (mg/L)	24	11.108	2.285	4.600	13.200	22	11.623	1.215	9.400	13.000
pH (standard units)	18	7.406	0.503	6.600	8.000	22	7.523	0.519	6.400	8.100
Conductivity (umhos/cm)	18	181.667	10.432	170.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	5	55.200	7.155	50.000	64.000	16	55.688	8.739	44.000	68.000
Turbidity (mg/L)	0	.	.	.	.	12	22.875	21.963	6.400	55.000
Organic Nitrogen (mg/L)	3	0.080	0.000	0.080	0.080	16	0.214	0.121	0.040	0.410
Ammonia Nitrogen (mg/L)	3	0.027	0.012	0.020	0.040	16	0.039	0.014	0.020	0.060
Nitrite+Nitrate Nitrogen (mg/L)	3	0.467	0.006	0.460	0.470	16	0.411	0.023	0.380	0.440
Total Phosphorus (mg/L)	3	0.027	0.006	0.020	0.030	12	0.053	0.031	0.030	0.110
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.015	0.005	0.010	0.020
Total Organic Carbon (mg/L)	3	2.600	1.127	1.900	3.900	16	3.169	1.839	1.300	7.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	2.392	1.499	1.000	4.600
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 496.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	25	18.416	1.424	17.200	21.200	24	18.933	1.688	16.100	23.600
Dissolved Oxygen (mg/L)	25	7.696	0.814	6.300	9.000	24	8.700	1.561	4.800	10.400
pH (standard units)	19	7.158	0.061	7.000	7.200	24	7.487	0.471	6.900	8.300
Conductivity (umhos/cm)	19	155.263	7.723	140.000	160.000	7	155.000	5.000	150.000	160.000
Alkalinity (mg/L)	6	52.667	11.396	41.000	68.000	16	54.813	5.764	45.000	65.000
Turbidity (mg/L)	0	.	.	.	.	8	6.462	1.464	4.300	8.500
Organic Nitrogen (mg/L)	6	0.088	0.040	0.040	0.140	16	0.155	0.076	0.030	0.250
Ammonia Nitrogen (mg/L)	6	0.077	0.014	0.060	0.100	16	0.046	0.020	0.020	0.070
Nitrite+Nitrate Nitrogen (mg/L)	6	0.318	0.083	0.230	0.400	16	0.240	0.102	0.130	0.400
Total Phosphorus (mg/L)	6	0.025	0.005	0.020	0.030	12	0.027	0.012	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	12	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	6	1.950	0.622	1.200	2.700	16	2.637	0.856	1.900	5.200
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.175	0.417	1.800	2.700
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 496.5

	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	39	24.733	1.168	22.500	27.000	22	25.705	0.463	25.100	26.800
Dissolved Oxygen (mg/L)	39	5.362	1.709	1.500	8.800	22	5.109	0.589	3.800	5.700
pH (standard units)	22	7.127	0.094	7.000	7.400	22	7.141	0.274	6.700	7.900
Conductivity (umhos/cm)	22	173.182	9.455	160.000	180.000	6	168.333	3.559	163.000	172.000
Alkalinity (mg/L)	11	49.182	6.416	35.000	60.000	16	63.563	5.176	58.000	81.000
Turbidity (mg/L)	0	.	.	.	.	8	4.275	1.200	3.200	6.600
Organic Nitrogen (mg/L)	10	0.249	0.405	0.090	1.400	16	0.189	0.083	0.050	0.400
Ammonia Nitrogen (mg/L)	10	0.090	0.120	0.040	0.430	16	0.051	0.011	0.040	0.080
Nitrite+Nitrate Nitrogen (mg/L)	10	0.311	0.024	0.290	0.350	16	0.234	0.021	0.200	0.280
Total Phosphorus (mg/L)	10	0.024	0.010	0.010	0.040	8	0.019	0.010	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	10	3.000	2.859	1.400	11.000	16	2.900	0.588	1.900	3.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.212	0.589	1.500	3.000
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	1	690.000	.	690.000	690.000	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	1	100.000	.	100.000	100.000	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	1	5.000	.	5.000	5.000	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	1	10.000	.	10.000	10.000	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	1	50.000	.	50.000	50.000	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	1	10.000	.	10.000	10.000	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 496.5

	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	42	15.460	1.575	13.600	18.100	23	14.996	1.715	9.000	16.900
Dissolved Oxygen (mg/L)	42	7.969	0.811	6.600	9.200	23	8.478	1.364	6.900	11.600
pH (standard units)	25	7.288	0.083	7.100	7.400	22	7.568	0.404	7.100	8.400
Conductivity (umhos/cm)	27	168.889	3.203	160.000	170.000	6	201.667	8.165	185.000	205.000
Alkalinity (mg/L)	9	48.333	2.784	46.000	53.000	16	60.813	3.229	57.000	66.000
Turbidity (mg/L)	0	.	.	.	.	8	5.075	3.479	2.400	12.000
Organic Nitrogen (mg/L)	9	0.088	0.023	0.060	0.120	16	0.159	0.074	0.070	0.570
Ammonia Nitrogen (mg/L)	9	0.109	0.108	0.050	0.350	16	0.050	0.005	0.040	0.060
Nitrite+Nitrate Nitrogen (mg/L)	9	0.341	0.034	0.290	0.370	16	0.260	0.030	0.210	0.290
Total Phosphorus (mg/L)	9	0.029	0.003	0.020	0.030	8	0.039	0.008	0.030	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.013	0.005	0.010	0.020
Total Organic Carbon (mg/L)	9	1.978	0.517	1.100	2.700	16	2.400	0.551	1.500	3.200
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	1.875	0.725	1.100	2.600
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	1	440.000	.	440.000	440.000	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	1	5.000	.	5.000	5.000	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	1	20.000	.	20.000	20.000	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	1	50.000	.	50.000	50.000	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	1	20.000	.	20.000	20.000	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 506.6

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	19	5.500	2.455	2.500	10.000	35	5.497	1.762	2.700	7.400
Dissolved Oxygen (mg/L)	19	12.484	0.647	11.000	13.400	41	11.729	0.772	9.900	12.600
pH (standard units)	16	7.687	0.348	6.800	8.000	35	7.691	0.378	7.000	8.300
Conductivity (umhos/cm)	16	190.000	10.328	180.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	6	57.667	2.58	55.000	61.000	16	57.688	9.898	45.000	76.000
Turbidity (mg/L)	0	.	.	.	.	12	8.992	3.091	4.700	13.000
Organic Nitrogen (mg/L)	6	0.120	0.017	0.090	0.140	17	0.171	0.124	0.010	0.520
Ammonia Nitrogen (mg/L)	6	0.050	0.032	0.010	0.080	17	0.034	0.017	0.010	0.080
Nitrite+Nitrate Nitrogen (mg/L)	6	0.497	0.051	0.450	0.550	17	0.422	0.046	0.330	0.460
Total Phosphorus (mg/L)	6	0.025	0.005	0.020	0.030	13	0.039	0.023	0.020	0.110
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.013	0.005	0.010	0.020
Total Organic Carbon (mg/L)	6	2.067	0.635	1.600	3.300	17	2.565	0.794	1.300	4.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	1.975	0.917	1.000	3.500
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 506.6

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	25	17.848	1.250	16.800	21.500	47	18.479	1.735	16.400	23.200
Dissolved Oxygen (mg/L)	25	7.780	0.795	6.000	9.100	47	8.736	1.510	4.800	12.100
pH (standard units)	22	7.309	0.209	7.200	7.800	47	7.526	0.486	6.800	8.600
Conductivity (umhos/cm)	22	159.545	5.755	150.000	170.000	14	158.571	3.631	150.000	160.000
Alkalinity (mg/L)	6	53.667	9.201	47.000	69.000	16	58.938	6.678	48.000	67.000
Turbidity (mg/L)	0	.	.	.	.	8	4.587	0.803	3.200	5.800
Organic Nitrogen (Mg/L)	6	0.108	0.017	0.080	0.130	16	0.238	0.211	0.020	0.680
Ammonia Nitrogen (mg/L)	6	0.077	0.019	0.060	0.100	16	0.060	0.032	0.010	0.140
Nitrite+Nitrate Nitrogen (mg/L)	6	0.347	0.074	0.250	0.410	16	0.279	0.105	0.130	0.440
Total Phosphorus (mg/L)	6	0.030	0.000	0.030	0.030	12	0.024	0.017	0.010	0.060
Dissolved Phosphorus (mg/L)	0	.	.	.	.	12	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	6	1.917	0.147	1.800	2.200	16	2.619	0.817	1.800	4.800
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.000	0.378	1.600	2.600
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 506.6

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	26	25.758	1.124	24.000	29.000	45	25.804	0.554	25.000	27.400
Dissolved Oxygen (mg/L)	26	5.442	2.035	1.300	9.000	45	4.556	0.720	3.300	5.600
pH (standard units)	17	7.312	0.283	7.100	8.000	45	7.267	0.428	6.700	8.300
Conductivity (umhos/cm)	17	175.294	14.628	160.000	200.000	12	174.500	1.508	173.000	177.000
Alkalinity (mg/L)	7	51.429	3.952	47.000	58.000	16	66.688	3.772	60.000	72.000
Turbidity (mg/L)	0	.	.	.	.	8	3.950	1.401	1.800	6.700
Organic Nitrogen (mg/L)	7	0.119	0.026	0.080	0.150	16	0.195	0.104	0.100	0.450
Ammonia Nitrogen (mg/L)	7	0.047	0.008	0.040	0.060	16	0.051	0.006	0.040	0.070
Nitrite+Nitrate Nitrogen (mg/L)	7	0.300	0.017	0.270	0.320	16	0.257	0.020	0.220	0.280
Total Phosphorus (mg/L)	7	0.020	0.006	0.010	0.030	8	0.024	0.015	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.011	0.003	0.010	0.020
Total Organic Carbon (MG/)	7	3.529	4.635	1.000	14.000	16	3.069	0.775	2.000	4.700
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.300	0.581	1.600	2.900
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 506.6

Parameter	1975-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	31	15.465	2.147	11.700	18.100	44	15.807	1.125	14.300	17.600
Dissolved Oxygen (mg/L)	31	8.371	1.352	6.500	11.300	44	7.623	0.809	6.700	9.600
pH (standard units)	21	7.362	0.156	7.200	7.700	44	7.582	0.443	7.100	8.700
Conductivity (umhos/cm)	21	175.238	5.118	170.000	180.000	12	205.000	0.000	205.000	205.000
Alkalinity (mg/L)	6	51.000	1.549	49.000	53.000	16	63.500	4.163	58.000	69.000
Turbidity (mg/L)	0	.	.	.	.	8	3.862	2.436	1.600	9.000
Organic Nitrogen (mg/L)	6	0.082	0.020	0.060	0.120	16	0.151	0.051	0.060	0.240
Ammonia Nitrogen (mg/L)	6	0.112	0.093	0.030	0.280	16	0.049	0.013	0.040	0.090
Nitrite+Nitrate Nitrogen (mg/L)	6	0.347	0.037	0.310	0.380	16	0.269	0.031	0.230	0.310
Total Phosphorus (mg/L)	6	0.030	0.000	0.030	0.030	8	0.032	0.010	0.020	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.015	0.006	0.010	0.030
Total Organic Carbon (mg/L)	6	2.433	0.463	1.900	3.100	16	2.437	0.616	1.400	3.300
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	1.875	0.719	1.200	2.800
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 510.0

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	27	5.281	2.356	2.500	8.300	32	5.681	1.626	2.700	6.800
Dissolved Oxygen (mg/L)	27	12.407	0.743	11.000	13.200	38	11.378	0.787	9.500	12.400
pH (standard units)	19	7.689	0.221	7.400	8.000	31	7.784	0.293	7.300	8.500
Conductivity (umhos/cm)	19	187.895	8.550	180.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	6	55.667	2.805	51.000	59.000	18	59.278	11.333	46.000	78.000
Turbidity (mg/L)	0	.	.	.	.	15	9.700	3.018	6.300	16.000
Organic Nitrogen (mg/L)	6	0.098	0.047	0.010	0.140	17	0.202	0.089	0.040	0.390
Ammonia Nitrogen (mg/L)	6	0.070	0.037	0.010	0.120	17	0.029	0.016	0.010	0.060
Nitrite+Nitrate Nitrogen (mg/L)	6	0.497	0.048	0.450	0.550	17	0.415	0.051	0.330	0.460
Total Phosphorus (mg/L)	6	0.030	0.011	0.020	0.040	13	0.038	0.009	0.030	0.060
Dissolved Phosphorus (mg/L)	0	.	.	.	.	14	0.014	0.005	0.010	0.020
Total Organic Carbon (mg/L)	6	1.833	0.327	1.500	2.400	17	2.653	0.975	1.200	4.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	9	2.611	0.785	1.700	3.500
BOD (mg/L)	0	.	.	.	.	4	1.500	0.356	1.200	2.000
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	6	21.900	2.905	18.000	24.500
Magnesium (mg/L)	0	.	.	.	.	6	5.485	1.028	4.200	6.500
Sodium (mg/L)	0	.	.	.	.	6	6.867	1.624	4.300	8.200
Potassium (mg/L)	0	.	.	.	.	6	1.433	0.234	1.000	1.600
Chloride (mg/L)	0	.	.	.	.	6	7.333	1.506	6.000	9.000
Sulfate (mg/L)	0	.	.	.	.	6	17.167	2.483	14.000	20.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	6	348.333	197.830	160.000	590.000
Dissolved Iron (ug/L)	0	.	.	.	.	5	30.000	28.284	10.000	70.000
Total Manganese (ug/L)	0	.	.	.	.	6	41.667	8.359	30.000	56.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	6	1.333	0.816	1.000	3.000
Barium (ug/L)	0	.	.	.	.	6	20.000	10.954	10.000	30.000
Beryllium (ug/L)	0	.	.	.	.	6	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	6	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	6	0.217	0.286	0.100	0.800
Chromium (ug/L)	0	.	.	.	.	6	1.167	0.408	1.000	2.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	6	9.167	5.845	5.000	20.000
Lead (ug/L)	0	.	.	.	.	6	5.500	7.342	1.000	20.000
Nickel (ug/L)	0	.	.	.	.	6	2.000	2.000	1.000	6.000
Silver (ug/L)	0	.	.	.	.	6	5.100	5.368	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	6	9.000	6.197	1.000	19.000
Aluminum (ug/L)	0	.	.	.	.	6	316.667	79.415	220.000	410.000
Selenium (ug/L)	0	.	.	.	.	6	1.500	1.225	1.000	4.000
Mercury (ug/L)	0	.	.	.	.	6	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 518.0

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	30	17.793	1.151	16.800	20.800	43	8.291	1.269	16.100	20.600
Dissolved Oxygen (mg/L)	30	7.610	0.724	6.000	8.600	43	8.279	1.517	4.700	10.300
pH (standard units)	26	7.315	0.097	7.200	7.400	43	7.428	0.393	7.000	8.100
Conductivity (umhos/cm)	26	160.385	4.455	150.000	170.000	12	160.000	0.000	160.000	160.000
Alkalinity (mg/L)	6	38.333	11.605	26.000	51.000	17	59.176	6.517	50.000	68.000
Turbidity (mg/L)	0	.	.	.	.	10	5.370	2.101	3.100	8.600
Organic Nitrogen (mg/L)	6	0.102	0.031	0.060	0.150	17	0.241	0.184	0.050	0.630
Ammonia Nitrogen (mg/L)	6	0.063	0.012	0.050	0.080	17	0.073	0.055	0.030	0.280
Nitrite+Nitrate Nitrogen (mg/L)	6	0.312	0.097	0.210	0.400	17	0.295	0.078	0.200	0.420
Total Phosphorus (mg/L)	6	0.023	0.005	0.020	0.030	13	0.020	0.014	0.010	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	13	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	6	1.900	0.126	1.800	2.100	17	2.412	0.881	1.300	5.300
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	9	1.767	0.371	1.100	2.300
BOD (mg/L)	0	.	.	.	.	5	1.460	0.631	1.000	2.500
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	5	19.000	4.637	11.000	22.000
Magnesium (mg/L)	0	.	.	.	.	5	4.340	1.201	2.300	5.100
Sodium (mg/L)	0	.	.	.	.	5	5.420	0.939	4.400	6.300
Potassium (mg/L)	0	.	.	.	.	5	1.340	0.055	1.300	1.400
Chloride (mg/L)	0	.	.	.	.	4	5.625	0.750	4.500	6.000
Sulfate (mg/L)	0	.	.	.	.	4	14.500	1.915	12.000	16.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	5	136.000	50.794	70.000	200.000
Dissolved Iron (ug/L)	0	.	.	.	.	5	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	5	33.600	19.680	14.000	59.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	5	1.000	0.000	1.000	1.000
Barium (ug/L)	0	.	.	.	.	5	22.000	4.472	20.000	30.000
Beryllium (ug/L)	0	.	.	.	.	5	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	5	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	5	0.100	0.000	0.100	0.100
Chromium (ug/L)	0	.	.	.	.	5	1.800	0.447	1.000	2.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	5	7.000	3.464	5.000	13.000
Lead (ug/L)	0	.	.	.	.	5	2.800	1.643	1.000	5.000
Nickel (ug/L)	0	.	.	.	.	5	1.800	1.095	1.000	3.000
Silver (ug/L)	0	.	.	.	.	5	4.120	5.368	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	5	10.000	10.630	5.000	29.000
Aluminum (ug/L)	0	.	.	.	.	5	82.000	25.884	50.000	110.000
Selenium (ug/L)	0	.	.	.	.	5	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	5	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 518.0

Parameter	1973-1977 Preoperational Period N	Mean	SD	Min	Max	1982-1986 Preoperatioal Period N	Mean	SD	Min	Max
Temperature (deg C)	33	25.233	0.444	24.500	26.000	41	25.427	0.468	24.900	26.400
Dissolved Oxygen (mg/L)	33	4.836	1.020	2.100	6.900	41	4.707	0.827	3.200	5.900
pH (standard units)	21	7.433	0.314	7.200	8.000	41	7.268	0.360	6.800	8.400
Conductivity (umhos/cm)	21	180.952	15.134	160.000	200.000	10	175.900	1.287	174.000	177.000
Alkalinity (mg/L)	7	52.429	4.198	48.000	59.000	17	65.765	4.684	57.000	73.000
Turbidity (mg/L)	0	.	.	.	.	10	5.530	0.946	4.600	7.600
Organic Nitrogen (mg/L)	7	0.121	0.024	0.100	0.150	16	0.231	0.101	0.120	0.490
Ammonia Nitrogen (mg/L)	7	0.056	0.021	0.040	0.100	16	0.041	0.011	0.020	0.060
Nitrite+Nitrate Nitrogen (mg/L)	7	0.279	0.020	0.250	0.300	16	0.251	0.018	0.220	0.280
Total Phosphorus (mg/L)	7	0.021	0.004	0.020	0.030	8	0.024	0.009	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	7	2.057	0.251	1.600	2.400	16	2.975	0.969	1.900	5.800
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.275	0.575	1.700	3.000
BOD (mg/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	4	21.850	3.292	19.000	24.800
Magnesium (mg/L)	0	.	.	.	.	4	5.132	1.106	3.900	6.130
Sodium (mg/L)	0	.	.	.	.	4	6.450	2.022	4.700	8.300
Potassium (mg/L)	0	.	.	.	.	4	1.525	0.150	1.400	1.700
Chloride (mg/L)	0	.	.	.	.	4	6.500	2.887	4.000	9.000
Sulfate (mg/L)	0	.	.	.	.	4	12.750	3.775	9.000	16.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	4	182.500	49.917	130.000	230.000
Dissolved Iron (ug/L)	0	.	.	.	.	4	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	4	91.500	23.700	72.000	126.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Barium (ug/L)	0	.	.	.	.	4	27.500	9.574	20.000	40.000
Beryllium (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	4	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	4	0.200	0.115	0.100	0.300
Chromium (ug/L)	0	.	.	.	.	4	2.000	1.414	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	4	8.000	3.559	5.000	12.000
Lead (ug/L)	0	.	.	.	.	4	1.250	0.500	1.000	2.000
Nickel (ug/L)	0	.	.	.	.	4	2.750	2.062	1.000	5.000
Silver (ug/L)	0	.	.	.	.	4	5.100	5.658	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	4	13.250	15.196	5.000	36.000
Aluminum (ug/L)	0	.	.	.	.	4	107.500	69.462	50.000	190.000
Selenium (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	4	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 518.0

	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	37	15.651	1.648	13.200	17.400	40	15.860	1.124	14.500	17.900
Dissolved Oxygen (mg/L)	37	7.981	0.790	6.600	9.400	40	7.805	0.932	6.700	9.700
pH (standard units)	25	7.320	0.104	7.200	7.500	40	7.620	0.482	7.100	8.400
Conductivity (umhos/cm)	25	178.000	4.082	170.000	180.000	10	205.000	0.000	205.000	205.000
Alkalinity (mg/L)	6	50.333	1.211	49.000	52.000	16	62.813	4.037	58.000	69.000
Turbidity (mg/L)	0	.	.	.	.	8	3.750	2.041	1.100	6.300
Organic Nitrogen (mg/L)	6	0.080	0.029	0.030	0.100	16	0.173	0.060	0.090	0.320
Ammonia Nitrogen (mg/L)	6	0.098	0.084	0.020	0.210	16	0.044	0.013	0.030	0.070
Nitrite+Nitrate Nitrogen (mg/L)	6	0.335	0.038	0.300	0.370	16	0.269	0.031	0.230	0.310
Total Phosphorus (mg/L)	6	0.030	0.000	0.030	0.030	8	0.030	0.012	0.010	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.016	0.006	0.010	0.030
Total Organic Carbon (mg/L)	6	1.800	0.400	1.000	2.100	16	2.531	0.673	1.400	3.400
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	1.900	0.745	1.200	2.900
BOD (mg/L)	0	.	.	.	.	2	1.150	0.212	1.000	1.300
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	2	21.700	1.838	20.400	23.000
Magnesium (mg/L)	0	.	.	.	.	2	5.485	0.120	5.400	5.570
Sodium (mg/L)	0	.	.	.	.	2	7.850	1.768	6.600	9.100
Potassium (mg/L)	0	.	.	.	.	2	1.750	0.212	1.600	1.900
Chloride (mg/L)	0	.	.	.	.	2	8.500	2.121	7.000	10.000
Sulfate (mg/L)	0	.	.	.	.	2	13.000	2.828	11.000	15.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	2	235.000	21.213	220.000	250.000
Dissolved Iron (ug/L)	0	.	.	.	.	2	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	2	76.000	15.556	65.000	87.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	2	1.500	0.707	1.000	2.000
Barium (ug/L)	0	.	.	.	.	2	30.000	14.142	20.000	40.000
Beryllium (ug/L)	0	.	.	.	.	2	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	2	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	2	0.100	0.000	0.100	0.100
Chromium (ug/L)	0	.	.	.	.	2	1.500	0.707	1.000	2.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	2	33.500	23.335	17.000	50.000
Lead (ug/L)	0	.	.	.	.	2	3.500	3.536	1.000	6.000
Nickel (ug/L)	0	.	.	.	.	2	1.500	0.707	1.000	2.000
Silver (ug/L)	0	.	.	.	.	2	5.100	6.930	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	2	10.000	7.071	5.000	15.000
Aluminum (ug/L)	0	.	.	.	.	2	115.000	49.497	80.000	150.000
Selenium (ug/L)	0	.	.	.	.	2	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	2	0.200	0.000	0.200	0.200

APPENDIX 4 D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 527.4

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	28	5.368	2.372	2.500	8.300	42	5.095	1.297	3.000	6.700
Dissolved Oxygen (mg/L)	28	12.461	0.786	11.200	13.600	41	11.187	1.086	9.270	12.400
pH (standard units)	28	7.596	0.257	7.200	8.000	38	7.437	0.219	6.700	7.860
Conductivity (umhos/cm)	28	176.786	15.882	150.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	18	56.889	1.906	54.000	61.000	26	56.154	8.776	47.000	70.000
Turbidity (mg/L)	15	12.840	5.863	5.000	20.000	20	7.140	3.116	3.600	12.000
Organic Nitrogen (mg/L)	18	0.122	0.041	0.050	0.230	24	0.220	0.129	0.070	0.620
Ammonia Nitrogen (mg/L)	18	0.064	0.032	0.010	0.110	24	0.028	0.015	0.010	0.060
Nitrite+Nitrate Nitrogen (mg/L)	18	0.596	0.202	0.450	1.300	24	0.497	0.222	0.370	1.400
Total Phosphorus (mg/L)	18	0.031	0.010	0.020	0.050	18	0.037	0.008	0.020	0.050
Dissolved Phosphorus (mg/L)	16	0.042	0.098	0.010	0.410	24	0.012	0.004	0.010	0.020
Total Organic Carbon (mg/L)	18	2.350	0.651	1.700	3.600	24	2.471	0.650	1.500	3.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	18	1.844	0.953	0.800	3.300
BOD (mg/L)	15	1.293	0.397	1.000	2.200	16	1.387	0.408	1.000	2.500
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	16	19.688	2.056	17.000	23.000	15	21.613	2.547	18.000	25.000
Magnesium (mg/L)	16	4.700	0.708	3.600	5.800	15	5.183	0.779	4.100	6.370
Sodium (mg/L)	16	4.987	1.290	3.000	6.200	15	6.080	1.531	4.300	8.700
Potassium (mg/L)	16	1.319	0.054	1.200	1.400	15	1.340	0.206	1.000	1.600
Chloride (mg/L)	15	6.400	1.298	4.000	8.000	16	6.688	1.138	6.000	9.000
Sulfate (mg/L)	15	15.467	2.588	10.000	19.000	16	15.688	2.626	12.000	20.000
Silicon (mg/L)	8	6.662	0.635	5.800	7.500	0	.	.	.	.
Fluoride (mg/L)	8	0.079	0.023	0.050	0.100	0	.	.	.	.
Total Iron (ug/L)	16	565.000	262.679	280.000	960.000	16	306.250	189.381	80.000	610.000
Dissolved Iron (ug/L)	16	112.500	63.927	50.000	230.000	16	38.750	23.345	10.000	70.000
Total Manganese (ug/L)	16	56.875	8.732	40.000	70.000	16	47.500	12.675	30.000	74.000
Dissolved Manganese (ug/L)	16	15.000	8.165	10.000	30.000	0	.	.	.	.
Arsenic (ug/L)	16	4.375	1.204	2.000	5.000	16	1.250	0.577	1.000	3.000
Barium (ug/L)	16	100.000	0.000	100.000	100.000	16	24.375	8.139	10.000	30.000
Beryllium (ug/L)	16	10.000	0.000	10.000	10.000	16	1.000	0.000	1.000	1.000
Boron (ug/L)	15	77.333	34.323	10.000	100.000	16	55.000	20.000	50.000	130.000
Cadmium (ug/L)	16	1.063	0.250	1.000	2.000	16	0.331	0.430	0.100	1.400
Chromium (ug/L)	16	5.563	2.250	5.000	14.000	16	1.430	1.031	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	16	19.375	12.894	10.000	50.000	16	11.075	14.165	5.000	64.000
Lead (ug/L)	16	18.750	19.254	10.000	80.000	16	5.375	4.530	1.000	13.000
Nickel (ug/L)	16	51.250	5.000	50.000	70.000	16	2.563	2.394	1.000	8.000
Silver (ug/L)	16	10.000	0.000	10.000	10.000	16	7.550	4.383	0.200	10.000
Zinc (ug/L)	16	130.625	393.149	10.000	1600.000	16	13.000	6.861	5.000	31.000
Aluminum (ug/L)	16	890.625	634.786	300.000	2300.000	16	227.500	93.345	60.000	370.000
Selenium (ug/L)	16	2.125	2.156	1.000	10.000	16	1.500	0.730	1.000	3.000
Mercury (ug/L)	16	0.200	0.000	0.200	0.200	16	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 527.4

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	30	17.603	0.989	16.500	20.000	47	18.026	1.033	16.500	19.500
Dissolved Oxygen (mg/L)	30	7.743	0.731	6.200	8.900	47	7.725	1.684	4.900	9.750
pH (standard units)	26	7.377	0.131	7.200	7.700	47	7.468	0.230	7.200	8.000
Conductivity (umhos/cm)	30	154.000	8.137	140.000	160.000	12	160.750	1.215	159.000	163.000
Alkalinity (mg/L)	14	53.071	6.708	39.000	63.000	25	59.000	7.906	46.000	67.000
Turbidity (mg/L)	16	7.294	3.933	3.200	15.000	15	5.827	2.128	2.900	9.800
Organic Nitrogen (mg/L)	18	0.095	0.031	0.040	0.180	25	0.202	0.083	0.110	0.410
Ammonia Nitrogen (mg/L)	18	0.071	0.024	0.040	0.120	25	0.062	0.039	0.020	0.210
Nitrite+Nitrate Nitrogen (mg/L)	18	0.351	0.107	0.220	0.660	25	0.299	0.098	0.020	0.440
Total Phosphorus (mg/L)	18	0.023	0.007	0.020	0.040	19	0.016	0.007	0.010	0.030
Dissolved Phosphorus (mg/L)	16	0.015	0.013	0.010	0.060	21	0.010	0.002	0.010	0.020
Total Organic Carbon (mg/L)	18	2.578	1.108	1.200	5.400	25	2.352	0.889	1.200	4.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	13	1.523	0.442	1.100	2.200
BOD (mg/L)	16	1.006	0.025	1.000	1.100	16	1.362	0.435	1.000	2.300
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	16	19.063	2.112	16.000	22.000	16	21.063	5.026	16.000	38.000
Magnesium (mg/L)	16	4.569	0.379	4.000	5.200	16	4.912	1.181	3.700	8.400
Sodium (mg/L)	16	4.644	1.346	3.600	7.300	16	4.625	0.966	3.800	6.300
Potassium (mg/L)	16	1.200	0.097	1.000	1.400	16	1.350	0.052	1.300	1.400
Chloride (mg/L)	16	4.250	0.447	4.000	5.000	16	4.869	0.769	4.000	6.000
Sulfate (mg/L)	14	10.786	2.155	8.000	14.000	12	12.417	2.575	10.000	16.000
Silicon (mg/L)	4	5.450	0.058	5.400	5.500	0	.	.	.	.
Fluoride (mg/L)	7	0.077	0.021	0.060	0.100	0	.	.	.	.
Total Iron (ug/L)	16	541.875	187.376	210.000	950.000	16	162.500	50.398	100.000	280.000
Dissolved Iron (ug/L)	16	65.000	32.455	50.000	160.000	14	20.714	15.424	10.000	50.000
Total Manganese (ug/L)	16	40.000	9.661	30.000	60.000	12	43.417	8.328	30.000	62.000
Dissolved Manganese (mg/L)	16	10.625	2.500	10.000	20.000	0	.	.	.	.
Arsenic (ug/L)	16	5.500	2.966	2.000	10.000	16	1.000	0.000	1.000	1.000
Barium (ug/L)	16	100.000	0.000	100.000	100.000	16	43.125	34.587	10.000	100.000
Beryllium (ug/L)	16	10.000	0.000	10.000	10.000	16	3.375	3.981	1.000	10.000
Boron (ug/L)	16	75.625	32.653	10.000	100.000	16	39.250	19.234	6.000	50.000
Cadmium (ug/L)	15	1.067	0.258	1.000	2.000	16	0.112	0.050	0.100	0.300
Chromium (ug/L)	16	5.000	0.000	5.000	5.000	16	1.313	0.602	1.000	3.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	16	21.250	15.438	10.000	50.000	16	20.438	24.555	5.000	90.000
Lead (ug/L)	16	10.125	0.500	10.000	12.000	12	2.333	2.498	1.000	10.000
Nickel (ug/L)	16	50.000	0.000	50.000	50.000	16	1.313	0.479	1.000	2.000
Silver (ug/L)	16	10.000	0.000	10.000	10.000	16	7.550	4.383	0.200	10.000
Zinc (ug/L)	16	16.250	8.062	10.000	30.000	16	20.500	34.512	5.000	120.000
Aluminum (ug/L)	16	706.250	304.344	200.000	1200.000	16	95.000	26.583	50.000	140.000
Selenium (ug/L)	16	1.938	0.929	1.000	4.000	16	1.000	0.000	1.000	1.000
Mercury (ug/L)	16	0.387	0.475	0.200	1.600	16	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 527.4

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	34	25.253	0.489	24.500	26.500	48	25.219	0.537	24.500	26.400
Dissolved Oxygen (mg/L)	34	4.812	1.143	1.700	7.000	48	5.049	0.919	2.900	6.600
pH (standard units)	29	7.110	0.379	6.200	7.500	48	7.549	0.482	7.000	9.000
Conductivity (umhos/cm)	34	176.176	15.957	160.000	200.000	12	180.000	0.000	180.000	180.000
Alkalinity (mg/L)	22	55.909	4.898	47.000	61.000	18	65.833	7.310	55.000	73.000
Turbidity (mg/L)	19	6.789	1.744	4.600	10.000	14	5.357	1.083	4.200	8.200
Organic Nitrogen (mg/L)	23	0.173	0.072	0.060	0.380	25	0.217	0.119	0.110	0.580
Ammonia Nitrogen (mg/L)	23	0.065	0.077	0.030	0.410	25	0.040	0.013	0.300	0.090
Nitrite+Nitrate Nitrogen (mg/L)	23	0.474	0.675	0.250	3.500	25	0.373	0.652	0.180	3.500
Total Phosphorus (mg/L)	23	0.024	0.010	0.010	0.050	12	0.029	0.010	0.020	0.040
Dissolved Phosphorus (mg/L)	20	0.014	0.005	0.010	0.020	24	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	19	2.032	0.406	1.500	3.100	25	3.180	0.703	1.900	4.200
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	10	2.330	0.817	1.500	3.500
BOD (mg/L)	20	1.420	0.426	1.000	2.500	17	1.388	0.385	1.000	2.200
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	20	20.300	2.296	16.000	23.000	17	24.812	4.732	18.000	35.000
Magnesium (mg/L)	20	4.600	0.299	4.200	5.000	17	5.302	0.850	3.800	6.420
Sodium (mg/L)	20	5.120	1.290	1.600	9.000	17	6.159	1.330	4.700	8.400
Potassium (mg/L)	20	1.455	0.305	1.200	2.100	17	1.424	0.152	1.200	1.700
Chloride (mg/L)	20	6.200	0.410	6.000	7.000	17	6.765	1.855	4.000	9.000
Sulfate (mg/L)	18	12.667	1.495	9.000	16.000	17	11.824	2.698	9.000	17.000
Silicon (mg/L)	8	5.137	0.160	4.900	5.400	0	.	.	.	.
Fluoride (mg/L)	11	0.093	0.006	0.080	0.100	0	.	.	.	.
Total Iron (ug/L)	20	317.000	162.937	120.000	680.000	17	131.765	55.027	50.000	210.000
Dissolved Iron (ug/L)	20	52.500	11.180	50.000	100.000	17	32.353	19.852	10.000	50.000
Total Manganese (ug/L)	20	104.500	36.631	40.000	180.000	17	91.471	18.389	66.000	126.000
Dissolved Manganese (ug/L)	20	32.000	21.909	10.000	70.000	0	.	.	.	.
Arsenic (ug/L)	20	5.250	1.585	4.000	11.000	17	1.529	0.874	1.000	3.000
Barium (ug/L)	20	100.000	0.000	100.000	100.000	17	47.647	31.924	10.000	100.000
Beryllium (ug/L)	20	10.000	0.000	10.000	10.000	17	3.118	3.935	1.000	10.000
Boron (ug/L)	16	83.125	36.646	10.000	140.000	17	41.294	16.305	10.000	50.000
Cadmium (ug/L)	20	1.000	0.000	1.000	1.000	17	0.141	0.071	0.100	0.300
Chromium (ug/L)	20	5.000	0.000	5.000	5.000	17	1.882	1.269	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	20	42.500	42.658	10.000	200.000	17	9.588	5.767	5.000	26.000
Lead (ug/L)	20	10.100	0.447	10.000	12.000	17	3.706	4.947	1.000	14.000
Nickel (ug/L)	20	93.500	194.538	50.000	920.000	17	2.765	2.611	1.000	10.000
Silver (ug/L)	20	10.000	0.000	10.000	10.000	17	7.694	4.285	0.200	10.000
Zinc (ug/L)	20	18.000	11.517	10.000	50.000	17	40.588	85.301	5.000	330.000
Aluminum (ug/L)	20	489.500	208.162	200.000	800.000	17	109.412	43.225	50.000	180.000
Selenium (ug/L)	20	1.450	0.510	1.000	2.000	17	1.118	0.332	1.000	2.000
Mercury (ug/L)	20	0.205	0.022	0.200	0.300	17	0.206	0.024	0.200	0.300

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 527.4

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	38	15.682	1.602	13.500	17.400	41	15.885	1.368	14.000	17.900
Dissolved Oxygen (mg/L)	38	8.121	0.820	6.600	9.600	41	7.848	0.615	6.700	9.100
pH (standard units)	34	7.282	0.153	7.000	7.500	41	7.411	0.264	6.900	8.300
Conductivity (umhos/cm)	34	171.765	13.589	140.000	180.000	10	204.500	1.581	200.000	205.000
Alkalinity (mg/L)	18	49.778	6.093	39.000	58.000	23	63.000	3.330	56.000	70.000
Turbidity (mg/L)	20	6.235	2.416	2.200	10.000	18	4.133	1.918	1.100	7.700
Organic Nitrogen (mg/L)	22	0.139	0.049	0.070	0.250	23	0.132	0.066	0.040	0.340
Ammonia Nitrogen (mg/L)	22	0.046	0.048	0.020	0.250	23	0.035	0.011	0.020	0.060
Nitrite+Nitrate Nitrogen (mg/L)	22	0.325	0.070	0.180	0.420	23	0.260	0.027	0.230	0.310
Total Phosphorus (mg/L)	22	0.026	0.008	0.010	0.046	13	0.029	0.015	0.010	0.050
Dissolved Phosphorus (mg/L)	20	0.012	0.006	0.010	0.030	23	0.013	0.005	0.010	0.030
Total Organic Carbon (mg/L)	18	2.483	0.735	1.000	3.700	23	2.900	2.720	1.300	15.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	1.858	0.763	1.100	3.000
BOD (mg/L)	20	1.140	0.127	1.000	1.400	15	1.453	0.327	1.000	2.000
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	18	18.167	3.130	13.000	22.000	16	22.094	1.116	20.200	24.000
Magnesium (mg/L)	18	4.661	0.576	3.700	5.300	16	5.477	0.210	5.100	5.800
Sodium (mg/L)	18	6.483	0.820	5.000	7.300	16	7.700	0.978	6.700	9.100
Potassium (mg/L)	18	1.422	0.241	1.200	1.800	16	1.656	0.103	1.500	1.900
Chloride (mg/L)	20	7.500	1.147	6.000	9.000	13	7.923	2.465	3.000	10.000
Sulfate (mg/L)	20	14.450	3.410	9.000	20.000	15	14.200	1.568	11.000	18.000
Silicon (mg/L)	8	4.187	0.064	4.100	4.300	0	.	.	.	.
Fluoride (mg/L)	8	0.072	0.007	0.060	0.080	0	.	.	.	.
Total Iron (ug/L)	18	570.000	907.602	240.000	4200.000	16	179.375	79.033	10.000	390.000
Dissolved Iron (ug/L)	20	50.500	8.870	30.000	70.000	15	20.667	18.310	10.000	50.000
Total Manganese (ug/L)	18	53.333	14.552	30.000	90.000	16	62.875	21.169	40.000	107.000
Dissolved Manganese (ug/L)	20	12.000	4.104	10.000	20.000	0	.	.	.	.
Arsenic (ug/L)	20	3.900	1.447	2.000	5.000	16	1.500	0.730	1.000	3.000
Barium (ug/L)	18	111.111	32.338	100.000	200.000	16	45.000	33.665	20.000	100.000
Beryllium (ug/L)	18	10.000	0.000	10.000	10.000	16	3.250	4.025	1.000	10.000
Boron (ug/L)	12	129.167	97.929	40.000	280.000	16	42.000	14.385	14.000	50.000
Cadmium (ug/L)	18	1.056	0.236	1.000	2.000	16	0.606	0.849	0.100	2.400
Chromium (ug/L)	18	5.611	1.787	5.000	11.000	16	1.438	0.892	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	18	96.111	212.441	10.000	680.000	16	11.250	6.245	5.000	28.000
Lead (ug/L)	18	10.000	0.000	10.000	10.000	16	5.813	9.786	1.000	40.000
Nickel (ug/L)	18	130.556	276.075	50.000	1200.000	16	1.500	1.095	1.000	5.000
Silver (ug/L)	18	10.000	0.000	10.000	10.000	16	7.550	4.383	0.200	10.000
Zinc (ug/L)	18	38.889	63.606	10.000	270.000	16	7.563	2.476	5.000	11.000
Aluminum (ug/L)	18	461.111	222.655	200.000	900.000	16	113.125	38.595	50.000	190.000
Selenium (ug/L)	20	1.250	0.444	1.000	2.000	16	1.000	0.000	1.000	1.000
Mercury (ug/L)	20	0.260	0.226	0.200	1.200	16	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 528.0

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	6	2.500	0.000	2.500	2.500	23	4.883	1.151	3.000	6.100
Dissolved Oxygen (mg/L)	6	13.250	0.122	13.200	13.500	23	11.449	0.874	9.900	12.410
pH (standard units)	6	8.000	0.000	8.000	8.000	23	7.690	0.417	7.000	8.390
Conductivity (umhos/cm)	6	200.000	0.000	200.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	3	59.000	0.000	59.000	59.000	17	55.706	8.550	48.000	69.000
Turbidity (mg/L)	0	.	.	.	.	14	7.957	3.333	4.100	13.000
Organic Nitrogen (mg/L)	3	0.127	0.032	0.090	0.150	16	0.233	0.121	0.050	0.530
Ammonia Nitrogen (mg/L)	3	0.027	0.021	0.010	0.050	16	0.026	0.011	0.010	0.040
Nitrite+Nitrate Nitrogen (mg/L)	3	0.450	0.000	0.450	0.450	16	0.427	0.034	0.360	0.460
Total Phosphorus (mg/L)	3	0.017	0.006	0.010	0.020	12	0.043	0.011	0.030	0.060
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.013	0.006	0.010	0.030
Total Organic Carbon (mg/L)	3	2.033	0.208	1.800	2.200	16	2.494	0.857	1.300	4.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	1.758	0.914	0.800	3.200
BOD (mg/L)	0	.	.	.	.	6	1.417	0.214	1.200	1.800
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	6	20.233	2.613	17.000	23.900
Magnesium (mg/L)	0	.	.	.	.	6	4.947	1.011	3.900	6.310
Sodium (mg/L)	0	.	.	.	.	6	6.133	1.793	4.300	8.400
Potassium (mg/L)	0	.	.	.	.	6	1.360	0.298	0.960	1.600
Chloride (mg/L)	0	.	.	.	.	6	7.000	1.265	6.000	9.000
Sulfate (mg/L)	0	.	.	.	.	6	16.000	3.286	13.000	21.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	6	281.667	204.980	70.000	590.000
Dissolved Iron (ug/L)	0	.	.	.	.	6	41.667	32.506	10.000	90.000
Total Manganese (ug/L)	0	.	.	.	.	6	40.333	9.416	30.000	52.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	6	1.667	1.211	1.000	4.000
Barium (ug/L)	0	.	.	.	.	6	21.667	9.832	10.000	30.000
Beryllium (ug/L)	0	.	.	.	.	6	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	6	98.333	104.387	50.000	310.000
Cadmium (ug/L)	0	.	.	.	.	6	0.267	0.288	0.100	0.800
Chromium (ug/L)	0	.	.	.	.	6	1.000	0.000	1.000	1.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	6	8.500	4.416	5.000	16.000
Lead (ug/L)	0	.	.	.	.	6	3.000	2.000	1.000	6.000
Nickel (ug/L)	0	.	.	.	.	6	1.667	0.816	1.000	3.000
Silver (ug/L)	0	.	.	.	.	6	6.733	5.061	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	6	17.000	9.252	6.000	26.000
Aluminum (ug/L)	0	.	.	.	.	6	236.667	72.296	140.000	320.000
Selenium ug/L)	0	.	.	.	.	6	1.167	0.408	1.000	2.000
Mercury (ug/L)	0	.	.	.	.	6	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 528.0

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	11	17.027	0.261	16.800	17.300	23	17.787	0.924	16.300	19.000
Dissolved Oxygen (mg/L)	11	8.245	0.499	7.600	8.800	23	7.614	1.696	4.800	9.740
pH (standard units)	11	7.318	0.125	7.200	7.500	23	7.438	0.250	7.100	7.700
Conductivity (umhos/cm)	11	157.273	4.671	150.000	160.000	6	162.667	1.211	162.000	165.000
Alkalinity (mg/L)	6	53.833	4.401	51.000	60.000	17	59.176	7.568	47.000	68.000
Turbidity (mg/L)	0	.	.	.	.	9	5.022	1.840	3.300	7.400
Organic Nitrogen (mg/L)	6	0.117	0.078	0.050	0.260	16	0.232	0.111	0.110	0.560
Ammonia Nitrogen (mg/L)	6	0.068	0.033	0.050	0.130	16	0.068	0.055	0.020	0.210
Nitrite+Nitrate Nitrogen (mg/L)	6	0.312	0.086	0.230	0.390	16	0.313	0.074	0.250	0.430
Total Phosphorus (mg/L)	6	0.020	0.006	0.010	0.030	12	0.015	0.005	0.010	0.020
Dissolved Phosphorus (mg/L)	0	.	.	.	.	12	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	6	2.333	0.524	1.400	2.900	16	2.219	0.601	1.300	3.700
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	1.675	0.474	1.200	2.300
BOD (mg/L)	0	.	.	.	.	3	1.967	1.097	1.100	3.200
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	3	27.667	9.815	22.000	39.000
Magnesium (mg/L)	0	.	.	.	.	3	6.100	1.400	5.100	7.700
Sodium (mg/L)	0	.	.	.	.	3	5.567	1.012	4.400	6.200
Potassium (mg/L)	0	.	.	.	.	3	1.333	0.058	1.300	1.400
Chloride (mg/L)	0	.	.	.	.	3	5.433	0.981	4.300	6.000
Sulfate (mg/L)	0	.	.	.	.	3	14.000	2.646	11.000	16.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	3	163.333	101.160	100.000	280.000
Dissolved Iron (ug/L)	0	.	.	.	.	3	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	3	46.333	20.257	30.000	69.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L	0	.	.	.	.	3	1.000	0.000	1.000	1.000
Barium (ug/L)	0	.	.	.	.	3	26.667	11.547	20.000	40.000
Beryllium (ug/L)	0	.	.	.	.	3	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	3	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	3	0.100	0.000	0.100	0.100
Chromium (ug/L)	0	.	.	.	.	3	1.333	0.577	1.000	2.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	3	31.333	45.611	5.000	84.000
Lead (ug/L)	0	.	.	.	.	3	1.667	1.155	1.000	3.000
Nickel (ug/L)	0	.	.	.	.	3	1.667	0.577	1.000	2.000
Silver (ug/L)	0	.	.	.	.	3	3.467	5.658	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	3	63.333	101.036	5.000	180.000
Aluminum (ug/L)	0	.	.	.	.	3	103.333	40.415	80.000	150.000
Selenium (ug/L)	0	.	.	.	.	3	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	3	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 528.0

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	13	25.277	0.885	24.300	26.400	23	25.452	0.443	25.000	26.200
Dissolved Oxygen (mg/L)	13	3.708	1.090	1.700	4.900	23	5.199	1.037	3.440	6.200
pH (standard units)	13	7.200	0.187	7.000	7.500	17	7.418	0.204	7.100	7.900
Conductivity (umhos/cm)	13	170.769	10.377	160.000	180.000	5	180.000	0.000	180.000	180.000
Alkalinity (mg/L)	7	51.429	4.577	46.000	59.000	13	67.154	6.719	57.000	74.000
Turbidity (mg/L)	0	.	.	.	.	10	5.000	0.767	4.200	6.400
Organic Nitrogen (mg/L)	7	0.191	0.181	0.090	0.600	16	0.227	0.127	0.110	0.580
Ammonia Nitrogen (mg/L)	7	0.040	0.018	0.030	0.080	16	0.038	0.010	0.030	0.060
Nitrite+Nitrate Nitrogen (mg/L)	7	0.277	0.028	0.250	0.310	16	0.231	0.028	0.180	0.260
Total Phosphorus (mg/L)	7	0.023	0.005	0.020	0.030	8	0.026	0.007	0.020	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	7	1.957	0.207	1.600	2.200	16	3.312	0.805	1.800	4.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.412	0.822	1.500	3.300
BOD (mg/L)	0	.	.	.	.	4	1.050	0.100	1.000	1.200
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	4	22.50	3.872	19.000	25.900
Magnesium (mg/L)	0	.	.	.	.	4	5.070	1.295	3.900	6.240
Sodium (mg/L)	0	.	.	.	.	4	6.425	2.056	4.600	8.400
Potassium (mg/L)	0	.	.	.	.	4	1.475	0.096	1.400	1.600
Chloride (mg/L)	0	.	.	.	.	4	6.500	2.887	4.000	9.000
Sulfate (mg/L)	0	.	.	.	.	4	13.250	3.775	10.000	17.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	4	145.000	60.277	90.000	230.000
Dissolved Iron (ug/L)	0	.	.	.	.	4	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	4	76.500	19.875	56.000	95.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/l)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Barium (ug/l)	0	.	.	.	.	4	30.000	14.142	10.000	40.000
Beryllium (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	4	52.500	5.000	50.000	60.000
Cadmium (ug/L)	0	.	.	.	.	4	0.175	0.096	0.100	0.300
Chromium (ug/L)	0	.	.	.	.	4	2.000	1.155	1.000	3.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	4	9.250	2.986	5.000	12.000
Lead (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Nickel (ug/L)	0	.	.	.	.	4	2.250	1.500	1.000	4.000
Silver (ug/L)	0	.	.	.	.	4	5.100	5.658	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	4	5.250	0.500	5.000	6.000
Aluminum (ug/L)	0	.	.	.	.	4	77.500	34.034	50.000	120.000
Selenium (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	4	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 528.0

Parameter	1973-1977 Preoperational Period					1982-1984 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	12	15.225	1.854	13.400	17.000	22	15.877	1.350	14.500	17.900
Dissolved Oxygen (mg/L)	12	7.683	1.079	6.600	9.100	22	7.800	0.605	6.700	8.700
pH (standard units)	12	7.300	0.104	7.200	7.400	22	7.305	0.232	6.800	7.500
Conductivity (umhos/cm)	12	180.000	0.000	180.000	180.000	6	204.167	2.041	200.000	205.000
Alkalinity (mg/L)	6	50.000	2.000	48.000	53.000	16	63.563	3.224	60.000	72.000
Turbidity (mg/L)	0	.	.	.	.	9	4.478	2.309	1.700	6.900
Organic Nitrogen (mg/L)	6	0.082	0.020	0.060	0.110	16	0.154	0.069	0.040	0.280
Ammonia Nitrogen (mg/L)	6	0.077	0.068	0.010	0.200	16	0.037	0.023	0.010	0.110
Nitrite+Nitrate Nitrogen (mg/L)	6	0.327	0.029	0.300	0.360	16	0.303	0.170	0.230	0.930
Total Phosphorus (mg/L)	6	0.027	0.005	0.020	0.030	8	0.031	0.016	0.010	0.060
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.012	0.004	0.010	0.020
Total Organic Carbon (mg/L)	6	1.833	0.327	1.500	2.400	16	2.650	1.174	1.400	6.400
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	1.962	0.812	1.200	3.100
BOD (mg/L)	0	.	.	.	.	3	1.133	0.231	1.000	1.400
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	4	21.625	1.601	20.000	23.000
Magnesium (mg/L)	0	.	.	.	.	4	5.412	0.180	5.200	5.640
Sodium (mg/L)	0	.	.	.	.	4	7.875	1.362	6.700	9.200
Potassium (mg/L)	0	.	.	.	.	4	1.700	0.115	1.600	1.800
Chloride (mg/L)	0	.	.	.	.	3	9.000	1.732	7.000	10.000
Sulfate (mg/L)	0	.	.	.	.	3	13.333	1.155	12.000	14.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	4	380.000	408.819	10.000	960.000
Dissolved Iron (ug/L)	0	.	.	.	.	3	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	4	78.750	32.674	52.000	122.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	4	1.500	1.000	1.000	3.000
Barium (ug/L)	0	.	.	.	.	4	27.500	15.000	10.000	40.000
Beryllium (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	4	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	4	0.100	0.000	0.100	0.100
Chromium (ug/L)	0	.	.	.	.	4	3.000	2.309	1.000	5.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	4	14.250	4.924	10.000	19.000
Lead (ug/L)	0	.	.	.	.	4	1.250	0.500	1.000	2.000
Nickel (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Silver (ug/L)	0	.	.	.	.	4	5.100	5.658	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	4	6.250	1.893	5.000	9.000
Aluminum (ug/L)	0	.	.	.	.	4	140.000	23.094	120.000	160.000
Selenium (ug/L)	0	.	.	.	.	4	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	4	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 529.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	10	4.200	1.793	2.500	6.000	36	4.756	1.242	3.000	6.200
Dissolved Oxygen (mg/L)	10	12.610	0.755	11.600	13.500	36	11.523	1.256	9.400	13.800
pH (standard units)	10	7.760	0.255	7.500	8.000	36	7.771	0.406	7.200	8.370
Conductivity (umhos/cm)	10	190.000	10.541	180.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	6	56.667	2.658	53.000	59.000	22	56.045	9.414	47.000	70.000
Turbidity (mg/L)	0	.	.	.	.	20	7.815	3.361	4.700	14.000
Organic Nitrogen (mg/L)	6	0.108	0.019	0.080	0.130	24	0.232	0.115	0.010	0.460
Ammonia Nitrogen (mg/L)	6	0.072	0.033	0.010	0.100	24	0.026	0.013	0.010	0.050
Nitrite+Nitrate Nitrogen (mg/L)	6	0.503	0.056	0.440	0.570	24	0.420	0.044	0.340	0.460
Total Phosphorus (mg/L)	6	0.028	0.013	0.010	0.040	20	0.036	0.007	0.020	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	21	0.013	0.006	0.010	0.030
Total Organic Carbon (mg/L)	6	2.150	0.532	1.600	2.900	24	2.467	0.665	1.400	3.700
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	20	1.845	0.926	0.600	3.100
BOD (mg/L)	0	.	.	.	.	12	1.608	0.235	1.300	2.100
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	13	20.554	2.898	17.000	24.300
Magnesium (mg/L)	0	.	.	.	.	13	4.997	1.041	3.900	6.560
Sodium (mg/L)	0	.	.	.	.	13	6.315	1.768	4.300	8.600
Potassium (mg/L)	0	.	.	.	.	13	1.352	0.261	0.970	1.600
Chloride (mg/L)	0	.	.	.	.	12	7.000	1.279	6.000	9.000
Sulfate (mg/L)	0	.	.	.	.	12	15.917	2.746	13.000	20.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	13	320.000	239.548	70.000	700.000
Dissolved Iron (ug/L)	0	.	.	.	.	11	26.364	22.482	10.000	80.000
Total Manganese (ug/L)	0	.	.	.	.	13	42.462	9.997	30.000	58.000
Arsenic (ug/L)	0	.	.	.	.	13	1.538	0.877	1.000	3.000
Barium (ug/L)	0	.	.	.	.	13	19.231	8.623	10.000	30.000
Beryllium (ug/L)	0	.	.	.	.	13	1.000	0.000	1.000	1.00
Boron (ug/L)	0	.	.	.	.	13	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	13	0.154	0.113	0.100	0.500
Chromium (ug/L)	0	.	.	.	.	13	1.077	0.277	1.000	2.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	13	8.000	2.550	5.000	11.000
Lead (ug/L)	0	.	.	.	.	13	3.154	3.532	1.000	14.000
Nickel (ug/L)	0	.	.	.	.	13	2.154	1.864	1.000	7.000
Silver (ug/L)	0	.	.	.	.	13	6.231	4.962	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	13	16.846	9.127	2.000	32.000
Aluminum (ug/L)	0	.	.	.	.	13	246.154	87.325	90.000	330.000
Selenium (ug/L)	0	.	.	.	.	13	1.462	0.776	1.000	3.000
Mercury (ug/L)	0	.	.	.	.	13	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 529.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	11	16.900	0.319	16.500	17.200	35	17.729	1.172	16.200	21.800
Dissolved Oxygen (mg/L)	11	7.818	0.598	7.200	8.500	35	8.051	1.923	5.200	10.400
pH (standard units)	11	7.291	0.104	7.200	7.400	35	7.427	0.263	7.100	7.900
Conductivity (umhos/cm)	11	157.273	4.671	150.000	160.000	6	162.500	0.548	162.000	163.000
Alkalinity (mg/L)	6	54.833	5.193	50.000	64.000	21	59.905	7.120	46.000	68.000
Turbidity (mg/L)	0	.	.	.	.	15	5.920	2.200	3.400	8.900
Organic Nitrogen (mg/L)	6	0.093	0.023	0.070	0.120	20	0.180	0.095	0.050	0.420
Ammonia Nitrogen (mg/L)	6	0.062	0.019	0.050	0.100	20	0.050	0.034	0.010	0.130
Nitrite+Nitrate Nitrogen (mg/L)	6	0.315	0.079	0.230	0.390	20	0.329	0.085	0.250	0.470
Total Phosphorus (mg/L)	6	0.022	0.004	0.020	0.030	16	0.023	0.011	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	6	2.050	0.339	1.700	2.600	20	2.450	0.910	1.300	5.100
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	1.750	0.397	1.200	2.200
BOD (mg/L)	0	.	.	.	.	10	1.560	0.657	1.000	2.700
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	10	27.600	8.822	19.000	40.000
Magnesium (mg/L)	0	.	.	.	.	10	6.250	1.849	4.300	8.700
Sodium (mg/L)	0	.	.	.	.	10	5.080	0.969	4.200	6.300
Potassium (mg/L)	0	.	.	.	.	10	1.330	0.048	1.300	1.400
Chloride (mg/L)	0	.	.	.	.	10	5.060	1.077	4.000	7.000
Sulfate (mg/L)	0	.	.	.	.	10	13.100	1.853	11.000	16.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	10	178.000	76.855	100.000	280.000
Dissolved Iron (ug/L)	0	.	.	.	.	10	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	10	48.200	16.498	31.000	73.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	10	1.000	0.000	1.000	1.000
Barium (ug/L)	0	.	.	.	.	10	33.000	13.375	20.000	50.000
Beryllium (ug/L)	0	.	.	.	.	10	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	10	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	10	0.100	0.000	0.100	0.100
Chromium (ug/L)	0	.	.	.	.	10	1.700	0.949	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	10	12.400	17.128	5.000	59.000
Lead (ug/L)	0	.	.	.	.	10	1.800	1.033	1.000	4.000
Nickel (ug/L)	0	.	.	.	.	10	1.200	0.422	1.000	2.000
Silver (ug/L)	0	.	.	.	.	10	6.080	5.061	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	10	34.400	65.651	5.000	220.000
Aluminum (ug/L)	0	.	.	.	.	10	99.000	40.675	50.000	160.000
Selenium (ug/L)	0	.	.	.	.	10	1.000	0.000	1.000	1.000
Mercury (ug/L)	0	.	.	.	.	10	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 529.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	10	25.220	1.175	24.200	27.000	33	25.400	0.930	24.000	27.100
Dissolved Oxygen (mg/L)	10	3.420	1.230	1.600	4.600	33	4.725	0.882	2.600	5.900
pH (standard units)	10	7.200	0.156	7.000	7.400	33	7.455	0.262	7.000	8.000
Conductivity (umhos/cm)	10	170.000	10.541	160.000	180.000	5	180.000	0.000	180.000	180.000
Alkalinity (mg/L)	7	51.286	3.592	47.000	55.000	16	66.000	7.659	56.000	76.000
Turbidity (mg/L)	0	.	.	.	.	15	4.580	1.293	2.500	7.400
Organic Nitrogen (mg/L)	7	0.136	0.073	0.050	0.280	22	0.191	0.084	0.070	0.480
Ammonia Nitrogen (mg/L)	7	0.056	0.029	0.030	0.110	22	0.036	0.011	0.020	0.060
Nitrite+Nitrate Nitrogen (mg/L)	7	0.291	0.028	0.260	0.330	22	0.227	0.071	0.020	0.310
Total Phosphorus (mg/L)	7	0.023	0.005	0.020	0.030	14	0.023	0.013	0.010	0.050
Dissolved Phosphorus (mg/L)	0	.	.	.	.	20	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	7	2.000	0.208	1.800	2.400	21	2.905	0.622	2.000	4.300
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	11	2.118	0.608	1.400	3.100
BOD (mg/L)	0	.	.	.	.	8	1.150	0.141	1.000	1.300
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	9	21.344	3.346	18.000	26.400
Magnesium (mg/L)	0	.	.	.	.	9	4.929	1.108	3.900	6.300
Sodium (mg/L)	0	.	.	.	.	9	6.267	1.861	4.600	8.400
Potassium (mg/L)	0	.	.	.	.	9	1.500	0.122	1.400	1.700
Chloride (mg/L)	0	.	.	.	.	8	6.625	2.560	4.000	9.000
Sulfate (mg/L)	0	.	.	.	.	8	12.875	3.482	9.000	18.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	9	140.000	71.589	60.000	290.000
Dissolved Iron (ug/L)	0	.	.	.	.	9	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	9	77.778	27.091	48.000	133.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	9	1.111	0.333	1.000	2.000
Barium (ug/L)	0	.	.	.	.	9	26.667	17.321	10.000	60.000
Beryllium (ug/L)	0	.	.	.	.	9	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	9	174.444	296.990	50.000	940.000
Cadmium (ug/L)	0	.	.	.	.	9	0.200	0.122	0.100	0.400
Chromium (ug/L)	0	.	.	.	.	9	2.222	1.302	1.000	4.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	9	11.000	11.136	5.000	40.000
Lead (ug/L)	0	.	.	.	.	9	1.889	2.667	1.000	9.000
Nickel (ug/L)	0	.	.	.	.	9	2.556	2.603	1.000	9.000
Silver (ug/L)	0	.	.	.	.	9	5.644	5.165	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	9	7.667	5.979	5.000	23.000
Aluminum (ug/L)	0	.	.	.	.	9	117.778	67.782	50.000	240.000
Selenium (ug/L)	0	.	.	.	.	9	1.111	0.333	1.000	2.000
Mercury (ug/L)	0	.	.	.	.	9	0.200	0.000	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 529.5

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	11	13.682	0.293	13.300	14.000	31	16.094	1.270	14.500	17.900
Dissolved Oxygen (mg/L)	11	7.818	1.073	6.800	9.300	31	7.748	0.570	6.700	8.700
pH (standard units)	11	7.318	0.087	7.200	7.400	31	7.397	0.448	6.900	9.100
Conductivity (umhos/cm)	11	180.000	0.000	180.000	180.000	5	203.000	2.739	200.000	205.000
Alkalinity (mg/L)	3	51.667	0.577	51.000	52.000	18	64.778	4.066	60.000	76.000
Turbidity (mg/L)	0	.	.	.	.	13	3.985	2.672	1.200	9.200
Organic Nitrogen (mg/L)	3	0.100	0.000	0.100	0.100	20	0.146	0.080	0.040	0.290
Ammonia Nitrogen (mg/L)	3	0.067	0.012	0.060	0.080	20	0.038	0.011	0.020	0.060
Nitrite+Nitrate Nitrogen (mg/L)	3	0.300	0.000	0.300	0.300	20	0.300	0.138	0.220	0.850
Total Phosphorus (mg/L)	3	0.020	0.000	0.020	0.020	12	0.022	0.010	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	20	0.013	0.005	0.010	0.020
Total Organic Carbon (mg/L)	3	1.833	0.115	1.700	1.900	20	2.700	1.838	1.400	10.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	1.975	0.756	1.200	2.900
BOD (mg/L)	0	.	.	.	.	7	1.043	0.079	1.000	1.200
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	8	21.925	1.663	19.600	24.000
Magnesium (mg/L)	0	.	.	.	.	8	5.521	0.232	5.300	6.010
Sodium (mg/L)	0	.	.	.	.	8	7.950	1.313	6.700	9.300
Potassium (mg/L)	0	.	.	.	.	8	1.700	0.107	1.600	1.800
Chloride (mg/L)	0	.	.	.	.	7	8.714	1.604	7.000	10.000
Sulfate (mg/L)	0	.	.	.	.	7	13.000	1.528	11.000	15.000
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	8	252.500	166.455	10.000	560.000
Dissolved Iron (ug/L)	0	.	.	.	.	7	10.000	0.000	10.000	10.000
Total Manganese (ug/L)	0	.	.	.	.	8	78.000	23.312	51.000	106.000
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	8	1.375	0.518	1.000	2.000
Barium (ug/L)	0	.	.	.	.	8	25.000	11.952	10.000	40.000
Beryllium (ug/L)	0	.	.	.	.	8	1.000	0.000	1.000	1.000
Boron (ug/L)	0	.	.	.	.	8	50.000	0.000	50.000	50.000
Cadmium (ug/L)	0	.	.	.	.	8	0.137	0.106	0.100	0.400
Chromium (ug/L)	0	.	.	.	.	8	3.000	3.780	1.000	12.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	8	17.250	13.210	8.000	47.000
Lead (ug/L)	0	.	.	.	.	8	1.125	0.354	1.000	2.000
Nickel (ug/L)	0	.	.	.	.	8	1.000	0.000	1.000	1.000
Silver (ug/L)	0	.	.	.	.	8	5.100	5.238	0.200	10.000
Zinc (ug/L)	0	.	.	.	.	8	8.625	4.406	5.000	15.000
Aluminum (ug/L)	0	.	.	.	.	8	117.500	32.404	80.000	160.000
Selenium (ug/L)	0	.	.	.	.	8	1.625	1.768	1.000	6.000
Mercury (ug/L)	0	.	.	.	.	8	0.212	0.035	0.200	0.300

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - WINTER, TRM 529.9

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	62	8.210	3.119	2.000	13.500	29	6.666	2.287	3.000	10.000
Dissolved Oxygen (mg/L)	60	10.610	1.260	7.700	17.300	30	10.339	1.354	7.800	13.200
pH (standard units)	15	7.407	0.301	6.800	7.800	5	7.752	0.353	7.480	8.360
Conductivity (umhos/cm)	16	153.563	18.450	97.000	180.000	0	.	.	.	.
Alkalinity (mg/L)	15	52.867	5.927	36.000	61.000	1	49.000	.	49.000	49.000
Turbidity (mg/L)	19	15.768	11.434	2.600	39.000	2	7.750	4.596	4.500	11.000
Organic Nitrogen (mg/L)	16	0.179	0.095	0.080	0.450	2	0.215	0.021	0.200	0.230
Ammonia Nitrogen (mg/L)	16	0.066	0.032	0.020	0.130	2	0.035	0.021	0.020	0.050
Nitrite+Nitrate Nitrogen (mg/L)	16	0.506	0.104	0.370	0.790	2	0.420	0.057	0.380	0.460
Total Phosphorus (mg/L)	16	0.028	0.011	0.020	0.050	2	0.035	0.007	0.030	0.040
Dissolved Phosphorus (mg/L)	8	0.031	0.042	0.010	0.130	1	0.010	.	0.010	0.010
Total Organic Carbon (mg/L)	7	2.129	0.250	1.700	2.500	2	2.600	1.273	1.700	3.500
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	2	1.950	1.485	0.900	3.000
BOD (mg/L)	8	1.425	0.468	1.000	2.100	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	14	18.500	3.611	8.000	23.000	0	.	.	.	.
Magnesium (mg/L)	14	4.471	0.816	2.700	5.600	0	.	.	.	.
Sodium (mg/L)	15	4.747	1.316	2.300	6.300	0	.	.	.	.
Potassium (mg/L)	15	1.307	0.139	1.000	1.500	0	.	.	.	.
Chloride (mg/L)	15	6.333	1.447	4.000	8.000	0	.	.	.	.
Sulfate (mg/L)	15	14.667	2.582	11.000	19.000	0	.	.	.	.
Silicon (mg/L)	7	5.943	0.800	4.900	7.200	0	.	.	.	.
Fluoride (mg/L)	12	0.082	0.026	0.040	0.100	0	.	.	.	.
Total Iron (ug/L)	16	468.750	274.855	120.000	920.000	0	.	.	.	.
Dissolved Iron (ug/L)	8	106.250	43.074	50.000	170.000	0	.	.	.	.
Total Manganese (ug/L)	16	63.125	30.270	30.000	160.000	0	.	.	.	.
Dissolved Manganese (ug/L)	8	22.500	27.646	10.000	90.000	0	.	.	.	.
Arsenic (ug/L)	8	4.250	1.389	2.000	5.000	0	.	.	.	.
Barium (ug/L)	8	100.000	0.000	100.000	100.000	0	.	.	.	.
Beryllium (ug/L)	7	10.000	0.000	10.000	10.000	0	.	.	.	.
Boron (ug/L)	8	71.250	33.568	20.000	100.000	0	.	.	.	.
Cadmium (ug/L)	8	1.125	0.354	1.000	2.000	0	.	.	.	.
Chromium (ug/L)	8	5.000	0.000	5.000	5.000	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	8	22.500	27.646	10.000	90.000	0	.	.	.	.
Lead (ug/L)	8	28.500	41.466	10.000	130.000	0	.	.	.	.
Nickel (ug/L)	8	80.000	84.853	50.000	290.000	0	.	.	.	.
Silver (ug/L)	8	10.000	0.000	10.000	10.000	0	.	.	.	.
Zinc (ug/L)	8	26.250	14.079	10.000	50.000	0	.	.	.	.
Aluminum (ug/L)	8	736.250	636.686	200.000	1800.000	0	.	.	.	.
Selenium (ug/L)	8	1.875	0.991	1.000	4.000	0	.	.	.	.
Mercury (ug/L)	8	0.200	0.000	0.200	0.200	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 529.9

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	63	18.546	3.375	9.500	24.500	49	17.457	4.064	10.000	25.000
Dissolved Oxygen (mg/L)	63	7.377	1.473	3.900	9.800	49	6.508	2.413	2.100	10.800
pH (standard units)	14	7.400	0.591	6.300	8.900	7	7.477	0.160	7.310	7.770
Conductivity (umhos/cm)	16	154.375	45.456	120.000	320.000	1	167.000	.	167.000	167.000
Alkalinity (mg/L)	16	52.750	7.629	41.000	75.000	3	63.667	3.512	60.000	67.000
Turbidity (mg/L)	16	10.137	5.963	4.100	24.000	2	6.000	3.111	3.800	8.200
Organic Nitrogen (mg/L)	16	0.125	0.041	0.060	0.220	3	0.180	0.155	0.030	0.340
Ammonia Nitrogen (mg/L)	16	0.053	0.018	0.020	0.080	3	0.043	0.032	0.020	0.080
Nitrite+Nitrate Nitrogen (mg/L)	16	0.336	0.092	0.150	0.500	3	0.330	0.050	0.280	0.380
Total Phosphorus (mg/L)	16	0.026	0.009	0.020	0.050	3	0.023	0.006	0.020	0.030
Dissolved Phosphorus (mg/L)	9	0.010	0.000	0.010	0.010	3	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	8	2.537	1.024	1.600	4.700	3	2.433	0.351	2.100	2.800
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	2	1.950	0.636	1.500	2.400
BOD (mg/L)	8	1.037	0.074	1.000	1.200	1	1.300	.	1.300	1.300
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	14	18.571	2.344	15.000	22.000	1	22.000	.	22.000	22.000
Magnesium (mg/L)	14	4.371	0.460	3.300	5.100	1	5.500	.	5.500	5.500
Sodium (mg/L)	14	4.521	1.281	3.400	7.000	1	4.100	.	4.100	4.100
Potassium (mg/L)	14	1.243	0.224	0.900	1.600	1	1.400	.	1.400	1.400
Chloride (mg/L)	14	4.500	0.760	4.000	6.000	1	5.000	.	5.000	5.000
Sulfate (mg/L)	14	11.571	2.243	7.000	16.000	0	.	.	.	.
Silicon (mg/L)	4	5.275	0.532	4.700	5.900	0	.	.	.	.
Fluoride (mg/L)	14	0.089	0.019	0.060	0.100	0	.	.	.	.
Total Iron (ug/L)	16	610.625	566.762	220.000	2500.000	1	130.000	.	130.000	130.000
Dissolved Iron (ug/L)	8	57.500	11.650	50.000	80.000	1	50.000	.	50.000	50.000
Total Manganese (ug/L)	16	43.125	17.017	20.000	80.000	0	.	.	.	.
Dissolved Manganese (ug/L)	8	10.000	0.000	10.000	10.000	0	.	.	.	.
Arsenic (ug/L)	8	5.500	3.071	2.000	10.000	1	1.000	.	1.000	1.000
Barium (ug/L)	8	100.000	0.000	100.000	100.000	1	100.000	.	100.000	100.000
Beryllium (ug/L)	8	10.000	0.000	10.000	10.000	1	10.000	.	10.000	10.000
Boron (ug/L)	8	102.500	33.274	70.000	180.000	1	8.000	.	8.000	8.000
Cadmium (ug/L)	8	1.500	0.926	1.000	3.000	1	0.100	.	0.100	0.100
Chromium (ug/L)	8	5.000	0.000	5.000	5.000	1	2.000	.	2.000	2.000
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	8	17.500	13.887	10.000	50.000	1	40.000	.	40.000	40.000
Lead (ug/L)	8	10.000	0.000	10.000	10.000	0	.	.	.	.
Nickel (ug/L)	8	50.000	0.000	50.000	50.000	1	1.000	.	1.000	1.000
Silver (ug/L)	8	10.000	0.000	10.000	10.000	1	10.000	.	10.000	10.000
Zinc (ug/L)	8	10.000	0.000	10.000	10.000	1	10.000	.	10.000	10.000
Aluminum (ug/L)	8	612.500	327.054	200.000	1000.000	1	100.000	.	100.000	100.000
Selenium (ug/L)	8	1.750	0.463	1.000	2.000	1	1.000	.	1.000	1.000
Mercury (ug/L)	8	0.575	0.328	0.200	1.000	1	0.200	.	0.200	0.200

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 529.9

Parameter	1975-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	75	24.973	1.281	21.000	27.500	58	24.714	1.238	21.100	26.600
Dissolved Oxygen (mg/L)	74	5.670	1.744	2.400	16.400	60	4.782	1.177	2.200	8.700
pH (standard units)	18	7.394	0.342	7.000	8.500	2	7.655	0.219	7.500	7.810
Conductivity (umhos/cm)	16	175.000	41.312	140.000	320.000	0	.	.	.	.
Alkalinity (mg/L)	18	57.778	8.454	43.000	82.000	2	66.500	10.607	59.000	74.000
Turbidity (mg/L)	26	6.450	3.000	1.000	10.000	2	4.850	0.495	4.500	5.200
Organic Nitrogen (mg/L)	18	0.190	0.089	0.040	0.370	2	0.200	0.042	0.170	0.230
Ammonia Nitrogen (mg/L)	18	0.061	0.040	0.010	0.180	2	0.025	0.007	0.020	0.030
Nitrite+Nitrate Nitrogen (mg/L)	16	0.293	0.048	0.200	0.390	2	0.200	0.057	0.160	0.240
Total Phosphorus (mg/L)	18	0.027	0.009	0.010	0.046	2	0.015	0.007	0.010	0.020
Dissolved Phosphorus (mg/L)	12	0.018	0.008	0.010	0.030	2	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	10	2.110	0.644	1.200	3.700	2	2.700	0.849	2.100	3.300
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	2	2.350	1.061	1.600	3.100
BOD (mg/L)	13	2.062	1.297	1.000	5.800	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	2	95.000	7.071	90.000	100.000	0	.	.	.	.
Calcium (mg/L)	18	20.389	2.852	13.000	24.000	0	.	.	.	.
Magnesium (mg/L)	18	4.650	0.499	3.300	5.300	0	.	.	.	.
Sodium (mg/L)	18	7.756	10.563	4.500	50.000	0	.	.	.	.
Potassium (mg/L)	18	1.506	0.344	1.200	2.200	0	.	.	.	.
Chloride (mg/L)	18	8.167	6.741	6.000	35.000	0	.	.	.	.
Sulfate (mg/L)	18	12.056	2.508	3.000	14.000	0	.	.	.	.
Silicon (mg/L)	8	5.375	0.709	4.700	6.600	0	.	.	.	.
Fluoride (mg/L)	18	0.089	0.017	0.050	0.100	0	.	.	.	.
Total Iron (ug/L)	18	426.111	224.398	170.000	1000.000	0	.	.	.	.
Dissolved Iron (ug/L)	12	58.333	28.868	50.000	150.000	0	.	.	.	.
Total Manganese (ug/L)	18	101.111	35.461	40.000	160.000	0	.	.	.	.
Dissolved Manganese (ug/L)	12	39.167	21.933	10.000	80.000	0	.	.	.	.
Arsenic (ug/L)	12	4.500	1.168	2.000	5.000	0	.	.	.	.
Barium (ug/L)	12	100.000	0.000	100.000	100.000	0	.	.	.	.
Beryllium (ug/L)	12	10.000	0.000	10.000	10.000	0	.	.	.	.
Boron (ug/L)	10	275.000	383.297	40.000	1000.000	0	.	.	.	.
Cadmium (ug/L)	12	2.667	3.676	1.000	13.000	0	.	.	.	.
Chromium (ug/L)	12	5.000	0.000	5.000	5.000	0	.	.	.	.
Cobalt (ug/L)	2	5.000	0.000	5.000	5.000	0	.	.	.	.
Copper (ug/L)	12	30.000	19.069	10.000	60.000	0	.	.	.	.
Lead (ug/L)	12	10.000	0.000	10.000	10.000	0	.	.	.	.
Nickel (ug/L)	12	62.500	43.301	50.000	200.000	0	.	.	.	.
Silver (ug/L)	12	10.000	0.000	10.000	10.000	0	.	.	.	.
Zinc (ug/L)	12	17.500	9.653	10.000	40.000	0	.	.	.	.
Aluminum (ug/L)	12	550.833	195.934	200.000	800.000	0	.	.	.	.
Selenium (ug/L)	12	1.500	0.522	1.000	2.000	0	.	.	.	.
Mercury (ug/L)	12	0.208	0.029	0.200	0.300	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 529.9

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	80	14.850	4.841	6.000	26.000	41	15.929	4.538	5.000	23.000
Dissolved Oxygen (mg/L)	78	8.115	1.357	5.600	13.280	42	7.326	1.258	5.000	10.100
pH (standard units)	14	7.293	0.371	6.300	7.800	6	7.350	0.122	7.100	7.400
Conductivity (umhos/cm)	14	163.571	16.919	140.000	180.000	0	.	.	.	.
Alkalinity (mg/L)	14	47.071	13.663	4.000	60.000	1	62.000	.	62.000	62.000
Turbidity (mg/L)	28	8.979	8.614	1.000	40.000	2	7.550	7.707	2.100	13.000
Organic Nitrogen (mg/L)	16	0.144	0.092	0.040	0.370	2	0.155	0.007	0.150	0.160
Ammonia Nitrogen (mg/L)	16	0.057	0.053	0.020	0.230	2	0.030	0.014	0.020	0.040
Nitrite+Nitrate Nitrogen (mg/L)	16	0.314	0.097	0.110	0.440	2	0.260	0.014	0.250	0.270
Total Phosphorus (mg/L)	16	0.022	0.009	0.010	0.040	2	0.030	0.014	0.020	0.040
Dissolved Phosphorus (mg/L)	8	0.014	0.007	0.010	0.030	2	0.015	0.007	0.010	0.020
Total Organic Carbon (mg/L)	10	2.280	0.567	1.600	3.200	2	2.200	0.990	1.500	2.900
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	2	1.850	0.919	1.200	2.500
BOD (mg/L)	10	1.170	0.134	1.000	1.400	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	15	18.000	2.878	13.000	22.000	0	.	.	.	.
Magnesium (mg/L)	15	4.687	0.588	3.800	5.600	0	.	.	.	.
Sodium (mg/L)	15	6.653	1.218	5.100	10.000	0	.	.	.	.
Potassium (mg/L)	15	1.467	0.266	1.200	1.900	0	.	.	.	.
Chloride (mg/L)	16	8.125	1.408	6.000	12.000	0	.	.	.	.
Sulfate (mg/L)	16	13.688	3.135	9.000	20.000	0	.	.	.	.
Silicon (mg/L)	6	4.683	0.773	4.100	6.200	0	.	.	.	.
Fluoride (mg/L)	15	0.088	0.017	0.050	0.100	0	.	.	.	.
Total Iron (ug/L)	15	341.333	81.141	210.000	530.000	0	.	.	.	.
Dissolved Iron (ug/L)	10	49.000	16.633	10.000	70.000	0	.	.	.	.
Total Manganese (ug/L)	15	46.667	11.751	20.000	60.000	0	.	.	.	.
Dissolved Manganese (ug/L)	10	14.000	5.164	10.000	20.000	0	.	.	.	.
Arsenic (ug/L)	10	3.800	1.549	2.000	5.000	0	.	.	.	.
Barium (ug/L)	9	100.000	0.000	100.000	100.000	0	.	.	.	.
Beryllium (ug/L)	9	10.000	0.000	10.000	10.000	0	.	.	.	.
Boron (ug/L)	8	357.500	404.643	60.000	1000.000	0	.	.	.	.
Cadmium (ug/L)	9	2.111	1.269	1.000	4.000	0	.	.	.	.
Chromium (ug/L)	9	8.778	11.333	5.000	39.000	0	.	.	.	.
Cobalt (ug/L)	2	5.000	0.000	5.000	5.000	0	.	.	.	.
Copper (ug/L)	9	32.222	59.325	10.000	190.000	0	.	.	.	.
Lead (ug/L)	9	15.444	14.892	10.000	55.000	0	.	.	.	.
Nickel (ug/L)	9	52.222	6.667	50.000	70.000	0	.	.	.	.
Silver (ug/L)	9	10.000	0.000	0.000	10.000	0	.	.	.	.
Zinc (ug/L)	9	31.111	52.546	10.000	170.000	0	.	.	.	.
Aluminum (ug/L)	9	444.444	296.273	200.000	1100.000	0	.	.	.	.
Selenium (ug/L)	10	1.300	0.483	1.000	2.000	0	.	.	.	.
Mercury (ug/L)	10	0.200	0.000	0.200	0.200	0	.	.	.	.

APPENDIX 4 D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA WINTER, TRM 532.1

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	41	5.380	2.357	2.500	8.500	61	4.851	1.278	2.800	7.000
Dissolved Oxygen (mg/L)	47	10.568	3.541	2.800	13.100	61	11.547	0.760	10.100	12.600
pH (standard units)	29	7.748	0.211	7.400	8.000	61	7.677	0.359	7.100	8.470
Conductivity (umhos/cm)	29	185.862	10.862	170.000	200.000	0	.	.	.	.
Alkalinity (mg/L)	6	56.167	3.545	53.000	60.000	16	55.500	8.610	47.000	69.000
Turbidity (mg/L)	0	.	.	.	.	12	8.233	3.841	4.500	14.000
Organic Nitrogen (mg/L)	6	0.112	0.029	0.070	0.140	16	0.222	0.063	0.130	0.370
Ammonia Nitrogen (mg/L)	6	0.053	0.041	0.010	0.090	16	0.027	0.016	0.010	0.050
Nitrite+Nitrate Nitrogen (mg/L)	6	0.508	0.046	0.460	0.550	16	0.429	0.047	0.340	0.480
Total Phosphorus (mg/L)	6	0.028	0.013	0.010	0.040	12	0.047	0.014	0.030	0.080
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.016	0.015	0.010	0.070
Total Organic Carbon (mg/L)	6	1.900	0.179	1.700	2.100	16	2.475	0.653	1.600	3.600
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	12	1.758	0.928	0.900	3.000
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SPRING, TRM 532.1

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	38	17.768	1.827	12.300	21.700	93	18.343	2.168	13.100	22.900
Dissolved Oxygen (mg/L)	38	8.521	1.266	5.200	10.600	93	8.188	2.761	2.600	11.700
pH (standard units)	33	7.597	0.371	7.000	8.200	93	7.851	0.649	6.800	9.110
Conductivity (umhos/cm)	33	159.697	10.150	140.000	180.000	23	163.696	5.004	147.000	170.000
Alkalinity (mg/L)	6	58.000	5.292	53.000	66.000	16	60.875	8.049	48.000	70.000
Turbidity (mg/L)	0	.	.	.	.	8	3.200	0.612	2.400	3.900
Organic Nitrogen (mg/L)	6	0.135	0.024	0.090	0.160	16	0.351	0.172	0.130	0.650
Ammonia Nitrogen (mg/L)	6	0.035	0.020	0.010	0.070	16	0.036	0.030	0.010	0.140
Nitrite+Nitrate Nitrogen (mg/L)	6	0.285	0.079	0.210	0.370	16	0.207	0.122	0.040	0.410
Total Phosphorus (mg/L)	6	0.022	0.004	0.020	0.030	12	0.027	0.006	0.020	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	12	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	6	2.117	0.337	1.600	2.600	16	2.525	0.800	1.300	4.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	1.687	0.497	1.200	2.200
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - SUMMER, TRM 532.1

Parameter	1973-1977 Preoperational Period					1982-1986 Preoperational Period				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	61	25.254	1.130	23.200	27.800	101	25.876	1.781	22.500	29.100
Dissolved Oxygen (mg/L)	59	4.786	2.580	1.000	9.200	101	6.111	3.361	0.200	12.000
pH (standard units)	41	7.651	0.601	6.800	8.500	101	7.984	1.144	3.000	10.600
Conductivity (umhos/cm)	41	170.488	13.593	130.000	190.000	25	171.400	4.682	165.000	180.000
Alkalinity (mg/L)	7	51.286	3.546	46.000	55.00	12	66.583	6.842	55.000	74.000
Turbidity (mg/L)	0	.	.	.	.	8	2.537	0.798	1.400	3.300
Organic Nitrogen (mg/L)	7	0.150	0.030	0.120	0.210	16	0.332	0.084	0.190	0.470
Ammonia Nitrogen (mg/L)	7	0.021	0.011	0.010	0.040	16	0.016	0.007	0.010	0.030
Nitrite+Nitrate Nitrogen (mg/L)	7	0.176	0.034	0.130	0.220	16	0.056	0.044	0.010	0.130
Total Phosphorus (mg/L)	7	0.021	0.004	0.020	0.030	8	0.026	0.012	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	16	0.010	0.000	0.010	0.010
Total Organic Carbon (mg/L)	7	2.200	0.245	1.800	2.500	16	3.450	0.812	2.200	5.300
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	8	2.562	0.680	1.900	3.400
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 4-D. SEASONAL SUMMARY STATISTICS FOR QUARTERLY WATER QUALITY DATA - AUTUMN, TRM 532.1

	1973-1977 Preoperational Period					1982-1986 Preoperatioal Period				
Parameter	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Temperature (deg C)	56	15.718	1.740	13.300	18.000	60	15.263	2.138	10.500	17.900
Dissolved Oxygen (mg/L)	56	7.987	0.970	6.300	10.000	60	7.792	0.685	6.400	9.000
pH (standard units)	40	7.322	0.112	7.100	7.500	60	7.310	0.292	6.600	8.200
Conductivity (umhos/cm)	40	179.000	3.038	170.000	180.000	16	199.063	3.750	185.000	200.000
Alkalinity (mg/L)	6	51.333	2.338	50.000	56.000	16	63.563	3.596	59.000	71.000
Turbidity (mg/L)	0	.	.	.	.	7	4.829	2.668	1.600	7.800
Organic Nitrogen (mg/L)	6	0.108	0.033	0.070	0.150	15	0.189	0.075	0.110	0.360
Ammonia Nitrogen (mg/L)	6	0.087	0.076	0.010	0.210	15	0.029	0.018	0.010	0.070
Nitrite+Nitrate Nitrogen (mg/L)	6	0.337	0.060	0.290	0.440	15	0.278	0.041	0.240	0.370
Total Phosphorus (mg/L)	6	0.033	0.012	0.020	0.050	7	0.023	0.013	0.010	0.040
Dissolved Phosphorus (mg/L)	0	.	.	.	.	15	0.014	0.005	0.010	0.020
Total Organic Carbon (mg/L)	6	2.183	0.512	1.600	3.100	15	2.813	0.741	1.500	4.000
Dissolved Organic Carbon (mg/L)	0	.	.	.	.	7	2.186	0.965	1.100	3.200
BOD (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Residue (mg/L)	0	.	.	.	.	0	.	.	.	.
Calcium (mg/L)	0	.	.	.	.	0	.	.	.	.
Magnesium (mg/L)	0	.	.	.	.	0	.	.	.	.
Sodium (mg/L)	0	.	.	.	.	0	.	.	.	.
Potassium (mg/L)	0	.	.	.	.	0	.	.	.	.
Chloride (mg/L)	0	.	.	.	.	0	.	.	.	.
Sulfate (mg/L)	0	.	.	.	.	0	.	.	.	.
Silicon (mg/L)	0	.	.	.	.	0	.	.	.	.
Fluoride (mg/L)	0	.	.	.	.	0	.	.	.	.
Total Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Iron (ug/L)	0	.	.	.	.	0	.	.	.	.
Total Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Dissolved Manganese (ug/L)	0	.	.	.	.	0	.	.	.	.
Arsenic (ug/L)	0	.	.	.	.	0	.	.	.	.
Barium (ug/L)	0	.	.	.	.	0	.	.	.	.
Beryllium (ug/L)	0	.	.	.	.	0	.	.	.	.
Boron (ug/L)	0	.	.	.	.	0	.	.	.	.
Cadmium (ug/L)	0	.	.	.	.	0	.	.	.	.
Chromium (ug/L)	0	.	.	.	.	0	.	.	.	.
Cobalt (ug/L)	0	.	.	.	.	0	.	.	.	.
Copper (ug/L)	0	.	.	.	.	0	.	.	.	.
Lead (ug/L)	0	.	.	.	.	0	.	.	.	.
Nickel (ug/L)	0	.	.	.	.	0	.	.	.	.
Silver (ug/L)	0	.	.	.	.	0	.	.	.	.
Zinc (ug/L)	0	.	.	.	.	0	.	.	.	.
Aluminum (ug/L)	0	.	.	.	.	0	.	.	.	.
Selenium (ug/L)	0	.	.	.	.	0	.	.	.	.
Mercury (ug/L)	0	.	.	.	.	0	.	.	.	.

APPENDIX 5-A

SIMILARITY OF PHYTOPLANKTON COMMUNITY STRUCTURE DURING PREOPERATIONAL MONITORING (1973-1977 AND 1982-1986) BASED ON SORENSEN'S QUOTIENT OF SIMILARITY, WATTS BAR NUCLEAR PLANT

Appendix 5-A. Similarity of Phytoplankton Community Structure During Preoperational Monitoring (1973-1977 and 1982-1985) Based on Sorensen's Quotient of Similarity, Watts Bar Nuclear Plant

NUMBER 1 IS 7302

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	46.15	100.00					
3	50.00	84.21	100.00				
4	54.55	83.33	88.24	100.00			
5	48.00	76.92	75.68	68.57	100.00		
6	52.17	81.08	85.71	84.85	83.33	100.00	
7	62.50	66.67	64.29	69.23	68.97	74.07	100.00

NUMBER 2 IS 7305

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	80.00	100.00					
3	68.57	68.75	100.00				
4	75.00	75.86	68.97	100.00			
5	78.79	73.33	60.00	74.07	100.00		
6	77.78	72.73	72.73	66.67	70.97	100.00	
7	68.42	68.57	80.00	75.00	72.73	77.78	100.00

NUMBER 3 IS 7308

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	88.00	100.00					
3	87.27	91.23	100.00				
4	83.64	91.23	90.32	100.00			
5	83.64	87.72	87.10	90.32	100.00		
6	83.64	87.72	90.32	93.55	90.32	100.00	
7	74.58	85.25	87.88	87.88	84.85	87.88	100.00

Appendix 5-A. (Continued)

NUMBER 4 IS 7311

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	77.42	100.00					
3	66.67	64.29	100.00				
4	70.59	62.07	77.42	100.00			
5	66.67	58.82	72.22	75.68	100.00		
6	75.00	68.57	75.68	68.42	79.07	100.00	
7	64.86	62.50	76.47	74.29	75.00	63.41	100.00

NUMBER 5 IS 7402

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	71.43	100.00					
3	74.07	74.07	100.00				
4	64.29	85.71	66.67	100.00			
5	62.07	82.76	78.57	82.76	100.00		
6	66.67	80.00	68.97	73.33	77.42	100.00	
7	75.86	89.66	71.43	75.86	80.00	77.42	100.00

NUMBER 6 IS 7405

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	63.16	100.00					
3	57.14	70.59	100.00				
4	65.22	63.16	76.19	100.00			
5	68.09	61.54	79.07	80.85	100.00		
6	70.00	75.00	72.22	75.00	78.05	100.00	
7	57.78	59.46	68.29	66.67	78.26	61.54	100.00

Appendix 5-A. (Continued)

NUMBER 7 IS 7408

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	56.41	100.00					
3	61.54	64.71	100.00				
4	63.41	66.67	66.67	100.00			
5	69.57	63.41	68.29	74.42	100.00		
6	58.54	55.56	61.11	68.42	69.77	100.00	
7	70.59	52.17	60.87	70.83	71.70	66.67	100.00

NUMBER 8 IS 7411

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	60.00	100.00					
3	66.67	73.68	100.00				
4	64.29	61.54	66.67	100.00			
5	64.29	61.54	59.26	82.35	100.00		
6	76.92	66.67	64.00	81.25	81.25	100.00	
7	66.67	72.00	69.23	84.85	78.79	77.42	100.00

NUMBER 9 IS 7502

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	59.46	100.00					
3	54.55	77.78	100.00				
4	66.67	77.78	81.25	100.00			
5	51.43	63.16	76.47	70.59	100.00		
6	51.61	70.59	73.33	80.00	68.75	100.00	
7	64.52	70.59	66.67	80.00	56.25	64.29	100.00

Appendix 5-A. (Continued)

NUMBER 10 IS 7505

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	51.28	100.00					
3	61.90	59.46	100.00				
4	68.18	66.67	61.90	100.00			
5	69.39	68.18	59.57	81.63	100.00		
6	69.57	63.41	68.18	73.91	74.51	100.00	
7	52.00	62.22	54.17	68.00	76.36	69.23	100.00

NUMBER 11 IS 7508

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	74.36	100.00					
3	74.36	82.86	100.00				
4	72.00	74.63	77.61	100.00			
5	72.73	82.50	82.50	72.73	100.00		
6	74.36	85.71	82.86	77.61	85.00	100.00	
7	68.18	80.00	80.00	75.32	84.44	82.50	100.00

NUMBER 12 IS 7511

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	47.62	100.00					
3	60.47	68.09	100.00				
4	61.22	71.70	70.37	100.00			
5	68.29	71.11	91.30	73.08	100.00		
6	66.67	61.22	80.00	78.57	79.17	100.00	
7	64.00	62.96	76.36	75.41	75.47	73.68	100.00

Appendix 5-A. (Continued)

NUMBER 13 IS 7602

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	66.67	100.00					
3	66.67	72.41	100.00				
4	67.74	76.67	73.33	100.00			
5	65.57	64.41	67.80	72.13	100.00		
6	69.84	72.13	62.30	69.84	70.97	100.00	
7	70.97	73.33	66.67	80.65	72.13	79.37	100.00

NUMBER 14 IS 7605

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	48.98	100.00					
3	36.36	60.87	100.00				
4	48.00	68.97	58.33	100.00			
5	54.90	60.00	72.00	64.52	100.00		
6	41.67	59.26	72.73	71.43	75.86	100.00	
7	50.00	58.06	69.23	56.25	60.61	60.00	100.00

NUMBER 15 IS 7608

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	75.93	100.00					
3	74.29	81.19	100.00				
4	77.78	80.77	85.15	100.00			
5	79.25	80.39	80.81	86.27	100.00		
6	78.43	83.67	90.53	87.76	87.50	100.00	
7	78.50	83.50	84.00	95.15	89.11	90.72	100.00

Appendix 5-A. (Continued)

NUMBER 16 IS 7611

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	41.03	100.00					
3	50.00	64.52	100.00				
4	47.83	66.67	63.16	100.00			
5	52.17	54.55	68.42	60.00	100.00		
6	53.33	62.50	75.68	66.67	76.92	100.00	
7	55.32	58.82	61.54	73.17	73.17	65.00	100.00

NUMBER 17 IS 7702

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	81.25	100.00					
3	77.42	83.33	100.00				
4	67.74	76.67	75.86	100.00			
5	76.67	75.86	78.57	71.43	100.00		
6	69.70	81.25	77.42	70.97	73.33	100.00	
7	75.41	71.19	77.19	66.67	80.00	72.13	100.00

NUMBER 18 IS 7705

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	55.74	100.00					
3	48.15	57.14	100.00				
4	44.44	51.43	78.57	100.00			
5	46.43	59.46	73.33	86.67	100.00		
6	41.51	52.94	74.07	81.48	75.86	100.00	
7	46.15	54.55	69.23	69.23	64.29	80.00	100.00

Appendix 5-A. (Continued)

NUMBER 19 IS 7708

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	86.00	100.00					
3	86.21	77.78	100.00				
4	83.93	82.69	88.33	100.00			
5	81.55	84.21	81.08	89.72	100.00		
6	88.68	85.71	87.72	87.27	85.15	100.00	
7	83.67	86.67	79.25	82.35	90.32	81.25	100.00

NUMBER 20 IS 7711

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	72.00	100.00					
3	75.47	79.25	100.00				
4	68.97	65.52	72.13	100.00			
5	70.97	67.74	80.00	74.29	100.00		
6	69.39	69.39	73.08	66.67	68.85	100.00	
7	69.84	73.02	72.73	73.24	80.00	70.97	100.00?

1984

NUMBER 21 IS 8205

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	61.29	100.00					
3	66.67	66.67	100.00				
4	65.57	81.63	80.00	100.00			
5	64.41	72.34	70.83	78.26	100.00		
6	50.91	69.77	72.73	71.43	75.00	100.00	
7	62.30	69.39	76.00	70.83	69.57	61.90	100.00

Appendix 5-A. (Continued)

NUMBER 22 IS 8208

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	82.11	100.00					
3	84.62	81.32	100.00				
4	83.50	84.44	84.85	100.00			
5	83.02	81.72	86.27	87.13	100.00		
6	89.52	82.61	85.15	84.00	85.44	100.00	
7	78.72	81.48	77.78	78.65	80.43	83.52	100.00

NUMBER 23 IS 8211

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	76.32	100.00					
3	71.23	78.87	100.00				
4	70.89	70.13	78.38	100.00			
5	66.67	71.43	77.61	79.45	100.00		
6	73.42	77.92	75.68	87.50	73.97	100.00	
7	71.60	70.89	71.05	90.24	77.33	87.80	100.00

NUMBER 24 IS 8302

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	87.72	100.00					
3	83.33	91.80	100.00				
4	79.31	88.14	90.32	100.00			
5	82.76	88.14	90.32	90.00	100.00		
6	78.57	87.72	86.67	86.21	86.21	100.00	
7	75.86	81.36	80.65	80.00	86.67	79.31	100.00

Appendix 5-A. (Continued)

NUMBER 25 IS 8305

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	80.00	100.00					
3	74.63	65.67	100.00				
4	73.85	64.62	80.49	100.00			
5	71.64	68.66	80.95	85.37	100.00		
6	73.85	67.69	78.05	87.50	85.37	100.00	
7	68.57	65.71	75.86	87.06	85.06	82.35	100.00

NUMBER 26 IS 8308

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	87.36	100.00					
3	88.89	89.16	100.00				
4	95.74	87.36	88.89	100.00			
5	91.30	84.71	90.91	93.48	100.00		
6	88.42	86.36	85.71	90.53	90.32	100.00	
7	87.23	82.76	86.67	85.11	89.13	82.11	100.00

NUMBER 27 IS 8311

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	62.50	100.00					
3	48.65	62.22	100.00				
4	57.14	65.12	70.83	100.00			
5	52.94	52.38	59.57	62.22	100.00		
6	64.71	66.67	68.09	71.11	59.09	100.00	
7	57.14	55.81	66.67	56.52	66.67	66.67	100.00

Appendix 5-A. (Continued)

1984

NUMBER 28 IS 8405

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	60.00	100.00					
3	68.57	64.52	100.00				
4	66.67	61.54	70.97	100.00			
5	64.52	66.67	68.75	74.07	100.00		
6	50.00	64.29	60.61	64.29	82.76	100.00	
7	68.57	58.06	77.78	77.42	68.75	66.67	100.00

NUMBER 29 IS 8408

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	91.67	100.00					
3	84.00	86.00	100.00				
4	80.81	84.85	85.44	100.00			
5	77.08	79.17	82.00	88.89	100.00		
6	83.87	83.87	88.66	87.50	90.32	100.00	
7	80.00	82.11	90.91	89.80	88.42	91.30	100.00

NUMBER 30 IS 8411

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	78.79	100.00					
3	76.19	66.67	100.00				
4	66.67	80.00	66.67	100.00			
5	58.82	64.52	60.00	70.97	100.00		
6	64.86	64.71	69.77	70.59	62.86	100.00	
7	64.71	64.52	70.00	70.97	68.75	80.00	100.00

Appendix 5-A. (Continued)

NUMBER 31 IS 8502
SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	89.36	100.00					
3	80.00	85.71	100.00				
4	65.31	69.57	68.18	100.00			
5	81.82	87.80	82.05	79.07	100.00		
6	74.42	80.00	78.95	76.19	81.08	100.00	
7	81.63	82.61	77.27	70.83	83.72	76.19	100.00

NUMBER 32 IS 8505
SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	89.11	100.00					
3	79.12	83.33	100.00				
4	74.16	75.61	86.11	100.00			
5	77.78	79.52	90.41	87.32	100.00		
6	78.65	80.49	88.89	85.71	92.96	100.00	
7	82.61	80.00	80.00	79.45	86.49	90.41	100.00

NUMBER 33 IS 8508
SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	91.89	100.00					
3	91.23	90.43	100.00				
4	91.38	88.89	96.67	100.00			
5	92.17	89.66	95.80	97.52	100.00		
6	89.08	88.33	92.68	96.00	95.16	100.00	
7	87.39	85.00	92.68	96.00	93.55	93.75	100.00

Appendix 5-A. (Continued)

NUMBER 34 IS 8511

SORENSENS QUOTIENT OF SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	72.73	100.00					
3	76.36	79.25	100.00				
4	79.25	78.43	80.65	100.00			
5	69.09	71.70	81.25	80.65	100.00		
6	72.41	71.43	80.60	83.08	80.60	100.00	
7	76.36	75.47	90.63	83.87	81.25	86.57	100.00?

APPENDIX 5-B

SIMILARITY OF PHYTOPLANKTON COMMUNITY STRUCTURE DURING PREOPERATIONAL MONITORING (1973-1977 AND 1982-1985) BASED ON PERCENTAGE SIMILARITY, WATTS BAR NUCLEAR PLANT

Appendix 5-B. Similarity of Phytoplankton Community Structure During Preoperational Monitoring (1973-1977 and 1982-1986) Based on Percentage Similarity, Watts Bar Nuclear Plant

NUMBER 1 IS 7302

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	73.72	100.00					
3	75.26	92.47	100.00				
4	72.31	74.70	76.98	100.00			
5	70.95	72.99	78.46	87.55	100.00		
6	73.76	79.29	84.72	82.88	87.14	100.00	
7	54.03	54.35	61.05	71.41	76.98	70.72	100.00

NUMBER 2 IS 7305

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	76.64	100.00					
3	69.98	72.64	100.00				
4	52.95	52.71	67.63	100.00			
5	62.20	60.67	79.38	84.06	100.00		
6	58.71	60.67	78.98	85.76	89.65	100.00	
7	43.87	38.68	56.25	75.18	68.04	69.70	100.00

NUMBER 3 IS 7308

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	60.96	100.00					
3	44.16	62.83	100.00				
4	37.64	56.47	84.57	100.00			
5	30.04	43.64	73.56	80.94	100.00		
6	34.38	50.71	74.96	82.18	86.26	100.00	
7	27.21	41.51	68.56	76.18	86.39	80.68	100.00

Appendix 5-B. (Continued)

NUMBER 4 IS 7311
PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	75.19	100.00					
3	79.19	67.14	100.00				
4	62.22	48.97	70.35	100.00			
5	53.96	41.30	61.90	74.67	100.00		
6	55.05	42.12	63.09	70.46	85.20	100.00	
7	46.10	36.70	54.58	66.54	77.76	79.58	100.00

NUMBER 5 IS 7402
PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	68.77	100.00					
3	70.04	73.38	100.00				
4	54.71	65.69	59.18	100.00			
5	41.67	51.20	50.73	75.37	100.00		
6	59.24	60.82	65.57	81.12	67.16	100.00	
7	59.61	65.00	61.98	76.06	66.07	80.80	100.00

NUMBER 6 IS 7405
PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	72.30	100.00					
3	64.84	76.18	100.00				
4	60.20	62.04	76.12	100.00			
5	58.85	59.84	72.28	84.14	100.00		
6	55.92	54.14	64.87	85.54	85.80	100.00	
7	45.80	46.86	56.14	68.81	76.87	73.65	100.00

Appendix 5-B. (Continued)

NUMBER 7 IS 7408

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	51.94	100.00					
3	51.51	55.94	100.00				
4	46.37	35.57	49.33	100.00			
5	46.73	33.37	36.50	73.78	100.00		
6	49.14	40.71	57.66	67.92	58.20	100.00	
7	33.82	22.22	24.29	48.86	63.88	44.15	100.00

NUMBER 8 IS 7411

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	67.52	100.00					
3	46.54	59.51	100.00				
4	31.66	39.65	71.85	100.00			
5	31.92	39.11	69.86	89.83	100.00		
6	38.23	44.66	77.09	88.05	84.79	100.00	
7	33.21	39.95	72.12	91.71	86.82	89.63	100.00

NUMBER 9 IS 7502

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	42.61	100.00					
3	49.33	73.86	100.00				
4	63.98	62.32	68.10	100.00			
5	61.25	61.93	72.14	89.01	100.00		
6	69.03	56.53	69.04	83.42	80.87	100.00	
7	48.72	61.36	76.37	68.40	66.21	65.64	100.00

Appendix 5-B. (Continued)

NUMBER 10 IS 7505
PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	67.20	100.00					
3	46.35	54.92	100.00				
4	29.95	33.64	65.34	100.00			
5	29.80	32.35	61.15	86.21	100.00		
6	31.31	35.73	68.40	86.32	89.88	100.00	
7	33.80	35.77	63.77	83.16	81.76	79.41	100.00

NUMBER 11 IS 7508
PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	62.29	100.00					
3	57.77	73.75	100.00				
4	54.35	69.12	60.96	100.00			
5	58.73	65.32	65.96	55.08	100.00		
6	59.74	66.94	57.53	63.18	62.30	100.00	
7	34.99	29.09	29.29	26.96	45.80	31.14	100.00

NUMBER 12 IS 7511
PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	34.54	100.00					
3	32.61	44.54	100.00				
4	34.19	48.58	52.62	100.00			
5	39.74	52.24	65.27	77.03	100.00		
6	41.95	33.17	56.07	73.20	70.81	100.00	
7	40.34	42.22	60.09	68.08	73.86	68.06	100.00

Appendix 5-B. (Continued)

NUMBER 13 IS 7602

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	51.93	100.00					
3	55.55	86.75	100.00				
4	55.67	85.45	89.77	100.00			
5	51.33	90.14	79.32	81.54	100.00		
6	53.24	93.39	82.06	86.43	93.27	100.00	
7	66.63	75.38	83.62	77.23	71.04	72.66	100.00

NUMBER 14 IS 7605

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	27.29	100.00					
3	25.01	49.85	100.00				
4	40.62	44.54	56.03	100.00			
5	45.77	38.88	52.90	76.28	100.00		
6	40.96	32.00	55.46	64.55	74.86	100.00	
7	41.44	33.12	53.04	66.84	77.16	84.14	100.00

NUMBER 15 IS 7608

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	81.59	100.00					
3	77.00	84.65	100.00				
4	70.15	78.83	85.86	100.00			
5	63.59	72.65	78.14	85.64	100.00		
6	65.67	74.31	80.04	87.14	91.93	100.00	
7	47.67	55.63	63.04	70.12	71.36	71.72	100.00

Appendix 5-B. (Continued)

NUMBER 16 IS 7611

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	34.16	100.00					
3	40.13	66.59	100.00				
4	35.27	59.31	80.93	100.00			
5	36.42	42.72	66.10	72.32	100.00		
6	31.73	51.76	70.91	81.56	71.91	100.00	
7	37.67	42.85	64.77	73.98	72.84	76.27	100.00

NUMBER 17 IS 7702

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	68.88	100.00					
3	82.78	77.16	100.00				
4	81.13	79.12	86.01	100.00			
5	84.39	76.39	89.45	89.17	100.00		
6	75.08	78.48	81.65	84.25	85.76	100.00	
7	63.95	54.43	67.76	62.83	66.26	57.65	100.00

NUMBER 18 IS 7705

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	64.03	100.00					
3	59.86	82.85	100.00				
4	52.62	65.94	75.18	100.00			
5	53.85	68.63	76.16	87.67	100.00		
6	57.33	73.62	88.55	82.24	85.37	100.00	
7	47.85	58.26	66.04	84.62	79.58	74.53	100.00

Appendix 5-B. (Continued)

NUMBER 19 IS 7708

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	78.78	100.00					
3	51.08	52.38	100.00				
4	64.37	63.61	67.92	100.00			
5	60.95	70.62	68.61	74.79	100.00		
6	76.39	83.33	63.27	75.69	77.93	100.00	
7	75.52	91.75	48.28	59.09	66.82	78.13	100.00

NUMBER 20 IS 7711

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	60.98	100.00					
3	48.79	62.08	100.00				
4	24.90	31.72	56.19	100.00			
5	24.89	32.17	56.17	86.36	100.00		
6	19.72	18.50	36.59	72.25	68.72	100.00	
7	29.23	38.23	64.37	71.37	74.44	58.92	100.00?

Appendix 5-B. (Continued)

NUMBER 21 IS 8205

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	57.56	100.00					
3	47.77	59.23	100.00				
4	39.08	55.16	67.07	100.00			
5	31.26	42.55	61.03	76.43	100.00		
6	33.33	43.63	65.55	78.86	74.40	100.00	
7	57.11	61.11	72.95	63.95	55.05	56.72	100.00

NUMBER 22 IS 8208

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	63.53	100.00					
3	46.15	54.41	100.00				
4	27.29	30.11	58.96	100.00			
5	24.87	28.28	58.92	92.92	100.00		
6	28.68	33.74	65.04	82.75	85.15	100.00	
7	9.86	8.98	20.83	40.89	41.85	34.35	100.00

NUMBER 23 IS 8211

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	67.93	100.00					
3	58.92	69.52	100.00				
4	44.87	50.36	69.12	100.00			
5	42.23	47.30	68.76	80.98	100.00		
6	37.03	40.69	54.95	73.10	67.98	100.00	
7	33.50	36.23	50.80	73.44	69.88	83.69	100.00

Appendix 5-B. (Continued)

1MONTH NUMBER 24 IS 8302

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	75.88	100.00					
3	75.05	86.93	100.00				
4	80.82	75.67	76.75	100.00			
5	78.75	69.54	70.11	83.75	100.00		
6	74.29	68.14	67.41	82.35	85.83	100.00	
7	66.52	76.62	74.51	74.50	76.64	71.53	100.00

1MONTH NUMBER 25 IS 8305

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	64.99	100.00					
3	34.69	40.85	100.00				
4	29.87	35.76	78.08	100.00			
5	35.90	43.02	79.79	80.31	100.00		
6	33.20	37.66	78.86	83.84	84.62	100.00	
7	14.89	16.29	44.46	51.50	45.41	50.68	100.00

NUMBER 26 IS 8308

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	75.23	100.00					
3	50.19	55.94	100.00				
4	50.63	50.90	78.85	100.00			
5	48.14	49.16	71.90	84.34	100.00		
6	60.54	69.34	69.39	66.33	66.13	100.00	
7	25.67	26.67	51.28	53.84	55.16	35.38	100.00

Appendix 5-B. (Continued)

NUMBER 27 IS 8311

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	45.87	100.00					
3	22.68	37.99	100.00				
4	21.32	41.64	61.33	100.00			
5	28.38	40.16	62.90	59.58	100.00		
6	22.30	39.18	50.44	76.47	59.76	100.00	
7	21.83	34.94	52.58	56.26	62.73	63.04	100.00

NUMBER 28 IS 8402

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	69.22	100.00					
3	70.04	80.39	100.00				
4	61.75	77.52	80.87	100.00			
5	59.69	77.79	78.13	88.65	100.00		
6	63.89	73.70	73.36	74.15	75.64	100.00	
7	64.79	70.68	75.78	78.64	78.47	83.11	100.00

NUMBER 29 IS 8405

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	79.53	100.00					
3	65.15	55.85	100.00				
4	61.98	63.75	81.22	100.00			
5	50.34	49.71	75.64	76.98	100.00		
6	55.25	59.25	79.65	86.39	84.68	100.00	
7	42.78	35.21	60.51	52.07	66.28	58.29	100.00

Appendix 5-B. (Continued)

NUMBER 30 IS 8408

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	75.48	100.00					
3	63.25	76.49	100.00				
4	36.61	50.70	63.20	100.00			
5	50.50	64.71	82.00	78.75	100.00		
6	55.98	71.32	89.28	70.74	89.66	100.00	
7	54.05	66.26	86.42	73.43	90.77	87.06	100.00

NUMBER 31 IS 8411

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	66.29	100.00					
3	29.57	19.56	100.00				
4	65.10	51.29	43.60	100.00			
5	59.05	45.00	45.26	78.82	100.00		
6	53.90	43.26	47.25	75.38	69.45	100.00	
7	54.23	38.83	42.27	75.41	67.05	84.91	100.00?

Appendix 5-B. (Continued)

NUMBER 32 IS 8502

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	81.24	100.00					
3	87.89	85.87	100.00				
4	74.73	78.89	76.64	100.00			
5	79.70	83.88	79.55	83.64	100.00		
6	75.20	65.50	75.12	67.04	76.85	100.00	
7	72.24	80.27	74.71	78.28	73.67	54.33	100.00

NUMBER 33 IS 8505

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	66.51	100.00					
3	32.74	50.51	100.00				
4	28.64	45.09	82.31	100.00			
5	27.31	43.73	85.29	89.49	100.00		
6	27.72	43.95	80.22	90.72	90.86	100.00	
7	50.45	46.03	35.44	40.17	36.92	38.59	100.00

NUMBER 34 IS 8508

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	76.15	100.00					
3	56.10	74.36	100.00				
4	43.81	59.70	82.84	100.00			
5	43.26	59.04	81.69	94.44	100.00		
6	31.80	44.71	63.97	78.26	78.57	100.00	
7	21.75	31.31	47.22	59.99	60.84	77.39	100.00

Appendix 5-B. (Continued)

NUMBER 35 IS 8511

PERCENT SIMILARITY MATRIX

	1	2	3	4	5	6	7
1	100.00						
2	79.21	100.00					
3	79.21	66.94	100.00				
4	60.04	51.09	69.15	100.00			
5	58.49	64.37	68.89	77.57	100.00		
6	61.75	51.51	71.21	90.95	79.17	100.00	
7	64.56	62.87	74.62	80.54	84.76	81.71	100.00?

APPENDIX 5-C

DIVERSITY INDEX VALUES (D BAR)
FOR PHYTOPLANKTON COMMUNITIES DURING PREOPERATIONAL MONITORING
(1973-1977 AND 1982-1985), WATTS BAR NUCLEAR PLANT

Appendix 5-C. Diversity Index Values (D bar) for Phytoplankton Communities During Preoperational Monitoring (1973-1977 and 1982-1985), Watts Bar Nuclear Plant

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1973	0.0	13	2.31	13	2.31	16	2.49	7	1.19	8	1.78	15	2.15	8	1.64
	1.0	5	0.66	12	2.20	11	2.12	12	2.06	8	1.49	12	2.40	4	1.42
	3.0	5	0.53	13	2.48	12	2.30	8	1.98	7	1.67	8	1.84	7	1.47
	5.0	12	2.02	12	2.02	12	1.95	9	1.62	17	2.11	8	1.40	7	1.40
May 1973	0.0	10	2.16	11	2.16	7	1.41	8	1.17	10	1.85	9	1.66	10	2.37
	1.0	11	2.50	6	1.23	9	1.47	7	0.65	9	1.22	7	1.11	14	2.40
	3.0	12	2.62	8	1.35	7	1.38	8	1.02	9	1.16	11	1.24	14	2.33
	5.0	16	2.71	6	0.97	9	1.87	9	1.22	7	1.41	9	0.93	14	2.25
Aug. 1973	0.0	16	3.66	16	3.66	20	3.79	26	3.97	28	4.04	24	3.87	23	3.90
	1.0	17	3.45	20	3.86	21	3.75	25	4.08	24	4.04	25	3.95	30	4.10
	3.0	14	3.20	21	3.86	26	4.08	25	3.89	24	4.00	27	4.04	26	4.07
	5.0	16	3.16	17	3.34	24	3.83	23	3.81	26	4.12	25	3.97	29	4.18
Nov. 1973	0.0	8	2.01	8	2.20	8	1.85	10	2.24	16	2.83	11	2.10	10	2.43
	1.0	8	2.21	6	1.87	8	2.15	9	2.50	13	2.15	14	2.65	12	2.25
	3.0	11	2.41	6	1.71	9	1.98	10	2.09	12	2.36	12	2.49	12	2.21
	5.0	10	2.25	6	1.83	9	2.23	10	1.94	9	2.19	13	2.13	9	1.96

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1974	0.0	9	2.54	9	2.95	7	2.15	9	2.19	10	2.07	10	2.38	10	1.99
	1.0	6	1.96	6	2.02	7	2.03	7	1.58	9	1.46	9	2.31	9	2.26
	3.0	9	2.23	7	1.98	6	1.87	7	1.56	9	1.50	6	1.26	12	2.90
	5.0	7	1.78	6	1.99	9	2.27	9	1.82	10	1.90	10	2.10	9	2.19
May 1974	0.0	17	2.82	10	1.86	10	2.06	14	2.32	14	1.89	14	2.49	13	1.82
	1.0	16	3.23	7	1.39	7	0.91	15	2.30	13	1.98	12	2.30	13	1.83
	3.0	9	2.00	7	1.53	14	2.03	13	1.76	16	2.64	12	2.09	13	1.89
	5.0	16	3.00	9	1.78	13	1.71	13	2.06	11	1.95	12	2.08	14	2.11
Aug. 1974	0.0	9	2.22	11	2.86	4	1.96	11	2.36	10	2.00	12	2.79	14	2.53
	1.0	9	2.13	12	2.91	9	2.06	11	2.31	8	1.38	8	2.10	18	2.72
	3.0	13	2.95	6	1.39	11	2.67	11	2.22	17	2.77	8	2.73	15	2.61
	5.0	12	3.17	8	1.95	7	1.71	9	2.14	13	2.34	8	1.45	20	2.76
Nov. 1974	0.0	9	2.36	3	0.56	5	1.04	5	1.32	7	1.37	9	1.48	6	1.68
	1.0	4	1.24	6	1.62	8	1.57	11	1.90	10	1.70	12	1.78	11	1.93
	3.0	8	2.26	5	0.95	4	1.35	12	2.11	11	2.04	9	1.69	10	1.58
	5.0	5	1.71	3	0.95	6	1.39	10	1.39	8	1.58	10	1.92	12	2.30

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1975	0.0	11	1.83	14	3.45	8	2.24	7	2.03	14	2.74	11	2.43	9	2.36
	1.0	10	2.41	11	2.78	13	2.88	8	2.17	10	2.70	8	1.63	6	1.62
	3.0	9	1.70	9	2.53	11	3.11	9	2.17	8	2.13	12	2.49	11	2.67
	5.0	7	1.24	10	2.72	11	2.79	13	2.67	10	2.23	7	1.97	4	1.46
May 1975	0.0	9	1.80	9	1.80	9	1.29	12	1.26	19	1.89	13	1.81	16	1.60
	1.0	14	2.46	8	0.91	10	0.92	15	1.68	16	1.68	16	1.49	18	1.71
	3.0	11	2.33	5	0.35	9	1.62	14	0.96	14	1.94	15	1.79	13	1.64
	5.0	11	2.10	8	1.51	14	1.74	12	1.53	15	1.70	12	1.51	20	2.06
Aug. 1975	0.0	30	4.12	23	3.66	20	3.32	8	1.73	20	3.34	18	3.03	31	3.72
	1.0	33	3.90	23	3.58	20	3.35	19	3.35	22	3.13	21	3.66	29	3.73
	3.0	34	4.01	18	3.16	15	2.49	18	3.37	29	3.52	25	3.66	39	4.12
	5.0	29	3.26	22	3.48	28	4.08	17	3.34	27	3.87	24	3.66	37	4.23
Nov. 1975	0.0	8	2.77	9	2.74	14	2.56	16	3.11	13	2.64	19	3.38	8	2.42
	1.0	9	2.35	14	1.96	18	3.10	14	2.51	12	2.68	17	3.07	21	3.47
	3.0	11	3.13	12	2.07	7	2.47	20	3.15	7	1.64	10	2.33	12	2.48
	5.0	11	2.91	11	3.01	9	2.25	14	2.65	17	3.43	18	3.00	17	3.17

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1976	0.3	19	1.34	19	1.41	16	1.14	23	0.92	18	1.05	19	1.02	17	1.48
	1.0	24	1.54	19	1.02	17	1.20	11	0.95	21	1.18	20	1.06	19	1.38
	3.0	24	1.75	17	1.28	17	1.38	18	1.09	19	1.35	17	0.75	19	1.33
	5.0	21	1.89	19	0.86	10	0.92	16	0.88	16	0.93	16	1.01	19	1.13
May 1976	0.0	21	3.22	9	2.73	6	1.76	5	1.12	7	2.23	9	2.22	8	2.09
	1.0	20	3.67	6	2.28	4	1.60	10	2.27	7	2.21	11	2.53	9	2.35
	3.0	20	3.55	5	1.48	6	2.05	9	2.21	8	2.08	4	1.58	8	2.34
	5.0	22	3.59	6	1.81	4	1.29	7	1.94	10	2.32	7	1.92	11	2.38
Aug. 1976	0.0	44	3.59	20	2.99	32	2.53	36	3.55	36	3.52	34	3.25	43	3.48
	1.0	26	2.16	30	3.87	39	3.18	37	3.59	37	2.90	35	2.54	40	3.45
	3.0	34	3.36	30	2.57	33	3.50	39	3.47	31	3.04	28	2.41	40	3.75
	5.0	39	2.65	37	2.52	30	3.44	36	2.92	39	3.14	36	3.08	43	3.71
Nov. 1976	0.0	15	2.41	5	1.20	8	0.81	11	1.90	6	1.00	8	1.04	12	2.26
	1.0	11	2.52	6	1.13	8	1.24	9	1.25	12	2.25	13	2.20	12	1.95
	3.0	15	2.63	6	0.84	10	2.20	14	2.13	16	2.04	13	2.21	15	2.16
	5.0	15	2.81	5	0.89	6	0.91	9	1.32	13	2.51	8	1.33	10	1.41

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1977	0.0	25	2.61	24	2.71	20	2.58	22	2.64	21	2.63	24	2.35	23	3.23
	1.0	20	2.47	17	2.23	21	2.78	19	2.46	16	2.41	21	2.21	18	3.20
	3.0	23	2.46	15	2.31	16	2.05	14	1.86	15	2.20	19	2.22	15	2.87
	5.0	20	1.82	16	2.29	18	2.33	17	2.16	19	2.47	20	2.52	11	2.64
May 1977	0.0	24	3.45	13	1.83	7	1.39	8	1.62	6	1.22	7	1.85	11	1.90
	1.0	26	3.76	8	1.91	7	1.54	8	1.45	11	2.19	9	1.51	7	1.75
	3.0	22	2.80	10	1.62	6	1.16	7	1.36	10	1.83	6	1.49	6	1.45
	5.0	20	3.29	8	1.08	12	1.93	8	1.13	5	1.18	9	1.43	7	1.30
Aug. 1977	0.0	36	3.34	38	3.68	40	3.97	41	3.77	37	3.34	34	2.61	34	2.83
	1.0	38	3.67	30	2.33	51	4.21	43	3.58	37	3.34	44	3.75	29	3.68
	3.0	37	3.12	31	2.69	42	4.04	46	3.60	38	2.90	39	3.16	31	2.61
	5.0	30	3.17	32	3.01	45	3.77	39	3.67	41	3.10	37	3.37	30	2.37
Nov. 1977	0.0	13	2.25	13	2.25	18	2.83	21	2.45	25	3.03	24	2.81	28	3.38
	1.0	19	3.42	17	2.49	21	2.62	24	3.03	28	2.80			29	3.69
	3.0	18	3.33	12	2.67	16	2.74	23	2.92	20	2.89			24	2.90
	5.0	16	3.19	19	3.26	20	3.03	22	1.84	24	2.56			1	-.00

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
May 1982	0.3	27	3.13	19	3.11	17	2.84	19	3.00	19	3.04	17	2.74	17	3.05
	1.0	29	3.08	17	2.33	19	2.94	18	2.80	15	2.58	14	2.61	16	2.99
	3.0	25	3.12	18	2.45	19	2.92	12	2.58	15	2.77	17	2.58	16	2.94
	5.0	22	3.55	14	1.95	15	1.94	18	3.03	14	2.31	14	2.50	17	2.67
Aug. 1982	0.3	39	3.45	30	3.33	41	3.10	33	1.81	34	1.94	34	2.33	20	1.03
	1.0	35	3.21	28	3.29	37	3.06	34	1.70	37	2.05	34	2.36	29	1.07
	3.0	38	3.00	34	3.36	40	2.88	39	2.18	37	2.03	34	2.01	27	1.12
	5.0	29	3.03	33	3.46	37	3.08	40	2.30	37	1.99	31	1.70	29	2.26
Nov. 1982	0.3	21	2.93	24	2.82	25	3.09	23	2.88	21	3.02	25	3.02	26	2.92
	1.0	26	2.99	23	2.72	23	2.77	25	3.10	24	3.28	22	2.63	22	2.82
	3.0	19	3.00	24	3.11	24	2.92	24	3.14	24	3.14	29	2.89	25	2.91
	5.0	22	2.91	19	2.57	23	3.16	28	3.28	22	2.92	24	3.05	28	2.78

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1983	0.3	21	3.02	24	3.26	23	3.33	21	3.39	21	3.29	21	3.09	23	3.35
	1.0	20	3.17	22	2.98	23	3.05	17	2.73	21	3.28	23	3.35	21	3.14
	3.0	21	3.25	21	2.96	21	2.67	25	3.47	20	3.10	20	3.40	18	3.39
	5.0	21	3.35	22	2.98	21	3.38	21	2.90	20	3.37	21	3.43	19	2.97
May 1983	0.3	16	2.45	16	2.63	26	2.63	32	2.64	31	2.66	33	3.21	30	3.17
	1.0	17	2.41	19	2.73	25	2.47	28	2.82	34	2.91	29	3.01	35	3.03
	3.0	20	2.53	18	2.48	27	2.60	31	2.68	30	2.72	32	2.88	34	2.82
	5.0	17	2.39	17	2.62	28	2.85	28	2.77	30	2.83	30	2.57	35	2.75
Aug. 1983	0.3	31	3.33	36	3.24	38	2.94	36	3.09	32	2.83	35	2.83	38	2.33
	1.0	33	3.68	25	2.75	34	3.05	37	2.88	38	2.59	34	2.10	38	2.40
	3.0	35	3.74	24	3.18	35	2.94	34	2.84	36	2.90	38	3.39	36	2.27
	5.0	36	3.35	32	2.92	37	3.38	37	2.93	37	2.80	32	3.15	39	2.35
Nov. 1983	0.3	10	2.43	11	2.21	21	3.17	12	2.34	14	1.84	16	2.07	16	3.15
	1.0	13	2.91	14	2.85	15	2.59	16	2.99	14	2.32	15	2.33	14	2.65
	3.0	11	2.66	14	2.74	11	2.18	14	1.96	13	2.39	15	2.89	18	3.10
	5.0	10	2.22	15	3.02	15	2.48	15	2.85	15	2.99	12	2.25	18	2.96

Appendix 5-C. (Continued)

Date	Depth(m)	Tennessee River Mile 496.5 No. Taxa	496.5 Dbar	506.6 No. Taxa	506.6 Dbar	518.0 No. Taxa	518.0 Dbar	527.4 No. Taxa	527.4 Dbar	528.0 No. Taxa	528.0 Dbar	529.5 No. Taxa	529.5 Dbar	532.1 No. Taxa	532.1 Dbar
Feb. 1984	0.3	21	3.14	33	3.62	27	3.11	36	3.78	34	3.42	36	3.62	34	3.90
	1.0	27	3.45	32	3.73	32	3.35	36	3.89	41	3.82	32	3.53	34	3.68
	3.0	27	3.26	31	3.42	30	3.21	32	3.58	34	4.01	38	3.94	35	3.81
	5.0	36	3.69	30	3.36	37	3.62	29	3.23	39	3.80	29	3.75	40	4.01
May 1984	0.3	13	2.21	10	1.69	16	1.88	12	1.24	17	1.30	15	0.92	13	1.62
	1.0	12	1.98	12	0.97	15	2.25	14	1.49	12	0.95	14	1.58	14	1.49
	3.0	14	2.45	10	0.75	14	1.82	9	0.67	12	1.25	11	0.70	18	1.94
	5.0	11	1.42	11	1.07	15	2.16	10	1.25	11	1.46	11	0.88	16	1.91
Aug. 1984	0.3	39	3.52	37	3.69	37	2.90	40	2.72	39	2.90	36	2.85	32	2.58
	1.0	37	3.42	38	3.40	40	2.89	42	3.07	38	2.87	42	3.12	33	3.07
	3.0	39	3.63	41	3.31	32	3.08	38	2.88	39	2.85	40	3.04	37	3.12
	5.0	35	3.40	43	3.53	37	3.21	41	2.86	43	2.88	32	2.97	43	3.21
Nov. 1984	0.3	14	2.56	13	2.52	19	3.16	11	2.32	14	2.59	15	2.75	14	2.43
	1.0	12	2.73	9	1.91	19	1.53	10	2.29	13	2.90	15	2.46	14	2.50
	3.0	15	2.75	11	2.26	14	2.43	13	2.66	12	2.38	11	2.34	13	2.40
	5.0	11	2.40	14	2.93	13	2.61	14	2.68	12	2.25	13	2.35	13	2.27

Appendix 5-C. (Continued)

		Tennessee River Mile													
		496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	Depth(m)	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar	No. Taxa	Dbar
Feb. 1985	0.3	22	3.30	21	2.98	17	2.70	19	2.29	18	2.67	14	2.38	22	3.14
	1.0	19	2.65	21	3.06	18	3.05	17	2.56	17	2.41	16	2.46	18	3.05
	3.0	21	3.28	18	2.77			20	2.78	17	2.37	14	2.20	19	2.76
	5.0	24	3.00	19	3.22	19	2.70	17	2.25	17	2.79	16	2.02	21	2.83
May 1985	0.3	37	3.42	37	3.77	32	3.68	28	3.01	35	3.47	29	3.10	32	2.24
	1.0	46	3.86	39	3.59	26	3.68	25	2.76	23	2.75	24	2.96	28	2.09
	3.0	50	3.68	41	3.95	29	3.47	29	3.26	30	3.25	22	2.65	28	2.12
	5.0	39	3.19	39	3.90	24	3.36	28	3.23	22	3.05	28	2.81	29	2.19
Aug. 1985	0.3	40	3.80	48	3.43	51	3.93	57	3.91	52	3.86	54	3.21	55	3.74
	1.0	46	3.87	48	3.78	51	3.93	58	3.93	53	4.06	57	3.61	54	3.43
	3.0	40	4.25	40	3.72	53	3.97	56	3.85	53	4.04	58	3.76	59	3.62
	5.0	47	4.40	40	3.69	51	4.05	55	3.54	56	3.69	56	3.55	58	3.34
Nov. 1985	0.3	15	2.22	14	1.96	25	2.58	24	3.08	23	2.91	26	2.92	21	2.50
	1.0	17	1.95	16	2.33	18	2.31	20	2.67	20	2.89	25	3.01	21	2.86
	3.0	17	2.07	15	2.16	20	2.35	22	2.79	23	2.82	22	3.17	23	2.77
	5.0	15	1.89	16	2.46	16	2.34	20	2.83	21	2.91	23	3.00	23	3.19

APPENDIX 5-D

**TOTAL PHYTOPLANKTON DENSITIES (NO. X 100)
AT EACH SAMPLE STATION (YEARS, QUARTERS AND DEPTHS COMBINED)
DURING PREOPERATIONAL MONITORING (1973-1977 AND 1982-1985)
WATTS BAR NUCLEAR PLANT**

Appendix 5-D. Total Phytoplankton Densities (No. x 100) at Each Sample Station (Years, Quarters and Depths Combined) During Preoperational Monitoring (1973-1977 and 1982-1985), Watts Bar Nuclear Plant

	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Chlorophyta							
Acanthosphaera	295	218	683	572	427	290	726
Actinastrum	7959	5624	6702	8495	7900	7858	8978
Ankistrodesmus	18679	16522	17693	16563	17171	19549	32971
Arthrodesmus	0	33	0	0	0	0	119
Botryococcus	8287	1813	2138	4904	5023	1816	6092
Bracteacoccus	0	198	0	0	0	0	0
Carteria	347	310	1723	489	496	408	340
Characium	27	36	0	36	0	0	66
Chlamydomonas	16805	14838	22500	19762	20409	16076	25440
Chlorella	28409	79368	64510	44974	45492	52795	45804
Chlorococcum	623	263	343	768	636	1301	1899
Chlorogonium	95	344	2005	630	506	442	377
Chodatella	3261	2852	2524	3133	3267	2896	2953
Cladophora	1006	31	0	0	0	0	0
Closteridium	0	32	31	0	0	0	32
Closteriopsis	286	31	242	42	136	147	128
Closterium	9	62	0	31	176	28	491
Coelastrum	15251	17426	36572	27839	32243	26843	54652
Cosmarium	282	104	156	268	235	93	315
Crucigenia	11136	13190	13223	18329	15967	16675	23046
Dactylococcus	66	166	384	0	481	657	394
Dictyosphaerium	16756	14244	12553	10641	14356	14152	30245
Echinosphaerella	41	0	0	0	10	0	0
Elakatothrix	501	258	594	1435	708	499	1484
Euastrum	291	193	422	564	293	241	510
Eudorina	2048	2436	3932	5348	7057	1723	6255

Appendix 5-D. (Continued)

Franceia	487	655	1449	1220	1081	671	1492
Gloeoactinium	3001	4633	10628	7433	13600	8653	21607
Gloeocystis	97	62	263	0	0	526	0
Golenkinia	6142	4829	10860	8878	9150	6691	11633
Gonium	2892	8317	5454	5171	3899	2923	5289
Hyalotheca	187	0	0	0	0	0	0
Kirchneriella	11439	14942	23903	20886	14219	13045	29855
Micractinium	8379	5598	8863	9245	10133	11729	16661
Micrasterias	32	0	64	32	64	0	32
Mougeotia	419	646	490	1759	3104	2514	3697
Oocystis	4032	5068	6348	7097	6522	5362	15522
Pandorina	10394	7989	13585	15356	15326	14500	38645
Pediastrum	14894	12810	16135	20685	18727	18018	27928
Planktosphaeria	2428	2268	3427	4657	5356	4066	3983
Platydorina	0	0	0	1986	1052	0	2630

Appendix 5-D. (Continued)

	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
<u>Pleodorina</u>	0	0	1052	0	3156	1052	4207
<u>Polyedriopsis</u>	21	0	0	0	0	0	0
<u>Protococcus</u>	2506	3991	2585	3146	3924	1495	4662
<u>Pteromonas</u>	629	368	654	1057	771	856	782
<u>Pyramimonas</u>	159	0	1715	0	93	0	0
<u>Quadrigula</u>	244	500	519	189	822	299	846
<u>Scenedesmus</u>	81703	77107	131022	118094	113497	117868	156254
<u>Schroederia</u>	2574	4086	3664	3127	3706	2673	7511
<u>Selenastrum</u>	32	125	0	603	0	0	0
<u>Spermatozoopsis</u>	0	0	9	0	0	0	0
<u>Sphaerocystis</u>	32	572	961	826	394	295	1544
<u>Spirogyra</u>	0	0	0	0	0	114	0
<u>Spondylosium</u>	50	222	1147	724	294	184	222
<u>Staurastrum</u>	713	1045	1314	2064	2509	2522	3578
<u>Stigeoclonium</u>	0	286	0	95	127	32	0
<u>Tetradesmus</u>	0	0	0	0	131	0	0
<u>Tetraedron</u>	3022	4843	13728	8165	8375	6312	15629
<u>Tetraspora</u>	657	657	723	263	1446	1052	1052
<u>Tetrastrum</u>	470	611	1046	2806	1814	854	2165
<u>Treubaria</u>	1590	998	2537	2731	2403	1896	3990
<u>Trochiscia</u>	1620	918	886	1650	569	826	953
<u>Ulothrix</u>	657	6015	3977	2137	2352	2519	920
Chrysophyta							
<u>Achnanthes</u>	5031	4961	8266	9195	8032	6352	13673
<u>Asterionella</u>	31254	33500	39723	45652	57640	57183	61052
<u>Attheya</u>	1121	780	270	446	301	508	394
<u>Caloneis</u>	0	0	0	1089	322	0	0
<u>Chaetoceros</u>	11560	14176	15635	15987	16301	16024	20127
<u>Cocconeis</u>	706	589	161	472	339	431	2372

Appendix 5-D. (Continued)

Cyclotella	10522	11638	17059	19317	20286	20194	32075
Cymatopleura	0	0	0	10	0	21	0
Cymbella	1162	884	1043	1043	728	947	863
Diatoma	406	176	333	455	446	344	304
Dichotomococcus	0	0	0	31	0	0	0
Dinobryon	28097	35239	12485	12249	13959	10616	15485
Eunotia	206	1479	1348	1381	2400	1748	460
Fragilaria	6130	26629	25999	45271	36679	46542	124251
Gomphonema	426	144	132	218	156	309	292
Gyrosigma	40	31	42	10	10	64	21
Mallomonas	17079	651	518	225	525	532	14957
Melosira	301148	356166	410871	526966	536807	524779	542789
Meridion	259	0	21	0	0	0	0

Appendix 5-D. (Continued)

	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Navicula	4419	4271	3969	3267	3566	3555	2787
Nitzschia	2310	882	1377	1286	1230	1996	1224
Ophiocytium	9	0	0	0	18	0	64
Pinnularia	0	33	0	66	0	0	0
Pleurosigma	0	0	33	10	33	0	109
Rhizosolenia	2491	2701	4336	6263	5498	4486	7772
Rhoicosphenia	54	695	216	0	43	66	86
Stephanodiscus	21872	25457	20476	18984	23363	22754	28560
Surirella	1104	163	230	248	426	197	164
Synedra	34702	33961	64452	75030	76663	73682	105559
Synura	2531	4660	3869	3872	3885	4149	5145
Tabellaria	1406	1369	1307	1625	1945	626	1464
Cryptophyta							
Chroomonas	25623	15345	11498	11357	10398	11047	17566
Cryptomonas	12451	11878	9625	11841	11377	11286	17374
Cyanophyta							
Anabaena	2001	3800	4717	5218	13528	5954	21277
Anabaenopsis	0	2728	218	10052	0	156	0
Anacystis	176754	192306	225153	244471	335882	264901	363147
Aphanizomenon	0	799	64	32	0	0	2521
Aphanocapsa	7227	178	3714	1071	3390	2697	5409
Aphanothece	984	589	1153	2962	1760	1884	9193
Calothrix	97	0	0	0	0	0	0
Chroococcus	4448	4290	9525	6580	5978	3171	30837
Coelosphaerium	1048	0	0	0	0	0	0

Appendix 5-D. (Continued)

<u>Cylindrospermum</u>	64	0	0	164	493	164	460
<u>Dactylococcopsis</u>	16423	20303	24267	29902	35793	33116	39903
<u>Eucapsis</u>	3235	0	16800	0	1052	156	1249
<u>Gloeothece</u>	1391	0	405	1886	7670	2217	42644
<u>Gomphosphaeria</u>	0	0	526	0	0	0	1052
<u>Lyngbya</u>	5570	16578	30719	34805	36904	51776	79785
<u>Merismopedia</u>	97803	64213	121221	120077	123003	101367	168697
<u>Microcystis</u>	0	0	0	986	8448	8316	8743
<u>Oscillatoria</u>	192299	160533	180268	275418	235622	258834	485697
<u>Oscillatoria (spiral)</u>	0	2490	0	31	446	187	31
<u>Phormidium</u>	197	2860	4635	5827	9269	7889	8645
<u>Raphidiopsis</u>	29707	56646	201477	381487	371854	251744	1081E3

Appendix 5-D. (Continued)

	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Euglenophyta							
<u>Cryptoglena</u>	253	358	337	388	568	137	623
<u>Euglena</u>	7468	3581	6934	7744	6523	9107	13241
<u>Phacus</u>	41	52	165	554	483	437	267
<u>Trachelomonas</u>	6026	3807	6445	8086	8229	6968	14037
Pyrrophyta							
<u>Ceratium</u>	270	598	625	1040	808	813	2740
<u>Glenodinium</u>	1453	968	1879	1305	1389	1216	2472
<u>Gymnodinium</u>	763	674	683	919	920	761	2026
<u>Peridinium</u>	398	208	304	549	652	713	5380

Appendix 5-D. (Continued)

Echinosphaerella	0	0	0	0	0	0	0	0	0	0	0	10	0	0
Elakatothrix	0	0	0	0	0	0	0	115	0	0	0	0	0	21
Euastrum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eudorina	0	0	0	0	0	0	0	996	0	0	0	0	0	0
Franceia	0	31	0	73	0	10	21	94	83	31	10	10	62	125
Gloeoactinium	0	0	41	0	0	0	0	105	0	0	0	0	0	0
Gloeocystis	0	0	0	0	0	0	0	0	62	0	0	0	263	0
Golenkinia	1742	1256	2832	3022	1124	1501	1166	1051	569	323	135	372	114	325
Gonium	0	0	0	41	0	0	31	819	6131	1774	363	415	0	581
Hyalotheca	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirchneriella	83	342	583	192	355	76	446	3348	2400	547	426	146	547	2295
Micractinium	465	1028	948	550	747	1960	2200	2831	1473	218	602	581	1380	3797
Micrasterias	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mougeotia	0	329	0	434	0	0	0	0	0	0	0	0	0	0
Oocystis	381	816	709	868	699	484	1048	725	740	296	753	432	640	2281

Appendix 5-D. (Continued)

	Feb.							May						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Pandorina	571	0	0	166	510	0	263	4167	1735	1864	1841	1676	1841	9370
Pediastrum	0	0	0	0	0	789	0	2775	830	332	332	498	0	706
Planktosphaeria	131	460	296	131	329	296	329	1183	66	164	164	164	0	131
Platydorina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleodorina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polyedriopsis	0	0	0	0	0	0	0	21	0	0	0	0	0	0
Protococcus	0	0	0	0	1432	0	0	1461	0	0	1994	0	0	280
Pteromonas	43	0	0	66	0	83	0	232	62	0	0	10	0	10
Pyramimonas	0	0	0	0	0	0	0	159	0	0	0	0	0	0
Quadrigula	131	259	329	0	394	263	197	0	125	0	62	125	0	0
Scenedesmus	3359	3796	2672	1656	2061	4272	3320	24974	8356	8602	12242	14525	16462	20475
Schroederia	721	431	867	498	757	228	782	892	1029	239	441	564	313	799
Selenastrum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spermatozoopsis	0	0	0	0	0	0	0	0	0	9	0	0	0	0
Sphaerocystis	0	0	0	0	0	0	0	0	0	263	0	394	0	723
Spirogyra	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spondylosium	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Staurastrum	21	0	0	31	62	52	104	73	207	73	31	21	10	31
Stigeoclonium	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tetradesmus	0	0	0	0	131	0	0	0	0	0	0	0	0	0
Tetraedron	0	0	0	0	0	0	0	60	0	21	97	71	62	0
Tetraspora	0	526	131	0	263	263	0	131	131	0	131	131	263	526
Tetrastrum	0	41	297	470	332	290	581	168	36	166	41	41	125	160
Treubaria	142	0	0	31	41	93	85	282	240	105	137	242	73	218
Trochiscia	0	156	220	124	0	0	0	540	0	0	0	0	0	0
Ulothrix	0	6015	3977	2137	1939	2465	920	657	0	0	0	0	54	0

Appendix 5-D. (Continued)

Chrysophyta														
Achnanthes	1185	559	135	353	220	124	83	735	943	280	348	224	276	290
Asterionella	23261	27748	30609	29539	37286	42788	31339	7678	5439	7862	13916	17298	12305	26197
Attheya	0	0	0	10	0	0	0	1079	612	10	0	10	0	0
Caloneis	0	0	0	1089	322	0	0	0	0	0	0	0	0	0
Chaetoceros	6496	11096	9618	10190	11236	10588	11723	2882	871	1940	2438	2023	2624	4440
Cocconeis	163	457	41	197	0	62	131	32	21	0	10	339	10	2168
Cyclotella	718	1204	1623	661	1465	1026	432	1486	1696	801	937	795	1000	2473
Cymatopleura	0	0	0	0	0	0	0	0	0	0	10	0	0	0
Cymbella	427	528	562	335	240	190	114	364	182	158	82	71	178	104
Diatoma	322	145	135	116	259	93	83	42	10	0	173	41	93	86
Dichotomococcus	0	0	0	31	0	0	0	0	0	0	0	0	0	0

Appendix 5-D. (Continued)

	Feb.							May						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Dinobryon	6620	10809	8072	8271	9842	8079	11004	19743	23855	3201	1679	2597	1077	2609
Eunotia	0	66	0	0	33	0	0	0	1282	0	33	0	0	0
Fragilaria	1224	8839	1852	4340	2723	2547	1929	2228	11462	14371	27902	20181	28213	76790
Gomphonema	301	62	93	156	137	197	187	116	21	9	0	9	70	0
Gyrosigma	31	0	0	0	0	0	0	0	0	42	0	0	33	0
Mallomonas	16696	592	491	43	192	380	14737	338	33	0	66	66	0	33
Melosira	175024	228613	193509	211482	227246	240167	125659	74757	70453	121567	183662	167591	165630	249950
Meridion	0	0	0	0	0	0	0	259	0	0	0	0	0	0
Navicula	1983	2920	1903	1346	2022	1245	1050	909	509	991	1127	453	620	495
Nitzschia	656	33	74	33	0	152	73	575	307	149	339	244	531	202
Ophiocytium	0	0	0	0	0	0	10	0	0	0	0	0	0	0
Pinnularia	0	33	0	66	0	0	0	0	0	0	0	0	0	0
Pleurosigma	0	0	0	0	33	0	0	0	0	33	10	0	0	99
Rhizosolenia	223	207	104	114	259	176	405	1361	1026	240	166	83	126	529
Rhoicosphenia	33	592	164	0	43	66	33	0	0	31	0	0	0	33
Stephanodiscus	15885	21429	11356	10406	14437	14821	17506	1706	1176	1637	2029	1994	2230	4603
Surirella	1062	99	230	164	362	197	131	0	33	0	33	33	0	0
Synedra	4716	6218	7424	5753	7436	6727	5888	10885	4386	4158	4253	5048	4575	8927
Synura	2510	4660	3589	3872	3579	4149	5145	21	0	0	0	10	0	0
Tabellaria	799	1369	1121	1573	1234	550	705	0	0	187	52	580	33	758

Appendix 5-D. (Continued)

Cryptophyta														
Chroomonas	1037	1546	1535	2002	1981	1421	3309	22313	11517	6526	4753	3694	4632	7372
Cryptomonas	1328	1380	1183	2313	2645	2002	2822	8793	8201	4523	3975	2575	4599	7694
Cryptophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanophyta														
Anabaena	0	329	164	0	0	0	0	71	0	0	0	0	0	353
Anabaenopsis	0	0	0	0	0	0	0	0	0	218	0	0	0	0
Anacystis	2118	7115	9790	3649	6499	4865	8906	32559	10034	11612	15845	23351	21247	39604
Aphanizomenon	0	0	0	0	0	0	0	0	799	0	0	0	0	0
Aphanocapsa	0	0	0	0	0	0	0	5461	0	857	0	0	0	268
Aphanothece	0	0	0	0	0	0	0	794	589	1153	788	363	1037	3838
Calothrix	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chroococcus	0	0	0	0	0	0	0	610	128	119	0	0	0	41
Coelosphaerium	0	0	0	0	0	0	0	1048	0	0	0	0	0	0
Cyanophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cylindrospermum	0	0	0	164	394	164	362	64	0	0	0	99	0	0

Appendix 5-D. (Continued)

	Feb.							May						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Dactylococcopsis	5403	11767	9729	9222	9085	7392	11089	6962	2099	4239	4919	6410	6367	6972
Eucapsis	0	0	0	0	0	156	0	0	0	0	0	0	0	0
Gloeothece	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gomphosphaeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lyngbya	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Merismopedia	3115	249	290	332	484	339	256	5323	3350	3615	3193	3758	3410	7935
Microcystis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oscillatoria	68536	30365	21340	18867	17666	7314	18008	63240	41585	34883	41338	36726	38619	142270
Oscillatoria (spiral)	0	0	0	31	0	187	31	0	2490	0	0	0	0	0
Phormidium	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Raphidiopsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euglenophyta														
Cryptoglena	52	52	73	93	156	10	41	0	31	10	0	0	0	0
Euglena	3337	1306	2193	4010	3023	3506	3284	1251	738	624	456	425	469	4313
Euglenophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phacus	0	0	0	0	0	66	66	0	0	0	0	0	0	31
Trachelomonas	2882	979	1671	1794	2012	1621	1569	1650	1243	564	1098	891	921	1821

Appendix 5-D. (Continued)

Pyrrophyta														
Ceratium	0	0	0	0	0	0	0	52	52	21	124	31	52	83
Glenodinium	330	297	192	265	299	62	605	197	135	145	145	145	218	496
Gymnodinium	0	152	150	99	128	97	93	566	356	145	52	156	176	325
Peridinium	0	0	0	0	0	0	0	138	96	39	9	10	10	37
Pyrrophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-D. (Continued)

Echinosphaerella	41	0	0	0	0	0	0	0	0	0	0	0	0	0
Elakatothrix	386	258	594	1172	708	499	1332	0	0	0	263	0	0	131
Euastrum	28	184	405	503	273	222	445	263	9	18	61	21	19	66
Eudorina	1052	2436	3932	5348	7057	1723	6255	0	0	0	0	0	0	0
Franceia	384	541	1407	1087	1039	571	1306	9	0	10	51	32	27	41
Gloeoactinium	2896	4633	10364	7433	12578	8653	21607	0	0	222	0	1023	0	0
Gloeocystis	97	0	263	0	0	263	0	0	0	0	0	0	0	0
Golenkinia	3053	2778	7198	4812	6694	4729	9309	296	226	507	910	959	347	833
Gonium	2073	2103	3627	4621	3283	2342	4677	0	83	54	145	202	581	0
Hyalotheca	187	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirchneriella	7473	11103	21268	18090	11619	11731	21514	535	1097	1505	2178	2100	691	5601
Micractinium	4734	2584	7393	7645	8578	7936	9837	349	514	304	449	228	453	827
Micrasterias	32	0	64	32	64	0	32	0	0	0	0	0	0	0
Mougeotia	419	318	490	1230	3104	2482	3538	0	0	0	95	0	32	159
Oocystis	2821	3414	5092	4823	5069	4074	11777	105	97	251	653	322	163	417

Appendix 5-D. (Continued)

	Aug.							Nov.						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Chlorophyta														
Acanthosphaera	198	218	590	510	427	290	726	0	0	0	0	0	0	0
Actinastrum	2323	1855	4231	5455	5333	4966	6560	74	105	614	1396	1576	848	1069
Ankistrodesmus	2989	3019	3891	2675	2404	3319	7391	1650	2118	3827	6483	5982	8299	7343
Arthrodesmus	0	0	0	0	0	0	21	0	33	0	0	0	0	99
Botryococcus	8287	1813	1567	4904	5023	1816	4722	0	0	0	0	0	0	0
Bracteacoccus	0	166	0	0	0	0	0	0	32	0	0	0	0	0
Carteria	263	191	1683	413	476	335	254	0	99	9	66	0	0	66
Characium	18	0	0	18	0	0	0	9	0	0	0	0	0	0
Chlamydomonas	5194	4736	15649	10689	10405	8326	12598	3328	1498	1414	2381	2470	2616	5396
Chlorella	7592	7599	25122	10023	9122	12505	9867	2189	2049	2950	5301	5278	4131	6171
Chlorococcum	540	0	280	312	263	0	561	0	0	0	0	0	0	0
Chlorogonium	95	219	1849	599	444	442	377	0	0	0	0	0	0	0
Chodatella	1601	1709	1495	2045	1782	1681	1991	372	373	500	431	471	324	494
Cladophora	997	31	0	0	0	0	0	0	0	0	0	0	0	0
Closteridium	0	0	0	0	0	0	0	0	32	0	0	0	0	32
Closteriopsis	223	31	148	42	42	126	85	32	0	32	0	32	0	0
Closterium	9	31	0	31	143	28	449	0	0	0	0	0	0	9
Coelastrum	11488	16632	35121	24922	28070	24329	49088	655	141	691	1741	1137	1041	226
Cosmarium	84	104	156	268	104	83	304	32	0	0	0	0	10	0
Crucigenia	6827	10878	11382	14760	12278	14096	18560	607	300	358	2120	1677	1048	1779
Dactylococcus	0	166	187	0	0	0	0	0	0	197	0	263	657	131
Dictyosphaerium	5428	6398	6428	5137	6878	7845	22565	453	623	1250	1000	2368	1789	2738

Appendix 5-D. (Continued)

	Aug.							Nov.						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Pandorina	5251	5707	10389	12040	12067	11441	25481	406	547	1332	1309	1072	1218	3532
Pediastrum	11462	11728	14716	18080	17371	13430	25348	657	252	1087	2272	857	3799	1874
Planktosphaeria	653	1611	2770	4131	4436	3342	3129	460	131	197	230	427	427	394
Platydorina	0	0	0	1986	1052	0	2630	0	0	0	0	0	0	0
Pleodorina	0	0	1052	0	3156	1052	4207	0	0	0	0	0	0	0
Polyedriopsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protococcus	1046	3991	2585	1153	2492	1495	4382	0	0	0	0	0	0	0
Pteromonas	354	273	643	949	730	773	707	0	33	10	41	31	0	64
Pyramimonas	0	0	1715	0	93	0	0	0	0	0	0	0	0	0
Quadrigula	32	0	191	0	160	0	381	80	116	0	127	143	36	268
Scenedesmus	46714	59566	100517	84890	77093	77051	110454	6657	5388	19231	19305	19818	20063	22005
Schroederia	960	2616	2515	2157	2385	2047	5920	0	10	43	31	0	85	10
Selenastrum	32	125	0	0	0	0	0	0	0	0	603	0	0	0
Spermatozoopsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphaerocystis	32	572	699	826	0	295	789	0	0	0	0	0	0	32
Spirogyra	0	0	0	0	0	0	0	0	0	0	0	0	114	0
Spondylosium	41	222	1147	724	294	184	222	9	0	0	0	0	0	0
Staurastrum	620	837	1241	2002	2407	2428	3444	0	0	0	0	19	32	0
Stigeoclonium	0	0	0	95	127	32	0	0	286	0	0	0	0	0
Tetradesmus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tetraedron	2860	4671	13428	7832	8031	6021	15357	103	172	279	236	272	229	272
Tetraspora	526	0	460	131	789	394	0	0	0	131	0	263	131	526
Tetrastrum	266	361	235	1513	789	320	897	36	173	348	782	652	119	527
Treubaria	1135	757	2388	2488	1981	1713	3548	32	0	43	75	139	13	139
Trochiscia	541	413	127	635	253	413	286	540	349	540	890	286	413	667
Ulothrix	0	0	0	0	0	0	0	0	0	0	0	413	0	0

Appendix 5-D. (Continued)

Chrysophyta														
Achnanthes	2836	2797	7745	8380	7460	5907	12945	275	663	106	114	128	45	355
Asterionella	166	0	1148	1072	1212	1062	2935	149	313	104	1124	1844	1028	581
Attheya	21	147	228	415	249	477	353	21	21	31	21	41	31	41
Caloneis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chaetoceros	2182	1617	3500	2112	2273	1749	2784	0	592	576	1247	769	1062	1180
Cocconeis	294	74	51	136	0	252	31	218	37	68	128	0	106	42
Cyclotella	4197	3414	7451	7829	8070	6011	14619	4121	5324	7184	9891	9955	12158	14551
Cymatopleura	0	0	0	0	0	21	0	0	0	0	0	0	0	0
Cymbella	310	156	248	532	373	475	522	61	19	74	93	43	104	123
Diatoma	42	21	145	135	135	124	124	0	0	53	32	10	33	10
Dichotomococcus	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-D. (Continued)

	Aug.							Nov.						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Dinobryon	1534	508	1140	2127	1421	1442	1821	199	66	72	172	99	18	51
Eunotia	197	131	1348	1348	2367	1748	460	9	0	0	0	0	0	0
Fragilaria	2678	6328	9396	13029	12498	15749	45293	0	0	379	0	1277	33	239
Gomphonema	0	52	30	63	10	0	42	9	9	0	0	0	42	64
Gyrosigma	9	31	0	10	10	31	21	0	0	0	0	0	0	0
Mallomonas	45	0	18	36	54	54	0	0	27	9	80	214	98	187
Melosira	33790	29489	44314	55997	62177	57306	81634	17577	27611	51481	75825	79794	61676	85546
Meridion	0	0	21	0	0	0	0	0	0	0	0	0	0	0
Navicula	1105	669	940	630	718	969	739	423	173	136	164	372	721	503
Nitzschia	939	418	1050	700	870	965	765	140	125	104	214	116	347	183
Ophiocytium	9	0	0	0	18	0	54	0	0	0	0	0	0	0
Pinnularia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleurosigma	0	0	0	0	0	0	10	0	0	0	0	0	0	0
Rhizosolenia	897	1459	3950	5983	5083	4162	6828	10	9	41	0	73	21	10
Rhoicosphenia	21	104	21	0	0	0	21	0	0	0	0	0	0	0
Stephanodiscus	3072	1876	5752	4019	4565	3830	2636	1210	976	1731	2530	2366	1823	3615
Surirella	32	32	0	18	0	0	0	10	0	0	33	32	0	33
Synedra	17504	22462	51598	61652	61854	59375	87739	1598	895	1272	3372	2324	3003	3005
Synura	0	0	280	0	285	0	0	0	0	0	0	10	0	0
Tabellaria	18	0	0	0	131	36	0	589	0	0	0	0	9	0

Appendix 5-D. (Continued)

Cryptophyta														
Chroomonas	648	872	1427	1176	1224	1220	2191	1624	1411	2010	3427	3498	3775	4694
Cryptomonas	1210	1410	2028	2295	2486	1783	2841	1120	887	1892	3258	3670	2902	4018
Cryptophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanophyta														
Anabaena	1930	3044	4553	5218	13528	5954	20925	0	427	0	0	0	0	0
Anabaenopsis	0	2728	0	10052	0	156	0	0	0	0	0	0	0	0
Anacystis	134028	166311	190804	183772	268060	217870	281288	8049	8846	12946	41205	37972	20918	33349
Aphanizomenon	0	0	64	32	0	0	2521	0	0	0	0	0	0	0
Aphanocapsa	1766	0	2858	1071	3390	2697	5141	0	178	0	0	0	0	0
Aphanothece	0	0	0	826	1397	847	5355	191	0	0	1349	0	0	0
Calothrix	97	0	0	0	0	0	0	0	0	0	0	0	0	0
Chroococcus	3838	4091	9407	6580	5978	3171	30796	0	71	0	0	0	0	0
Coelosphaerium	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cylindrospermum	0	0	0	0	0	0	99	0	0	0	0	0	0	0

Appendix 5-D. (Continued)

	Aug.							Nov.						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Dactylococcopsis	2212	5211	7623	10890	14421	15465	16036	1846	1227	2677	4870	5876	3892	5806
Eucapsis	3235	0	16800	0	1052	0	1249	0	0	0	0	0	0	0
Gloeothece	1391	0	405	997	7320	1931	42644	0	0	0	889	349	286	0
Gomphosphaeria	0	0	0	0	0	0	526	0	0	526	0	0	0	526
Lyngbya	5539	16578	30719	34805	36904	51776	79785	32	0	0	0	0	0	0
Merismopedia	88354	60351	113953	111351	105398	96242	157567	1011	263	3363	5202	13364	1377	2940
Microcystis	0	0	0	986	8448	8316	8743	0	0	0	0	0	0	0
Oscillatoria	52759	83109	115585	205449	176235	202325	319259	7765	5474	8460	9764	4995	10577	6161
Oscillatoria (spiral)	0	0	0	0	446	0	0	0	0	0	0	0	0	0
Phormidium	197	2860	4635	5827	9269	7889	8218	0	0	0	0	0	0	427
Raphidiopsis	28877	56140	200146	380403	370679	251013	1081E3	830	507	1331	1084	1175	731	725
Euglenophyta														
Cryptoglena	74	21	95	136	126	32	42	127	254	159	159	286	95	540
Euglena	2389	1282	3632	2605	2171	4143	3997	491	256	484	674	903	990	1647
Euglenophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phacus	21	10	30	242	377	276	66	21	41	135	312	105	95	104
Trachelomonas	1080	1088	3582	3425	3994	2735	5881	415	497	628	1769	1333	1632	4766
Pyrrophyta														
Ceratium	188	536	540	867	667	642	2529	30	10	64	49	109	119	128
Glenodinium	852	536	1542	825	861	794	794	74	0	0	70	84	142	576
Gymnodinium	166	166	345	748	616	436	1426	31	0	42	21	21	53	181
Peridinium	260	112	266	498	642	661	5316	0	0	0	42	0	42	27
Pyrrophyta	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 5-E

COEFFICIENTS OF REGRESSIONS WHICH DESCRIBE CHANGES IN SEASONAL AND TOTAL PHYTOPLANKTON ABUNDANCE IN THE TENNESSEE RIVER BETWEEN TRM 478.2 AND TRM 532.1, INCLUSIVE

Appendix 5-E. Coefficients of Regressions* which Describe Changes in Seasonal and Total Phytoplankton Abundance in the Tennessee River Between TRM 478.2 and TRM 532.1 Inclusive‡

Year	Type of Abundance	a	b	c
1973	Total	5.8279	-0.061004	0.008370
	Winter	5.8087	0.051184	-0.006526
	Spring†	5.7909	-0.060494	0.008755
	Summer†	6.2056	-0.097240	0.013880
	Fall†	5.5064	-0.137467	0.017371
1974	Total	5.6968	-0.117654	0.012968
	Winter	5.3007	-0.118556	0.012418
	Spring	6.115546	-0.122672	0.0128142
	Summer†	6.4352	-0.314659	0.026639
	Fall†	4.9356	0.085270	0.000002
1975	Total	6.1929	-0.198379	0.017996
	Winter	5.4356	0.007654	-0.002140
	Spring	6.2260	-0.18636	0.021494
	Summer†	7.0248	-0.332213	0.026009
	Fall	6.0806	-0.282595	0.026619
1976	Total	6.2297	-0.113519	0.011132
	Winter	6.4158	-0.037090	0.002764
	Spring	5.9652	-0.20557	0.017120
	Summer	7.0558	-0.196825	0.018077
	Fall†	5.4434	0.031178	0.001826
1977	Total	5.6822	0.172612	-0.011473
	Winter†	5.8267	0.266355	-0.021348
	Spring	5.9124	-0.019799	0.001093
	Summer	6.7507	0.051289	-0.007598
	Fall†	4.5157	0.290851	-0.010079
1982	Total†	5.6813	0.012919	0.004980
	Winter	-	-	-
	Spring†	6.0385	-0.022853	-0.004317
	Summer†	6.8056	-0.260192	0.031329
	Fall†	4.6610	0.222727	-0.006997

Appendix 5-E. (Continued)

Year	Type of Abundance	a	b	c
1983	Total†	5.5915	-0.041855	0.009652
	Winter	5.5062	0.044242	-0.003534
	Spring†	4.7701	0.250158	-0.006442
	Summer†	6.9158	-0.316438	0.031188
	Fall†	5.1740	-0.14538	0.017399
1984	Total†	5.1058	0.148350	-0.006908
	Winter†	5.9765	0.040371	-0.000996
	Spring†	5.4198	-0.082935	0.011240
	Summer†	4.9679	0.424216	-0.025888
1985	Total	6.3649	-0.138043	0.011770
	Winter	5.5131	-0.000797	0.000570
	Spring†	7.1094	-0.241162	0.016222
	Summer†	6.3110	-0.010899	0.008436
	Fall	4.4655	0.290462	-0.017776

*Regressions By Year were of the General Quadratic Form: $Y = a + b\,x + c\,x^2$ where "X" was the coded river location (No. 1 = TRM 478.2 . . . No. 10 = TRM 532.1) and Y was the Logarithm of Abundance.

†Prob > F $\geq$ 0.05.

‡Station Codes = "X."

Station 01 = TRM 478.2
Station 02 = TRM 483.4
Station 03 = TRM 490.5
Station 04 = TRM 496.5
Station 05 = TRM 506.6
Station 06 = TRM 518.0
Station 07 = TRM 527.4
Station 08 = TRM 528.0
Station 09 = TRM 529.5
Station 10 = TRM 532.1

APPENDIX 5-F

CHLOROPHYLL A CONCENTRATIONS (MG/M^3)
AT EACH SAMPLE LOCATION (COMBINED DEPTHS)
DURING PREOPERATIONAL MONITORING (1973-1977 AND 1982-1985),
WATTS BAR NUCLEAR PLANT

Appendix 5-F. Chlorophyll a Concentrations (Mg/m3) at each Sample Location (Combined Depths) During Preoperational Monitoring (1973-1977 and 1982-1985) Watts Bar Nuclear Plant

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
FEB73	1		3.00	3.10	4.07	3.81	3.31	3.05
	2		2.39	3.41	3.77	3.05	3.31	3.05
	3		2.60	3.41	3.41	3.45	3.41	3.36
	4		3.62	3.44	4.69	3.36	3.36	3.36
	x		2.90	3.34	3.98	3.42	3.35	3.21
	s		0.54	0.16	0.54	0.31	0.05	0.18
	cv		18.67	4.89	13.58	9.09	1.47	5.54
MAY73	1	1.53	0.61	1.28	1.63	3.00	2.14	5.54
	2	1.28	0.20	1.59	1.98	2.20	1.88	4.92
	3	0.56	0.56	1.22	1.98	2.29	2.24	6.24
	4	0.31	0.56	1.01	1.98	1.88	1.94	4.73
	x	0.92	0.48	1.27	1.90	2.34	2.05	5.36
	s	0.58	0.19	0.24	0.17	0.47	0.17	0.68
	cv	62.94	38.87	18.72	9.20	20.13	8.22	12.77
AUG73	1	0.61	3.81	3.85	4.52	3.85	6.29	
	2	0.61	3.81	4.20	4.16	3.41	6.56	
	3	0.61	3.77	3.81	3.81	3.77	6.24	
	4	0.61	4.20	4.43	5.22	3.77	6.56	
	x	0.61	3.90	4.07	4.43	3.70	6.41	
	s	0.00	0.21	0.30	0.60	0.20	0.17	
	cv	0.00	5.29	7.28	13.64	5.30	2.64	
NOV73	1	2.24	1.94	2.29	0.15	3.75	2.64	4.78
	2	1.37	2.20	2.54	0.51	4.78	3.75	0.88
	3	0.71	1.84	2.29	3.62	3.36	2.42	4.43
	4	2.29	2.24	2.29	3.67	3.31	4.06	5.55
	x	1.65	2.05	2.35	1.99	3.80	3.22	3.91
	s	0.76	0.20	0.13	1.92	0.68	0.81	2.07
	cv	45.78	9.53	5.48	96.49	17.93	25.08	53.06

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
FEB74	1	1.32	2.24	2.78	2.07	2.69	2.29	2.69
	2	0.00	1.94	2.43	2.95	2.33	2.38	1.67
	3	0.36	2.29	2.03	3.85	2.69	1.67	3.00
	4	0.36	1.71	2.08	3.21	2.69	2.02	2.47
	x	0.51	2.04	2.33	3.02	2.60	2.09	2.46
	s	0.57	0.27	0.35	0.74	0.18	0.32	0.57
	cv	111.7	13.19	15.01	24.45	6.83	15.16	23.15
MAY74	1		0.13	3.30	2.69	3.72	4.32	6.42
	2		1.58	1.37	2.38	3.67	2.70	7.12
	3		1.32	2.03	2.78	3.67	4.02	6.46
	4		1.02	2.34	3.40	4.99	3.97	6.01
	x		1.01	2.26	2.82	4.01	3.75	6.50
	s		0.63	0.81	0.43	0.65	0.72	0.46
	cv		62.21	35.69	15.17	16.27	19.20	7.10
AUG74	1	1.42	1.02	1.77	3.15	3.81	2.74	3.86
	2	2.76	0.71	2.13	2.83	3.46	3.19	10.76
	3	0.36	0.71	2.09	3.50	3.50	2.79	7.67
	4	0.36	0.36	1.73	2.83	3.85	2.79	4.26
	x	1.22	0.70	1.93	3.08	3.66	2.88	6.64
	s	1.14	0.27	0.21	0.32	0.20	0.21	3.24
	cv	93.27	38.63	10.73	10.40	5.51	7.24	48.80
NOV74	1	1.97	0.09	0.00	5.01	7.53	7.46	7.33
	2	1.72	3.06	6.07	6.54	7.66	7.95	8.05
	3	1.77	3.96	6.11	7.64	7.80	6.38	7.48
	4	0.87	3.29	6.18	8.24	6.57	6.22	7.82
	x	1.58	2.60	4.59	6.86	7.39	7.00	7.67
	s	0.49	1.72	3.06	1.41	0.55	0.84	0.33
	cv	30.93	66.12	66.67	20.63	7.51	11.98	4.25

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
MAY75	1		0.61	0.66	1.02	1.37	0.35	1.32
	2	1.37	0.66	0.71	1.32	1.02	0.35	1.37
	3	0.66	0.35	0.97	1.37	1.06	0.75	1.68
	4	0.97	0.66	1.02	1.06	1.02	0.66	1.73
	x	1.00	0.57	0.84	1.19	1.12	0.53	1.53
	s	0.36	0.15	0.18	0.18	0.17	0.21	0.21
	cv	35.59	26.06	21.58	14.93	15.16	39.47	13.76
AUG75	1		2.04	1.78	2.09	2.45	1.38	6.26
	2		1.73	1.43	2.14	1.83	2.75	5.55
	3		1.78	2.09	2.45	2.14	2.09	5.24
	4		2.09	2.09	2.14	2.09	1.47	4.53
	x		1.91	1.85	2.21	2.13	1.92	5.40
	s		0.18	0.31	0.17	0.25	0.64	0.72
	cv		9.49	17.02	7.48	11.96	33.06	13.30
NOV75	1	1.73	1.48	0.56	1.88	2.24	2.55	1.17
	2	1.73	0.51	1.17	2.24	2.54	2.55	7.63
	3	1.69	0.51	0.86	1.88	2.19	2.90	3.87
	4	1.78	0.81	1.17	2.54	2.19	2.19	4.23
	x	1.73	0.83	0.94	2.14	2.29	2.55	4.23
	s	0.04	0.46	0.29	0.32	0.17	0.29	2.65
	cv	2.13	55.28	31.11	14.94	7.35	11.38	62.70
FEB76	1	3.46	5.71	7.80	6.94	6.58	7.71	6.48
	2	3.46	5.09	4.17	7.29	7.40	6.83	7.45
	3	3.11	5.35	5.35	6.58	6.27	6.79	7.10
	4	3.47	5.76	7.76	6.01	7.15	7.40	7.09
	x	3.38	5.48	6.27	6.71	6.85	7.18	7.03
	s	0.18	0.32	1.81	0.55	0.52	0.45	0.40
	cv	5.24	5.78	28.85	8.15	7.55	6.25	5.73

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
MAY76	1		0.00	0.75	3.81	3.86	3.15	6.25
	2		0.00	1.06	4.17	4.87	2.84	5.18
	3		0.09	1.06	4.17	4.87	3.15	7.98
	4		0.04	1.11	3.50	3.81	3.50	15.91
	x		0.03	1.00	3.91	4.35	3.16	8.83
	s		0.04	0.17	0.32	0.60	0.27	4.86
	cv		131.4	16.59	8.26	13.74	8.53	55.03
AUG76	1		0.00	2.79	5.44	4.12	3.76	12.31
	2		0.36	3.05	6.09	3.50	4.37	10.89
	3		1.63	1.78	6.15	5.08	4.38	10.87
	4		2.69	3.40	5.08	5.80	2.79	9.92
	x		1.17	2.76	5.69	4.63	3.83	11.00
	s		1.23	0.70	0.52	1.02	0.75	0.99
	cv		105.2	25.28	9.11	22.01	19.57	8.96
NOV76	1		2.60	4.99	5.30	5.91	6.01	5.96
	2		3.26	5.34	6.72	5.70	6.67	5.70
	3		3.31	2.24	5.30	5.39	6.06	7.03
	4		3.21	5.65	4.99	4.68	5.74	6.67
	x		3.09	4.56	5.58	5.42	6.12	6.34
	s		0.33	1.57	0.78	0.54	0.39	0.62
	cv		10.74	34.40	13.91	9.92	6.42	9.72
FEB77	1		12.91	13.97	13.97	14.64	11.79	17.34
	2		13.26	13.26	13.62	13.52	10.11	16.27
	3		13.26	14.59	12.60	14.28	11.13	17.34
	4		13.21	13.26	12.46	14.94	13.17	17.03
	x		13.16	13.77	13.16	14.35	11.55	17.00
	s		0.17	0.64	0.75	0.61	1.28	0.50
	cv		1.28	4.65	5.67	4.27	11.10	2.97

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
MAY77	1		0.00	0.24	0.55	1.16	1.82	9.81
	2		0.00	0.00	0.55	1.56	1.61	9.40
	3		0.00	0.55	1.52	1.21	1.52	6.70
	4		0.00	0.00	1.21	1.87	0.90	4.62
	x		0.00	0.20	0.96	1.45	1.46	7.63
	s		0.00	0.26	0.49	0.33	0.40	2.44
	cv		.	132.1	50.89	22.88	27.04	31.92
AUG77	1	1.16	0.00	1.47	2.73	1.51	2.27	7.11
	2	2.53	0.00	0.80	3.19	2.89	1.92	11.63
	3	0.45	0.14	0.45	2.49	2.53	3.19	10.11
	4	0.75	0.05	1.11	3.60	2.98	2.27	11.54
	x	1.22	0.05	0.96	3.00	2.48	2.41	10.10
	s	0.92	0.07	0.44	0.49	0.67	0.54	2.11
	cv	75.17	139	45.45	16.42	27.19	22.55	20.89
NOV77	1	0.00	0.00	1.21	3.03	2.68	5.07	14.19
	2	0.00	0.00	0.95	0.50	2.58		11.53
	3	0.00	0.00	1.21	2.94	2.99		8.13
	4	0.00	0.00	2.23	1.21	2.32		6.35
	x	0.00	0.00	1.40	1.92	2.64	5.07	10.05
	s	0.00	0.00	0.57	1.26	0.28	.	3.50
	cv	.	.	40.48	65.83	10.48	.	34.81

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
FEB74	1	1.32	2.24	2.78	2.07	2.69	2.29	2.69
	2	0.00	1.94	2.43	2.95	2.33	2.38	1.67
	3	0.36	2.29	2.03	3.85	2.69	1.67	3.00
	4	0.36	1.71	2.08	3.21	2.69	2.02	2.47
	x	0.51	2.04	2.33	3.02	2.60	2.09	2.46
	s	0.57	0.27	0.35	0.74	0.18	0.32	0.57
	cv	111.7	13.19	15.01	24.45	6.83	15.16	23.15
MAY74	1		0.13	3.30	2.69	3.72	4.32	6.42
	2		1.58	1.37	2.38	3.67	2.70	7.12
	3		1.32	2.03	2.78	3.67	4.02	6.46
	4		1.02	2.34	3.40	4.99	3.97	6.01
	x		1.01	2.26	2.82	4.01	3.75	6.50
	s		0.63	0.81	0.43	0.65	0.72	0.46
	cv		62.21	35.69	15.17	16.27	19.20	7.10
AUG74	1	1.42	1.02	1.77	3.15	3.81	2.74	3.86
	2	2.76	0.71	2.13	2.83	3.46	3.19	10.76
	3	0.36	0.71	2.09	3.50	3.50	2.79	7.67
	4	0.36	0.36	1.73	2.83	3.85	2.79	4.26
	x	1.22	0.70	1.93	3.08	3.66	2.88	6.64
	s	1.14	0.27	0.21	0.32	0.20	0.21	3.24
	cv	93.27	38.63	10.73	10.40	5.51	7.24	48.80
NOV74	1	1.97	0.09	0.00	5.01	7.53	7.46	7.33
	2	1.72	3.06	6.07	6.54	7.66	7.95	8.05
	3	1.77	3.96	6.11	7.64	7.80	6.38	7.48
	4	0.87	3.29	6.18	8.24	6.57	6.22	7.82
	x	1.58	2.60	4.59	6.86	7.39	7.00	7.67
	s	0.49	1.72	3.06	1.41	0.55	0.84	0.33
	cv	30.93	66.12	66.67	20.63	7.51	11.98	4.25

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
MAY75	1		0.61	0.66	1.02	1.37	0.35	1.32
	2	1.37	0.66	0.71	1.32	1.02	0.35	1.37
	3	0.66	0.35	0.97	1.37	1.06	0.75	1.68
	4	0.97	0.66	1.02	1.06	1.02	0.66	1.73
	x	1.00	0.57	0.84	1.19	1.12	0.53	1.53
	s	0.36	0.15	0.18	0.18	0.17	0.21	0.21
	cv	35.59	26.06	21.58	14.93	15.16	39.47	13.76
AUG75	1		2.04	1.78	2.09	2.45	1.38	6.26
	2		1.73	1.43	2.14	1.83	2.75	5.55
	3		1.78	2.09	2.45	2.14	2.09	5.24
	4		2.09	2.09	2.14	2.09	1.47	4.53
	x		1.91	1.85	2.21	2.13	1.92	5.40
	s		0.18	0.31	0.17	0.25	0.64	0.72
	cv		9.49	17.02	7.48	11.96	33.06	13.30
NOV75	1	1.73	1.48	0.56	1.88	2.24	2.55	1.17
	2	1.73	0.51	1.17	2.24	2.54	2.55	7.63
	3	1.69	0.51	0.86	1.88	2.19	2.90	3.87
	4	1.78	0.81	1.17	2.54	2.19	2.19	4.23
	x	1.73	0.83	0.94	2.14	2.29	2.55	4.23
	s	0.04	0.46	0.29	0.32	0.17	0.29	2.65
	cv	2.13	55.28	31.11	14.94	7.35	11.38	62.70

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
FEB76	1	3.46	5.71	7.80	6.94	6.58	7.71	6.48
	2	3.46	5.09	4.17	7.29	7.40	6.83	7.45
	3	3.11	5.35	5.35	6.58	6.27	6.79	7.10
	4	3.47	5.76	7.76	6.01	7.15	7.40	7.09
	x	3.38	5.48	6.27	6.71	6.85	7.18	7.03
	s	0.18	0.32	1.81	0.55	0.52	0.45	0.40
	cv	5.24	5.78	28.85	8.15	7.55	6.25	5.73
MAY76	1		0.00	0.75	3.81	3.86	3.15	6.25
	2		0.00	1.06	4.17	4.87	2.84	5.18
	3		0.09	1.06	4.17	4.87	3.15	7.98
	4		0.04	1.11	3.50	3.81	3.50	15.91
	x		0.03	1.00	3.91	4.35	3.16	8.83
	s		0.04	0.17	0.32	0.60	0.27	4.86
	cv		131.4	16.59	8.26	13.74	8.53	55.03
AUG76	1		0.00	2.79	5.44	4.12	3.76	12.31
	2		0.36	3.05	6.09	3.50	4.37	10.89
	3		1.63	1.78	6.15	5.08	4.38	10.87
	4		2.69	3.40	5.08	5.80	2.79	9.92
	x		1.17	2.76	5.69	4.63	3.83	11.00
	s		1.23	0.70	0.52	1.02	0.75	0.99
	cv		105.2	25.28	9.11	22.01	19.57	8.96
NOV76	1		2.60	4.99	5.30	5.91	6.01	5.96
	2		3.26	5.34	6.72	5.70	6.67	5.70
	3		3.31	2.24	5.30	5.39	6.06	7.03
	4		3.21	5.65	4.99	4.68	5.74	6.67
	x		3.09	4.56	5.58	5.42	6.12	6.34
	s		0.33	1.57	0.78	0.54	0.39	0.62
	cv		10.74	34.40	13.91	9.92	6.42	9.72

Appendix 5-F. (Continued)

Date	Sample No.	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5	TRM 532.1
FEB77	1		12.91	13.97	13.97	14.64	11.79	17.34
	2		13.26	13.26	13.62	13.52	10.11	16.27
	3		13.26	14.59	12.60	14.28	11.13	17.34
	4		13.21	13.26	12.46	14.94	13.17	17.03
	x		13.16	13.77	13.16	14.35	11.55	17.00
	s		0.17	0.64	0.75	0.61	1.28	0.50
	cv		1.28	4.65	5.67	4.27	11.10	2.97
MAY77	1		0.00	0.24	0.55	1.16	1.82	9.81
	2		0.00	0.00	0.55	1.56	1.61	9.40
	3		0.00	0.55	1.52	1.21	1.52	6.70
	4		0.00	0.00	1.21	1.87	0.90	4.62
	x		0.00	0.20	0.96	1.45	1.46	7.63
	s		0.00	0.26	0.49	0.33	0.40	2.44
	cv		.	132.1	50.89	22.88	27.04	31.92
AUG77	1	1.16	0.00	1.47	2.73	1.51	2.27	7.11
	2	2.53	0.00	0.80	3.19	2.89	1.92	11.63
	3	0.45	0.14	0.45	2.49	2.53	3.19	10.11
	4	0.75	0.05	1.11	3.60	2.98	2.27	11.54
	x	1.22	0.05	0.96	3.00	2.48	2.41	10.10
	s	0.92	0.07	0.44	0.49	0.67	0.54	2.11
	cv	75.17	139	45.45	16.42	27.19	22.55	20.89
NOV77	1	0.00	0.00	1.21	3.03	2.68	5.07	14.19
	2	0.00	0.00	0.95	0.50	2.58		11.53
	3	0.00	0.00	1.21	2.94	2.99		8.13
	4	0.00	0.00	2.23	1.21	2.32		6.35
	x	0.00	0.00	1.40	1.92	2.64	5.07	10.05
	s	0.00	0.00	0.57	1.26	0.28	.	3.50
	cv	.	.	40.48	65.83	10.48	.	34.81

Appendix 5-F. (Continued)

AUG82	0.3	1	4.34	2.48	1.38	3.98	4.19	1.19	7.51	5.90	1.28
		2	4.97	5.42	1.18	5.08	5.15	1.21	7.22	4.62	1.35
		3	4.15	4.11	1.22	4.51	4.22	1.24	7.90	5.74	1.31
		x	4.49	4.00	1.26	4.52	4.52	1.21	7.54	5.42	1.31
		s	0.43	1.47	0.11	0.55	0.55	0.03	0.34	0.70	0.04
		cv	9.57	36.79	8.40	12.16	12.08	2.07	4.52	12.87	2.67
	1.0	1	3.79	3.36	1.25	4.20	2.30	1.39	7.16	3.98	1.38
		2	4.85	4.33	1.25	4.39	4.49	1.21	7.26	5.07	1.32
		3	4.49	4.22	1.24	4.37	3.58	1.28	8.12	5.66	1.32
		x	4.38	3.97	1.25	4.32	3.46	1.29	7.51	4.90	1.34
		s	0.54	0.53	0.01	0.10	1.10	0.09	0.53	0.85	0.03
		cv	12.32	13.38	0.46	2.42	31.83	7.02	7.02	17.38	2.59
	3.0	1	4.22	4.57	1.18	4.13	4.83	1.15	7.05	4.25	1.36
		2	5.18	4.43	1.26	4.51	4.67	1.20	8.14	5.66	1.32
		3	4.96	4.06	1.28	5.63	7.00	1.13	7.90	6.65	1.26
		x	4.79	4.35	1.24	4.76	5.50	1.16	7.70	5.52	1.31
		s	0.50	0.26	0.05	0.78	1.30	0.04	0.57	1.21	0.05
		cv	10.51	6.05	4.27	16.39	23.66	3.11	7.44	21.85	3.83
	5.0	1	4.79	3.68	1.29	4.23	1.39	1.50	5.93	5.10	1.26
		2	5.42	4.35	1.28	4.17	4.57	1.18	7.12	4.89	1.33
		3	4.95	4.51	1.24	4.85	4.78	1.22	7.90	4.83	1.36
		x	5.05	4.18	1.27	4.42	3.58	1.30	6.98	4.94	1.32
		s	0.33	0.44	0.03	0.38	1.90	0.17	0.99	0.14	0.05
		cv	6.48	10.53	2.08	8.52	53.06	13.41	14.21	2.87	3.90

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 496.5 Chl a Mg/m3	TRM 496.5 Pheo a Mg/m3	TRM 496.5 Pheo Index	TRM 506.6 Chl a Mg/m3	TRM 506.6 Pheo a Mg/m3	TRM 506.6 Pheo Index	TRM 518.0 Chl a Mg/m3	TRM 518.0 Pheo a Mg/m3	TRM 518.0 Pheo Index
NOV82	0.3	1	1.82	0.72	1.45	2.83	1.50	1.39	4.07	1.28	1.50
		2	2.60	0.67	1.53	2.84	1.50	1.39	3.97	1.09	1.52
		3	2.51	0.48	1.57	3.06	1.42	1.42	4.31	8.92	0.90
		x	2.31	0.62	1.52	2.91	1.47	1.40	4.12	3.76	1.31
		s	0.43	0.13	0.06	0.13	0.05	0.02	0.17	4.47	0.35
		cv	18.47	20.31	4.03	4.47	3.13	1.24	4.24	118.7	26.96
	1.0	1	2.04	0.64	1.50	2.84	1.50	1.39	3.82	0.45	1.62
		2	2.39	1.20	1.40	2.58	1.12	1.44	4.07	1.28	1.50
		3	2.58	0.21	1.64	2.82	0.59	1.56	3.60	1.44	1.45
		x	2.34	0.68	1.51	2.75	1.07	1.46	3.83	1.06	1.52
		s	0.27	0.50	0.12	0.14	0.46	0.09	0.24	0.53	0.09
		cv	11.72	72.65	7.97	5.27	42.72	5.97	6.14	50.29	5.74
	3.0	1	2.84	1.04	1.47	2.48	1.39	1.38	4.64	1.76	1.46
		2	2.73	1.76	1.33	2.50	1.84	1.29	3.36	2.43	1.30
		3	2.82	1.50	1.39	2.95	1.68	1.37	4.53	1.12	1.54
		x	2.80	1.43	1.40	2.64	1.64	1.35	4.18	1.77	1.43
		s	0.06	0.36	0.07	0.27	0.23	0.05	0.71	0.66	0.12
		cv	2.10	25.44	5.03	10.05	13.94	3.66	16.98	37.01	8.53
	5.0	1	2.83	0.13	1.67	2.82	1.95	1.32	4.65	0.85	1.58
		2	2.73	1.31	1.41	2.94	2.59	1.24	4.43	1.84	1.44
		3	3.06	0.51	1.59	3.84	0.00	2.27	5.79	2.72	1.42
		x	2.87	0.65	1.56	3.20	1.51	1.61	4.96	1.80	1.48
		s	0.17	0.60	0.13	0.56	1.35	0.57	0.73	0.94	0.09
		cv	5.89	92.67	8.55	17.42	89.15	35.59	14.73	51.88	5.89

Appendix 5-F. (Continued)

			TRM 527.4			TRM 528.0			TRM 529.5		
Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
MAY82	0.3	1	3.10	2.24	1.32	2.43	3.39	1.10	4.25	2.30	1.39
		2	3.91	1.28	1.50	3.23	3.34	1.20	4.45	2.22	1.41
		3	3.79	2.91	1.30	2.53	1.76	1.33	4.37	3.39	1.29
		x	3.60	2.14	1.37	2.73	2.83	1.21	4.36	2.64	1.36
		s	0.44	0.82	0.11	0.44	0.93	0.12	0.10	0.65	0.06
		cv	12.14	38.22	8.02	15.97	32.76	9.53	2.31	24.79	4.72
	1.0	1	4.25	1.84	1.44	3.10	2.70	1.26	4.45	1.76	1.46
		2	3.32	3.98	1.15	3.10	2.24	1.32	7.54	3.18	1.45
		3	4.94	2.51	1.41	3.23	1.98	1.36	4.93	2.06	1.45
		x	4.17	2.78	1.33	3.14	2.31	1.31	5.64	2.33	1.45
		s	0.81	1.09	0.16	0.08	0.36	0.05	1.66	0.75	0.01
		cv	19.50	39.42	11.96	2.39	15.81	3.83	29.48	32.08	0.40
	3.0	1	4.35	2.48	1.38	4.40	3.84	1.25	4.03	4.19	1.19
		2	4.94	0.00	2.04	4.13	2.56	1.36	4.96	1.60	1.50
		3	4.37	2.48	1.38	3.57	1.63	1.43	4.84	2.78	1.37
		x	4.55	1.65	1.60	4.03	2.68	1.35	4.61	2.86	1.35
		s	0.34	1.43	0.38	0.42	1.11	0.09	0.51	1.30	0.16
		cv	7.36	86.60	23.82	10.50	41.45	6.74	10.97	45.39	11.50
	5.0	1	4.84	2.32	1.42	3.57	1.17	1.50	4.71	2.59	1.39
		2	3.57	2.08	1.38	4.81	5.05	1.19	4.69	2.14	1.43
		3	4.60	1.95	1.45	4.93	2.96	1.36	4.69	2.59	1.39
		x	4.34	2.12	1.42	4.44	3.06	1.35	4.70	2.44	1.40
		s	0.67	0.19	0.04	0.75	1.94	0.16	0.01	0.26	0.02
		cv	15.56	8.87	2.48	16.97	63.46	11.50	0.25	10.65	1.65

Appendix 5-F. (Continued)

AUG82	0.3	1	9.22	4.62	1.41	9.38	4.54	1.42	7.83	4.65	1.37
		2	10.49	4.59	1.44	9.84	6.65	1.33	8.22	6.30	1.29
		3	10.94	5.34	1.41	9.59	5.37	1.38	8.45	3.95	1.43
		x	10.22	4.85	1.42	9.60	5.52	1.38	8.17	4.97	1.36
		s	0.89	0.42	0.02	0.23	1.06	0.05	0.31	1.21	0.07
		cv	8.73	8.75	1.22	2.40	19.26	3.28	3.84	24.29	5.15
	1.0	1	9.31	5.71	1.35	9.28	4.81	1.40	6.51	6.49	1.20
		2	9.81	6.19	1.35	10.28	4.67	1.43	7.78	6.01	1.29
		3	10.03	2.03	1.57	8.68	5.69	1.34	4.37	5.85	1.11
		x	9.72	4.64	1.42	9.41	5.06	1.39	6.22	6.12	1.20
		s	0.37	2.28	0.13	0.81	0.55	0.05	1.72	0.33	0.09
		cv	3.80	49.01	8.92	8.59	10.93	3.30	27.71	5.45	7.50
	3.0	1	9.09	5.34	1.37	8.97	3.34	1.47	7.41	4.35	1.37
		2	9.96	5.02	1.41	11.33	6.35	1.38	8.14	5.66	1.32
		3	9.94	6.84	1.32	10.84	4.70	1.44	7.75	5.55	1.31
		x	9.66	5.73	1.37	10.38	4.80	1.43	7.77	5.19	1.33
		s	0.50	0.97	0.05	1.25	1.51	0.05	0.37	0.73	0.03
		cv	5.14	16.95	3.30	12.00	31.42	3.20	4.70	14.01	2.41
	5.0	1	9.87	3.02	1.51	7.49	5.45	1.31	6.83	4.78	1.32
		2	12.10	4.94	1.45	8.79	4.51	1.40	7.78	5.10	1.34
		3	9.25	4.81	1.40	10.26	6.49	1.35	7.44	5.45	1.31
		x	10.41	4.26	1.45	8.85	5.48	1.35	7.35	5.11	1.32
		s	1.50	1.07	0.06	1.39	0.99	0.05	0.48	0.34	0.02
		cv	14.40	25.21	3.79	15.67	18.06	3.33	6.55	6.56	1.15

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 527.4 Chl a Mg/m3	TRM 527.4 Pheo a Mg/m3	TRM 527.4 Pheo Index	TRM 528.0 Chl a Mg/m3	TRM 528.0 Pheo a Mg/m3	TRM 528.0 Pheo Index	TRM 529.5 Chl a Mg/m3	TRM 529.5 Pheo a Mg/m3	TRM 529.5 Pheo Index
NOV82	0.3	1	6.45	1.12	1.58	5.65	0.72	1.61	6.38	1.39	1.56
		2	6.11	0.56	1.64	6.52	1.76	1.53	6.47	1.12	1.58
		3	6.49	0.67	1.63	6.03	0.37	1.66	6.35	0.93	1.60
		x	6.35	0.78	1.62	6.07	0.95	1.60	6.40	1.15	1.58
		s	0.21	0.30	0.03	0.44	0.72	0.07	0.06	0.23	0.02
		cv	3.29	37.88	1.99	7.19	76.10	4.10	0.98	20.16	1.27
	1.0	1	6.03	0.37	1.66	5.11	0.69	1.61	5.21	0.43	1.64
		2	5.92	1.55	1.53	5.11	1.15	1.55	6.14	1.01	1.59
		3	6.13	1.01	1.59	5.45	0.80	1.60	6.03	1.28	1.56
		x	6.03	0.98	1.59	5.22	0.88	1.59	5.79	0.91	1.60
		s	0.11	0.59	0.07	0.20	0.24	0.03	0.51	0.43	0.04
		cv	1.74	60.48	4.08	3.76	27.30	2.03	8.77	47.90	2.53
	3.0	1	6.15	0.56	1.64	5.57	1.44	1.53	3.97	5.18	1.09
		2	5.57	0.53	1.63	3.38	3.34	1.20	3.28	2.70	1.26
		3	5.67	1.63	1.52	5.57	0.99	1.58	6.26	1.20	1.57
		x	5.80	0.91	1.60	4.84	1.92	1.44	4.50	3.03	1.31
		s	0.31	0.63	0.07	1.26	1.25	0.21	1.56	2.01	0.24
		cv	5.35	69.11	4.17	26.12	64.85	14.37	34.64	66.41	18.63
	5.0	1	5.77	1.36	1.55	6.48	1.12	1.58	5.89	1.09	1.58
		2	5.55	0.99	1.58	6.13	0.56	1.64	6.11	0.56	1.64
		3	6.33	1.39	1.56	5.79	1.36	1.55	6.89	1.87	1.53
		x	5.88	1.25	1.56	6.13	1.01	1.59	6.30	1.17	1.58
		s	0.40	0.22	0.02	0.35	0.41	0.05	0.53	0.66	0.06
		cv	6.84	17.87	0.98	5.63	40.51	2.88	8.35	56.16	3.48

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
MAY82	0.3	1	6.77	2.32	1.49
		2	8.81	2.06	1.55
		3	8.46	2.40	1.52
		x	8.01	2.26	1.52
		s	1.09	0.18	0.03
		cv	13.61	7.87	1.97
	1.0	1	8.37	1.76	1.56
		2	7.90	2.38	1.51
		3	7.32	2.35	1.50
		x	7.86	2.16	1.52
		s	0.53	0.35	0.03
		cv	6.69	16.16	2.11
	3.0	1	11.56	2.46	1.56
		2	9.62	1.09	1.62
		3	9.52	0.91	1.63
		x	10.23	1.49	1.60
		s	1.15	0.85	0.04
		cv	11.24	57.02	2.36
	5.0	1	11.10	0.35	1.68
		2	11.19	0.99	1.64
		3	11.66	0.00	1.73
		x	11.32	0.45	1.68
		s	0.30	0.50	0.05
		cv	2.66	112.4	2.68

Appendix 5-F. (Continued)

AUG82	0.3	1	21.17	2.91	1.61
		2	21.17	3.36	1.59
		3	18.61	1.98	1.63
		x	20.32	2.75	1.61
		s	1.48	0.70	0.02
		cv	7.27	25.59	1.24
	1.0	1	19.25	3.82	1.57
		2	20.82	4.17	1.57
		3	20.66	4.43	1.56
		x	20.24	4.14	1.57
		s	0.86	0.31	0.01
		cv	4.27	7.39	0.37
	3.0	1	21.38	3.74	1.58
		2	23.87	3.31	1.61
		3	22.70	3.71	1.59
		x	22.65	3.59	1.59
		s	1.25	0.24	0.02
		cv	5.50	6.69	0.96
	5.0	1	20.24	4.59	1.55
		2	20.55	5.61	1.53
		3	19.05	5.90	1.50
		x	19.95	5.37	1.53
		s	0.79	0.69	0.03
		cv	3.97	12.82	1.65

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
NOV82	0.3	1	7.16	2.70	1.47
		2	6.81	0.77	1.62
		3	6.66	0.59	1.64
		x	6.88	1.35	1.58
		s	0.26	1.17	0.09
		cv	3.73	86.43	5.89
	1.0	1	6.93	1.87	1.53
		2	7.50	0.99	1.61
		3	7.06	0.69	1.63
		x	7.16	1.18	1.59
		s	0.30	0.61	0.05
		cv	4.17	51.83	3.33
	3.0	1	7.04	0.24	1.68
		2	7.16	0.88	1.62
		3	6.72	1.04	1.59
		x	6.97	0.72	1.63
		s	0.23	0.42	0.05
		cv	3.26	58.79	2.81
	5.0	1	5.91	0.64	1.63
		2	6.48	0.67	1.63
		3	6.81	0.00	1.71
		x	6.40	0.44	1.66
		s	0.46	0.38	0.05
		cv	7.11	86.67	2.79

Appendix 5-F. (Continued)

			TRM 496.5			TRM 506.6			TRM 518.0		
Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
FEB83	0.3	1	4.43	1.39	1.50	5.31	1.52	1.52	5.54	0.99	1.58
		2	4.30	0.75	1.58	4.74	0.59	1.62	5.20	0.00	1.70
		3	4.07	2.64	1.33	4.84	0.32	1.65	5.45	1.25	1.55
		x	4.27	1.59	1.47	4.96	0.81	1.60	5.40	0.75	1.61
		s	0.18	0.96	0.13	0.30	0.63	0.07	0.18	0.66	0.08
		cv	4.27	60.33	8.69	6.13	77.72	4.26	3.26	88.34	4.93
	1.0	1	4.31	0.00	1.73	4.77	1.04	1.56	5.33	1.07	1.57
		2	4.75	0.59	1.62	4.75	1.50	1.50	5.33	1.07	1.57
		3	4.63	1.31	1.52	4.50	0.67	1.60	5.43	0.80	1.60
		x	4.56	0.63	1.62	4.67	1.07	1.55	5.36	0.98	1.58
		s	0.23	0.66	0.11	0.15	0.42	0.05	0.06	0.16	0.02
		cv	4.98	103.6	6.47	3.22	38.86	3.24	1.08	15.91	1.10
	3.0	1	4.75	1.04	1.56	5.08	0.24	1.67	5.53	1.44	1.53
		2	4.62	1.76	1.46	4.97	1.87	1.47	5.42	0.80	1.60
		3	4.97	1.42	1.52	4.63	0.00	1.71	5.46	1.25	1.55
		x	4.78	1.41	1.51	4.89	0.70	1.62	5.47	1.16	1.56
		s	0.18	0.36	0.05	0.23	1.02	0.13	0.06	0.33	0.04
		cv	3.70	25.61	3.33	4.79	144.7	7.95	1.02	28.25	2.31
	5.0	1	4.63	0.85	1.58	4.87	1.68	1.48	4.86	0.77	1.59
		2	4.86	0.77	1.59	5.09	2.06	1.45	5.11	2.06	1.45
		3	4.74	1.04	1.56	4.52	0.21	1.67	5.21	0.00	1.70
		x	4.74	0.89	1.58	4.83	1.32	1.53	5.06	0.94	1.58
		s	0.12	0.14	0.02	0.29	0.98	0.12	0.18	1.04	0.13
		cv	2.43	15.64	0.97	5.96	74.21	7.78	3.56	110.3	7.93

Appendix 5-F. (Continued)

JUNB3	0.3	1	3.48	0.80	1.55	3.63	0.99	1.52	10.85	5.23	1.41
		2	3.26	0.43	1.61	3.40	1.07	1.50	7.03	4.33	1.35
		3	2.83	1.04	1.47	3.72	1.63	1.43	7.71	4.54	1.36
		x	3.19	0.76	1.54	3.58	1.23	1.48	8.53	4.70	1.37
		s	0.33	0.31	0.07	0.17	0.35	0.05	2.04	0.47	0.03
		cv	10.36	40.61	4.55	4.61	28.35	3.19	23.89	10.02	2.34
	1.0	1	3.29	0.00	1.71	4.26	3.02	1.31	8.25	4.57	1.38
		2	4.40	1.39	1.50	3.99	2.00	1.40	9.97	5.10	1.40
		3	3.72	0.72	1.57	4.98	3.23	1.33	9.53	5.26	1.38
		x	3.80	0.70	1.59	4.41	2.75	1.35	9.25	4.98	1.39
		s	0.56	0.70	0.11	0.51	0.66	0.05	0.89	0.36	0.01
		cv	14.72	98.84	6.71	11.60	23.93	3.51	9.66	7.26	0.83
	3.0	1	4.07	0.37	1.64	3.96	3.36	1.25	8.39	4.75	1.37
		2	4.06	0.83	1.57	4.43	2.30	1.39	9.61	4.54	1.42
		3	4.19	1.01	1.54	4.76	2.40	1.40	8.80	3.68	1.44
		x	4.11	0.74	1.58	4.38	2.69	1.35	8.93	4.32	1.41
		s	0.07	0.33	0.05	0.40	0.59	0.08	0.62	0.57	0.04
		cv	1.76	44.80	3.24	9.17	21.78	6.23	6.95	13.11	2.56
	5.0	1	4.18	1.47	1.48	4.64	2.67	1.37	8.73	3.50	1.45
		2	4.19	1.01	1.54	5.20	3.60	1.31	8.61	2.86	1.49
		3	3.85	1.36	1.48	3.82	1.82	1.42	8.25	3.66	1.43
		x	4.07	1.28	1.50	4.55	2.70	1.37	8.53	3.34	1.46
		s	0.19	0.24	0.03	0.69	0.89	0.06	0.25	0.42	0.03
		cv	4.75	18.77	2.31	15.24	33.01	4.03	2.93	12.67	2.10

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 496.5 Chl a Mg/m3	TRM 496.5 Pheo a Mg/m3	TRM 496.5 Pheo Index	TRM 506.6 Chl a Mg/m3	TRM 506.6 Pheo a Mg/m3	TRM 506.6 Pheo Index	TRM 518.0 Chl a Mg/m3	TRM 518.0 Pheo a Mg/m3	TRM 518.0 Pheo Index
AUG83	0.3	1	3.35	1.98	1.36	3.02	2.76	1.23	4.91	3.95	1.26
		2	3.45	2.16	1.35	2.79	1.50	1.39	5.13	2.51	1.41
		3	3.70	2.54	1.32	4.03	2.64	1.33	5.14	2.96	1.36
		x	3.50	2.23	1.34	3.28	2.31	1.32	5.06	3.14	1.34
		s	0.18	0.29	0.02	0.66	0.70	0.08	0.13	0.74	0.08
		cv	5.15	12.84	1.55	20.11	30.44	6.14	2.57	23.46	5.69
	1.0	1	3.82	1.82	1.42	3.13	2.51	1.27	5.13	2.06	1.45
		2	3.47	1.71	1.41	3.21	2.24	1.32	5.25	2.70	1.39
		3	3.69	1.63	1.43	3.23	2.70	1.26	5.79	4.54	1.28
		x	3.66	1.72	1.42	3.19	2.48	1.28	5.39	3.10	1.37
		s	0.18	0.10	0.01	0.05	0.23	0.03	0.35	1.29	0.09
		cv	4.83	5.55	0.70	1.66	9.31	2.50	6.52	41.53	6.28
	3.0	1	3.92	3.82	1.21	3.58	2.35	1.33	5.35	3.34	1.34
		2	3.69	2.54	1.32	2.77	2.40	1.25	5.47	6.25	1.14
		3	2.52	2.94	1.15	2.89	2.14	1.30	5.66	2.99	1.39
		x	3.38	3.10	1.23	3.08	2.30	1.29	5.49	4.19	1.29
		s	0.75	0.65	0.09	0.44	0.14	0.04	0.16	1.79	0.13
		cv	22.23	21.12	7.03	14.19	6.01	3.12	2.85	42.68	10.25
	5.0	1	3.81	2.27	1.36	4.14	3.28	1.28	5.89	4.27	1.30
		2	3.70	2.99	1.27	4.26	3.02	1.31	5.69	4.81	1.25
		3	4.13	2.83	1.32	3.91	3.36	1.25	6.03	4.46	1.29
		x	3.88	2.70	1.32	4.10	3.22	1.28	5.87	4.51	1.28
		s	0.22	0.38	0.05	0.18	0.18	0.03	0.17	0.27	0.03
		cv	5.76	14.02	3.42	4.33	5.52	2.34	2.91	6.07	2.07

Appendix 5-F. (Continued)

NOVβ3	0.3	1	1.41	1.52	1.18	2.00	2.00	1.20	4.50	2.94	1.33
		2	1.43	1.07	1.30	1.90	1.82	1.21	4.16	2.83	1.32
		3	1.55	0.35	1.56	1.89	1.36	1.31	4.74	3.76	1.27
		x	1.46	0.98	1.35	1.93	1.73	1.24	4.47	3.18	1.31
		s	0.08	0.59	0.19	0.06	0.33	0.06	0.29	0.51	0.03
		cv	5.17	60.22	14.42	3.15	19.11	4.91	6.52	16.00	2.46
	1.0	1	1.56	1.25	1.27	2.00	1.55	1.29	4.18	2.83	1.32
		2	1.55	0.80	1.40	1.78	1.17	1.33	4.99	4.14	1.26
		3	1.55	1.71	1.17	1.78	2.08	1.14	6.35	5.02	1.27
		x	1.55	1.25	1.28	1.85	1.60	1.25	5.17	4.00	1.28
		s	0.01	0.46	0.12	0.13	0.46	0.10	1.10	1.10	0.03
		cv	0.37	36.30	9.01	6.85	28.57	7.99	21.20	27.57	2.50
	3.0	1	1.55	0.80	1.40	1.90	1.82	1.21	5.09	3.87	1.29
		2	1.66	1.44	1.25	2.00	1.55	1.29	4.53	2.94	1.33
		3	1.43	0.61	1.44	1.99	1.09	1.38	5.67	5.26	1.22
		x	1.55	0.95	1.36	1.96	1.49	1.29	5.10	4.02	1.28
		s	0.12	0.43	0.10	0.06	0.37	0.09	0.57	1.17	0.06
		cv	7.44	45.77	7.35	2.81	24.83	6.58	11.18	29.02	4.35
	5.0	1	1.65	0.53	1.50	2.00	1.09	1.38	5.21	4.51	1.24
		2	1.44	1.52	1.18	2.23	1.47	1.33	4.63	4.49	1.21
		3	1.55	1.25	1.27	2.36	2.56	1.17	4.31	3.92	1.23
		x	1.55	1.10	1.32	2.20	1.71	1.29	4.72	4.31	1.23
		s	0.11	0.51	0.17	0.18	0.76	0.11	0.46	0.34	0.02
		cv	6.79	46.52	12.53	8.30	44.71	8.48	9.67	7.78	1.25

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 527.4 Chl a Mg/m3	TRM 527.4 Pheo a Mg/m3	TRM 527.4 Pheo Index	TRM 528.0 Chl a Mg/m3	TRM 528.0 Pheo a Mg/m3	TRM 528.0 Pheo Index	TRM 529.5 Chl a Mg/m3	TRM 529.5 Pheo a Mg/m3	TRM 529.5 Pheo Index
FEB83	0.3	1	4.06	0.00	2.12	4.77	0.59	1.62	4.29	0.75	1.58
		2	4.40	0.48	1.62	3.95	0.00	2.06	4.30	0.29	1.65
		3	3.97	0.00	1.75	4.40	0.03	1.70	4.09	0.00	1.71
		x	4.14	0.16	1.83	4.37	0.21	1.79	4.23	0.35	1.65
		s	0.23	0.28	0.26	0.41	0.33	0.23	0.12	0.38	0.07
		cv	5.47	173.2	14.18	9.39	160.8	13.07	2.80	109.1	3.95
	1.0	1	4.00	0.19	1.67	4.75	0.00	1.75	4.62	1.76	1.46
		2	3.96	0.64	1.59	3.84	0.00	1.79	4.30	0.29	1.65
		3	3.96	0.64	1.59	4.41	0.93	1.56	4.41	0.03	1.70
		x	3.97	0.49	1.62	4.33	0.31	1.70	4.44	0.69	1.60
		s	0.02	0.26	0.05	0.46	0.54	0.12	0.16	0.93	0.13
		cv	0.58	53.02	2.86	10.61	173.2	7.23	3.66	134.5	7.90
	3.0	1	4.04	0.00	1.71	5.19	0.00	1.70	0.00	0.00	.
		2	4.16	0.11	1.68	4.28	0.29	1.65	4.84	0.00	1.79
		3	4.28	0.00	1.90	3.94	0.19	1.67	4.30	1.20	1.52
		x	4.16	0.04	1.76	4.47	0.16	1.67	3.05	0.40	1.66
		s	0.12	0.06	0.12	0.65	0.15	0.03	2.65	0.69	0.19
		cv	2.88	173.2	6.77	14.46	92.07	1.50	87.05	173.2	11.54
	5.0	1	4.41	0.00	2.05	4.75	0.13	1.68	4.89	0.00	1.72
		2	4.18	0.11	1.68	3.96	0.00	1.75	4.19	1.01	1.54
		3	3.84	0.00	1.70	3.84	1.82	1.42	4.53	0.00	1.74
		x	4.14	0.04	1.81	4.18	0.65	1.62	4.54	0.34	1.67
		s	0.29	0.06	0.21	0.49	1.02	0.17	0.35	0.58	0.11
		cv	6.92	173.2	11.50	11.82	156.2	10.76	7.72	173.2	6.61

Appendix 5-F. (Continued)

JUN83	0.3	1	7.56	2.08	1.52	7.47	1.90	1.53	5.95	4.46	1.29
		2	7.37	3.07	1.44	8.25	3.20	1.46	5.84	3.36	1.37
		3	7.46	4.62	1.35				6.06	3.28	1.38
		x	7.46	3.26	1.44	7.86	2.55	1.50	5.95	3.70	1.35
		s	0.10	1.28	0.09	0.55	0.92	0.05	0.11	0.66	0.05
		cv	1.27	39.31	5.92	7.02	36.05	3.31	1.85	17.82	3.66
	1.0	1	7.90	2.64	1.49	6.93	1.87	1.53	6.06	4.65	1.29
		2	7.81	4.27	1.38	7.15	2.70	1.47	5.95	4.91	1.26
		3	7.69	3.18	1.45	6.57	2.22	1.49	7.57	4.35	1.37
		x	7.80	3.36	1.44	6.88	2.26	1.50	6.53	4.64	1.31
		s	0.11	0.83	0.06	0.29	0.42	0.03	0.91	0.28	0.06
		cv	1.35	24.69	3.87	4.25	18.41	2.04	13.87	6.04	4.35
	3.0	1	7.03	2.06	1.51	7.23	1.98	1.52	6.18	3.92	1.34
		2	7.69	4.54	1.36	7.57	2.54	1.49	6.29	3.20	1.40
		3	7.13	3.60	1.40	8.37	2.48	1.51	6.52	4.94	1.29
		x	7.28	3.40	1.42	7.72	2.33	1.51	6.33	4.02	1.34
		s	0.36	1.25	0.08	0.59	0.31	0.02	0.17	0.87	0.06
		cv	4.88	36.82	5.46	7.58	13.18	1.01	2.74	21.75	4.10
	5.0	1	8.05	4.19	1.39	6.57	3.58	1.38	6.52	4.03	1.35
		2	7.81	3.36	1.44	6.90	1.87	1.53	6.39	5.21	1.27
		3	8.02	2.83	1.48	6.67	2.86	1.44	5.73	4.09	1.31
		x	7.96	3.46	1.44	6.71	2.77	1.45	6.21	4.44	1.31
		s	0.13	0.69	0.05	0.17	0.86	0.08	0.42	0.66	0.04
		cv	1.64	19.81	3.14	2.52	30.99	5.21	6.82	14.96	3.05

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 527.4 Chl a Mg/m3	TRM 527.4 Pheo a Mg/m3	TRM 527.4 Pheo Index	TRM 528.0 Chl a Mg/m3	TRM 528.0 Pheo a Mg/m3	TRM 528.0 Pheo Index	TRM 529.5 Chl a Mg/m3	TRM 529.5 Pheo a Mg/m3	TRM 529.5 Pheo Index
AUG83	0.3	1	4.11	2.19	1.38	5.61	4.35	1.28	4.82	3.04	1.34
		2	3.43	1.98	1.36	5.03	2.96	1.36	4.57	2.67	1.37
		3	3.43	0.61	1.58	4.25	2.11	1.41	3.92	2.91	1.30
		x	3.66	1.59	1.44	4.96	3.14	1.35	4.44	2.87	1.34
		s	0.39	0.86	0.12	0.68	1.13	0.07	0.46	0.19	0.04
		cv	10.74	53.85	8.45	13.75	36.01	4.86	10.47	6.53	2.63
	1.0	1	3.87	1.82	1.42	5.62	3.44	1.35	5.51	2.80	1.40
		2	3.63	1.44	1.45	4.60	2.22	1.41	4.94	1.87	1.47
		3	3.53	1.25	1.48	3.82	1.36	1.48	5.51	2.35	1.44
		x	3.68	1.50	1.45	4.68	2.34	1.41	5.32	2.34	1.44
		s	0.17	0.29	0.03	0.90	1.05	0.07	0.33	0.47	0.04
		cv	4.75	19.31	2.07	19.29	44.67	4.60	6.19	19.88	2.44
	3.0	1	4.11	1.74	1.44	5.40	2.62	1.41	5.61	3.44	1.35
		2	3.97	2.46	1.35	5.16	2.70	1.39	4.72	3.76	1.27
		3	3.75	1.63	1.43	4.28	2.11	1.41	4.74	4.22	1.24
		x	3.94	1.94	1.41	4.95	2.48	1.40	5.02	3.81	1.29
		s	0.18	0.45	0.05	0.59	0.32	0.01	0.51	0.39	0.06
		cv	4.60	23.20	3.51	11.92	12.92	0.82	10.12	10.30	4.42
	5.0	1	3.75	2.99	1.27	4.37	2.30	1.39	4.72	2.86	1.35
		2	3.99	1.55	1.46	4.06	2.19	1.38	4.54	2.67	1.37
		3	3.89	2.72	1.31	3.53	2.62	1.29	4.91	2.78	1.37
		x	3.88	2.42	1.35	3.99	2.37	1.35	4.72	2.77	1.36
		s	0.12	0.77	0.10	0.42	0.22	0.06	0.19	0.10	0.01
		cv	3.11	31.63	7.44	10.65	9.43	4.07	3.92	3.44	0.85

Appendix 5-F. (Continued)

NOV83	0.3	1	6.10	3.28	1.38	6.20	3.02	1.41	6.33	4.11	1.33
		2	5.62	2.08	1.47	6.66	2.86	1.44	6.21	3.47	1.38
		3	6.10	2.38	1.46	6.33	2.75	1.44	6.55	4.03	1.35
		x	5.94	2.58	1.44	6.40	2.88	1.43	6.36	3.87	1.35
		s	0.28	0.62	0.05	0.24	0.14	0.02	0.17	0.35	0.03
		cv	4.67	24.21	3.43	3.71	4.72	1.21	2.71	9.01	1.86
	1.0	1	3.16	1.60	1.40	6.32	2.75	1.44	6.20	4.38	1.31
		2	6.57	3.12	1.41	6.32	2.75	1.44	5.98	4.91	1.26
		3	5.99	2.64	1.43	6.21	2.56	1.45	6.67	3.76	1.37
		x	5.24	2.45	1.41	6.28	2.69	1.44	6.28	4.35	1.31
		s	1.82	0.78	0.02	0.06	0.11	0.01	0.35	0.58	0.06
		cv	34.82	31.67	1.08	1.01	4.08	0.40	5.61	13.23	4.19
	3.0	1	6.06	2.83	1.42	6.44	2.48	1.46	6.57	3.12	1.41
		2	5.86	2.46	1.44	6.44	2.48	1.46	5.86	2.46	1.44
		3	5.86	2.91	1.41	5.77	3.18	1.38	6.21	3.47	1.37
		x	5.93	2.73	1.42	6.22	2.71	1.43	6.21	3.02	1.41
		s	0.12	0.24	0.02	0.39	0.40	0.05	0.36	0.51	0.04
		cv	1.95	8.78	1.07	6.22	14.89	3.22	5.71	17.00	2.50
	5.0	1	5.28	2.43	1.42	6.11	2.83	1.42	6.42	2.94	1.43
		2	5.42	3.52	1.33	5.98	2.64	1.43	6.42	2.94	1.43
		3	5.79	2.00	1.49	6.33	2.75	1.44	6.44	3.84	1.36
		x	5.50	2.65	1.41	6.14	2.74	1.43	6.43	3.24	1.41
		s	0.26	0.78	0.08	0.18	0.10	0.01	0.01	0.52	0.04
		cv	4.79	29.57	5.68	2.88	3.48	0.70	0.18	16.04	2.87

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
FEB83	0.3	1	4.52	0.00	1.74
		2	3.63	0.00	1.78
		3	3.94	0.19	1.67
		x	4.03	0.06	1.73
		s	0.45	0.11	0.06
		cv	11.21	173.2	3.22
	1.0	1	4.16	0.11	1.68
		2	3.94	1.55	1.46
		3	3.85	1.36	1.48
		x	3.98	1.01	1.54
		s	0.16	0.78	0.12
		cv	4.00	77.71	7.90
	3.0	1	3.75	0.00	1.83
		2	3.40	1.07	1.50
		3	3.63	0.00	1.78
		x	3.59	0.36	1.70
		s	0.18	0.62	0.18
		cv	4.95	173.2	10.44
	5.0	1	3.73	0.00	1.74
		2	3.72	0.00	1.74
		3	3.73	3.44	1.22
		x	3.73	1.15	1.57
		s	0.01	1.99	0.30
		cv	0.15	173.2	19.16

Appendix 5-F. (Continued)

JUN83	0.3	1	10.82	4.78	1.43
		2	8.65	4.86	1.37
		3	9.15	2.88	1.50
		x	9.54	4.17	1.43
		s	1.14	1.12	0.07
		cv	11.91	26.86	4.54
	1.0	1	10.61	4.41	1.45
		2	10.49	4.22	1.45
		3	10.12	4.11	1.45
		x	10.41	4.25	1.45
		s	0.26	0.15	0.00
		cv	2.45	3.57	0.00
	3.0	1	9.33	5.07	1.38
		2	9.45	4.81	1.40
		3	8.54	4.22	1.41
		x	9.11	4.70	1.40
		s	0.49	0.44	0.02
		cv	5.43	9.27	1.09
	5.0	1	9.46	6.17	1.33
		2	8.97	4.06	1.43
		3	8.65	5.31	1.35
		x	9.03	5.18	1.37
		s	0.41	1.06	0.05
		cv	4.52	20.48	3.86

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
AUG83	0.3	1	11.09	2.43	1.56
		2	9.73	1.09	1.62
		3	9.61	1.36	1.60
		x	10.14	1.63	1.59
		s	0.82	0.71	0.03
		cv	8.10	43.57	1.92
	1.0	1	11.66	2.00	1.58
		2	10.20	1.39	1.61
		3	10.66	1.23	1.62
		x	10.84	1.54	1.60
		s	0.75	0.41	0.02
		cv	6.89	26.38	1.30
	3.0	1	13.04	1.52	1.62
		2	12.36	1.76	1.60
		3	11.90	1.47	1.62
		x	12.43	1.58	1.61
		s	0.57	0.16	0.01
		cv	4.61	9.79	0.72
	5.0	1	13.50	2.27	1.59
		2	13.84	2.38	1.58
		3	14.18	2.48	1.58
		x	13.84	2.38	1.58
		s	0.34	0.11	0.01
		cv	2.46	4.42	0.36

Appendix 5-F. (Continued)

NOV83	0.3	1	7.81	2.91	1.47
		2	8.06	2.83	1.48
		3	6.59	4.94	1.29
		x	7.49	3.56	1.41
		s	0.79	1.20	0.11
		cv	10.51	33.59	7.57
	1.0	1	6.79	3.50	1.40
		2	6.20	3.02	1.41
		3	6.88	2.78	1.45
		x	6.62	3.10	1.42
		s	0.37	0.37	0.03
		cv	5.58	11.83	1.86
	3.0	1	6.30	2.30	1.47
		2	6.42	2.94	1.43
		3	6.54	2.67	1.45
		x	6.42	2.64	1.45
		s	0.12	0.32	0.02
		cv	1.87	12.19	1.38
	5.0	1	7.22	2.88	1.45
		2	7.11	2.70	1.47
		3	6.88	1.87	1.53
		x	7.07	2.48	1.48
		s	0.17	0.54	0.04
		cv	2.45	21.69	2.81

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 496.5 Chl a Mg/m3	TRM 496.5 Pheo a Mg/m3	TRM 496.5 Pheo Index	TRM 506.6 Chl a Mg/m3	TRM 506.6 Pheo a Mg/m3	TRM 506.6 Pheo Index	TRM 518.0 Chl a Mg/m3	TRM 518.0 Pheo a Mg/m3	TRM 518.0 Pheo Index
Feb. 1984	0.3	1	6.79	0.32	1.67	8.28	1.39	1.59	11.56	0.45	1.67
		2	7.37	1.71	1.55	8.28	0.93	1.62	10.10	1.66	1.59
		3	7.25	1.52	1.56	8.05	1.01	1.61	10.22	1.39	1.61
		X	7.14	1.18	1.59	8.20	1.11	1.61	10.63	1.17	1.62
		S	0.31	0.75	0.07	0.13	0.25	0.02	0.81	0.64	0.04
		CV	4.29	63.69	4.18	1.62	22.14	0.95	7.63	54.44	2.56
	1.0	1	7.35	0.35	1.67	8.61	1.95	1.55	11.12	1.07	1.63
		2	7.23	0.61	1.64	8.05	1.92	1.54	7.48	0.99	1.61
		3	6.76	0.77	1.62	8.95	0.69	1.65	11.03	1.34	1.62
		X	7.11	0.58	1.64	8.54	1.52	[illegible]	9.88	1.13	1.62
		S	0.31	0.21	0.03	0.45	0.72	0.06	2.08	0.18	0.01
		CV	4.38	36.76	1.53	5.32	47.30	3.85	21.02	16.18	0.62
	3.0	1	7.11	0.43	1.66	8.05	1.92	1.54	8.25	0.48	1.66
		2	7.13	1.33	1.58	9.32	1.25	1.61	10.34	1.58	1.60
		3	7.25	1.07	1.60	8.84	1.42	1.59	10.88	1.60	1.60
		X	7.16	0.94	1.61	8.74	1.53	1.58	9.82	1.22	1.62
		S	0.08	0.46	0.04	0.64	0.35	0.04	1.39	0.64	0.03
		CV	1.06	49.10	2.58	7.34	22.76	2.28	14.14	52.54	2.14
	5.0	1	7.69	1.36	1.58	7.60	1.63	1.56	10.20	1.39	1.61
		2	6.66	0.59	1.64	7.94	1.74	1.56	10.08	1.66	1.59
		3	7.47	1.44	1.57	8.96	1.60	1.58	11.01	1.79	1.59
		X	7.27	1.13	1.60	8.17	1.66	1.57	10.43	1.61	1.60
		S	0.54	0.47	0.04	0.71	0.07	0.01	0.51	0.20	0.01
		CV	7.46	41.54	2.37	8.67	4.45	0.74	4.85	12.65	0.72

Appendix 5-F. (Continued)

May 1984	0.3	1	2.79	1.04	1.47	1.78	1.17	1.33	4.18	1.47	1.48
		2	2.24	0.11	1.67	2.60	1.12	1.44	4.16	0.56	1.61
		3	2.34	0.75	1.50	2.36	1.20	1.40	4.29	2.11	1.41
		X	2.46	0.63	1.55	2.25	1.16	1.39	4.21	1.38	1.50
		S	0.29	0.48	0.11	0.42	0.04	0.06	0.07	0.78	0.10
		CV	11.93	75.13	6.97	18.76	3.47	4.01	1.66	56.44	6.77
	1.0	1	2.33	0.29	1.62	1.78	0.72	1.45	5.21	2.70	1.39
		2	2.45	0.03	1.69	2.02	0.19	1.64	4.60	1.31	1.52
		3	2.92	1.00	.	2.12	0.83	1.46	5.09	2.06	1.45
		X	2.57	0.44	1.66	1.97	0.58	1.52	4.97	2.02	1.45
		S	0.31	0.50	0.05	0.17	0.34	0.11	0.32	0.70	0.07
		CV	12.15	114.1	2.99	8.85	59.00	7.05	6.51	34.39	4.48
	3.0	1	2.35	0.29	1.62	1.90	1.36	1.31	4.75	1.95	1.45
		2	2.68	0.40	1.60	2.12	1.28	1.36	5.31	2.43	1.42
		3	2.92	0.77	1.53	1.90	1.36	1.31	5.31	1.98	1.47
		X	2.65	0.49	1.58	1.97	1.33	1.33	5.12	2.12	1.45
		S	0.29	0.25	0.05	0.13	0.05	0.03	0.32	0.27	0.03
		CV	10.80	51.67	2.98	6.44	3.46	2.18	6.31	12.68	1.74
	5.0	1	2.35	0.00	1.75	1.89	1.82	1.21	4.97	1.87	1.47
		2	2.35	0.29	1.62	2.23	1.01	1.43	4.99	3.23	1.33
		3	2.68	0.40	1.60	2.11	0.83	1.46	4.41	2.30	1.39
		X	2.46	0.23	1.66	2.08	1.22	1.37	4.79	2.47	1.40
		S	0.19	0.21	0.08	0.17	0.53	0.14	0.33	0.70	0.07
		CV	7.74	89.84	4.92	8.30	43.23	9.99	6.87	28.18	5.03

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 496.5 Chl a Mg/m3	TRM 496.5 Pheo a Mg/m3	TRM 496.5 Pheo Index	TRM 506.6 Chl a Mg/m3	TRM 506.6 Pheo a Mg/m3	TRM 506.6 Pheo Index	TRM 518.0 Chl a Mg/m3	TRM 518.0 Pheo a Mg/m3	TRM 518.0 Pheo Index
Aug. 1984	0.3	1	3.24	0.88	1.53	2.46	0.03	1.69	5.74	3.18	1.38
		2	2.14	0.83	1.46	2.35	1.66	1.31	5.62	2.08	1.47
		3	2.68	0.85	1.50	2.63	1.31	1.41	5.98	1.74	1.51
		X	2.69	0.85	1.50	2.50	1.00	1.47	5.78	2.33	1.45
		S	0.55	0.03	0.04	0.17	0.86	0.20	0.18	0.75	0.07
		CV	20.47	2.95	2.35	6.73	85.81	13.40	3.17	32.26	4.58
	1.0	1	3.02	0.51	1.59	2.67	1.76	1.33	5.74	3.18	1.38
		2	3.02	1.42	1.42	3.02	0.51	1.59	6.20	2.56	1.45
		3	2.91	0.32	1.63	3.35	1.52	1.43	4.60	1.76	1.46
		X	2.98	0.75	1.55	3.01	1.26	1.45	5.51	2.50	1.43
		S	0.06	0.59	0.11	0.34	0.66	0.13	0.82	0.71	0.04
		CV	2.13	78.40	7.21	11.28	52.51	9.04	14.94	28.48	3.05
	3.0	1	3.02	1.42	1.42	3.26	1.34	1.45	5.33	3.34	1.34
		2	3.14	0.69	1.56	3.02	1.87	1.35	5.64	1.63	1.52
		3	3.04	0.51	1.59	3.43	0.00	2.21	6.22	0.00	1.77
		X	3.07	0.87	1.52	3.24	1.07	1.67	5.73	1.66	1.54
		S	0.06	0.48	0.09	0.21	0.96	0.47	0.45	1.67	0.22
		CV	2.10	55.18	5.96	6.36	90.07	28.16	7.88	100.8	13.99
	5.0	1	2.82	0.00	1.92	3.13	2.06	1.33	5.64	2.54	1.43
		2	2.80	0.59	1.56	3.35	1.52	1.43	5.54	3.26	1.36
		3	2.70	1.76	1.33	3.25	0.88	1.53	5.30	1.98	1.47
		X	2.77	0.78	1.60	3.24	1.49	1.43	5.49	2.59	1.42
		S	0.06	0.90	0.30	0.11	0.59	0.10	0.17	0.64	0.06
		CV	2.32	114.4	18.55	3.40	39.73	6.99	3.18	24.74	3.92

Appendix 5-F. (Continued)

Nov. 1984	0.3	1	1.10	0.96	1.25	1.54	0.79	1.40	2.71	2.21	1.26
		2	1.22	0.24	1.57	1.54	0.00	2.80	3.26	2.23	1.32
		3	1.21	0.24	1.57	1.43	1.06	1.30	3.15	1.14	1.47
		X	1.18	0.48	1.46	1.50	0.62	1.83	3.04	1.86	1.35
		S	0.07	0.42	0.18	0.06	0.55	0.84	0.29	0.62	0.11
		CV	5.66	86.60	12.63	4.22	89.33	45.74	9.57	33.53	8.01
	1.0	1	1.20	0.69	1.38	1.11	1.40	1.11	3.02	1.41	1.42
		2	1.22	0.24	1.57	1.42	1.05	1.30	2.80	1.04	1.47
		3	1.44	0.16	1.63	1.53	0.00	1.75	3.14	1.59	1.40
		X	1.29	0.36	1.53	1.35	0.82	1.39	2.99	1.35	1.43
		S	0.13	0.29	0.13	0.22	0.73	0.33	0.17	0.28	0.04
		CV	10.35	78.64	8.55	16.09	89.21	23.70	5.77	20.82	2.52
	3.0	1	1.54	0.80	1.40	1.20	0.68	1.38	2.48	1.83	1.29
		2	1.42	0.16	1.63	1.52	0.79	1.40	2.80	1.93	1.32
		3	1.42	1.52	1.18	1.55	1.24	1.27	2.80	1.93	1.32
		X	1.46	0.83	1.40	1.42	0.90	1.35	2.69	1.90	1.31
		S	0.07	0.68	0.23	0.19	0.30	0.07	0.18	0.06	0.02
		CV	4.75	82.31	16.03	13.63	32.85	5.19	6.86	3.04	1.32
	5.0	1	1.20	0.69	1.38	1.42	1.49	1.18	2.89	1.67	1.37
		2	1.22	0.69	1.38	1.74	0.26	1.60	3.01	2.30	1.29
		3	1.42	0.61	1.44	1.42	1.05	1.30	3.24	1.77	1.38
		X	1.28	0.66	1.40	1.53	0.93	1.36	3.05	1.91	1.35
		S	0.12	0.05	0.03	0.18	0.62	0.22	0.18	0.34	0.05
		CV	9.50	6.96	2.47	12.10	66.78	15.91	5.84	17.70	3.66

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 527.4 Chl a Mg/m3	TRM 527.4 Pheo a Mg/m3	TRM 527.4 Pheo Index	TRM 528.0 Chl a Mg/m3	TRM 528.0 Pheo a Mg/m3	TRM 528.0 Pheo Index	TRM 529.5 Chl a Mg/m3	TRM 529.5 Pheo a Mg/m3	TRM 529.5 Pheo Index
Feb. 1984	0.3	1	13.05	1.07	1.64	12.39	2.22	1.58	11.81	1.74	1.60
		2	13.05	1.07	1.64	13.87	1.92	1.61	12.49	2.40	1.57
		3	13.17	1.71	1.61	12.39	1.76	1.60	12.73	1.42	1.62
		X	13.09	1.28	1.63	12.88	1.97	1.60	12.34	1.85	1.60
		S	0.07	0.37	0.02	0.85	0.23	0.02	0.48	0.50	0.03
		CV	0.53	28.79	1.06	6.63	11.87	0.96	3.87	26.96	1.58
	1.0	1	13.05	1.52	1.62	12.96	2.70	1.56	11.59	1.82	1.59
		2	13.51	1.36	1.63	11.71	1.55	1.61	11.81	0.83	1.65
		3	13.85	1.47	1.63	12.83	2.51	1.57	11.95	2.38	1.57
		X	13.47	1.45	1.63	12.50	2.25	1.58	11.78	1.68	1.60
		S	0.40	0.08	0.01	0.69	0.62	0.03	0.18	0.78	0.04
		CV	2.98	5.65	0.35	5.50	27.36	1.67	1.54	46.81	2.60
	3.0	1	12.39	1.76	1.60	12.86	2.06	1.59	6.82	2.14	1.50
						13.19	1.71	1.61	11.93	1.92	1.59
		3	13.19	1.71	1.61	13.07	2.43	1.58	12.26	1.12	1.64
		X	12.79	1.74	1.61	13.04	2.07	1.59	10.34	1.73	1.58
		S	0.57	0.04	0.01	0.17	0.36	0.02	3.05	0.54	0.07
		CV	4.42	2.04	0.44	1.28	17.42	0.96	29.51	31.09	4.50
	5.0	1	13.85	1.47	1.63	12.15	1.84	1.60	14.78	2.06	1.60
		2	13.31	2.35	1.58	12.26	1.58	1.61	11.37	0.99	1.64
		3	13.63	2.00	1.60	13.39	2.08	1.59	13.41	2.08	1.59
		X	13.60	1.94	1.60	12.60	1.83	1.60	13.19	1.71	1.61
		S	0.27	0.44	0.03	0.69	0.25	0.01	1.72	0.62	0.03
		CV	2.00	22.84	1.57	5.45	13.64	0.62	13.01	36.47	1.64

Appendix 5-F. (Continued)

May 1984	0.3	1	5.99	2.19	1.47	6.67	2.40	1.48	4.74	1.04	1.56
		2	5.99	2.19	1.47	6.93	1.87	1.53	5.04	2.51	1.41
		3	7.01	2.51	1.48	5.45	1.25	1.55	5.52	2.35	1.44
		X	6.33	2.30	1.47	6.35	1.84	1.52	5.10	1.97	1.47
		S	0.59	0.18	0.01	0.79	0.58	0.04	0.39	0.81	0.08
		CV	9.30	8.04	0.39	12.44	31.28	2.37	7.71	41.01	5.40
	1.0	1	5.55	0.99	1.58	7.47	2.80	1.47	4.96	1.87	1.47
		2	6.13	2.83	1.42	7.12	0.88	1.62	4.75	1.95	1.45
		3	6.69	1.04	1.59	7.01	2.51	1.48	4.28	2.56	1.36
		X	6.12	1.62	1.53	7.20	2.06	1.52	4.66	2.13	1.43
		S	0.57	1.05	0.10	0.24	1.04	0.08	0.35	0.38	0.06
		CV	9.31	64.70	6.23	3.34	50.16	5.51	7.47	17.75	4.11
	3.0	1	6.35	2.30	1.47	6.78	1.68	1.54	3.40	1.52	1.43
		2	6.35	1.84	1.51	7.23	1.52	1.56	4.98	2.32	1.42
		3	6.11	1.92	1.50	6.45	2.48	1.46	5.20	0.00	1.70
		X	6.27	2.02	1.49	6.82	1.89	1.52	4.53	1.28	1.52
		S	0.14	0.25	0.02	0.39	0.51	0.05	0.98	1.18	0.16
		CV	2.21	12.17	1.39	5.74	27.17	3.48	21.69	92.07	10.47
	5.0	1	6.89	1.87	1.53	6.52	2.67	1.45	5.31	1.38	1.47
		2	7.12	3.15	1.43	6.92	1.42	1.56	4.98	2.78	1.38
		3	6.11	2.83	1.42	6.13	1.47	1.54	4.64	1.31	1.52
		X	6.71	2.62	1.46	6.52	1.85	1.52	4.98	1.82	1.46
		S	0.53	0.67	0.06	0.40	0.71	0.06	0.34	0.83	0.07
		CV	7.89	25.46	4.17	6.06	38.19	3.86	6.73	45.48	4.87

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 527.4 Chl a Mg/m3	TRM 527.4 Pheo a Mg/m3	TRM 527.4 Pheo Index	TRM 528.0 Chl a Mg/m3	TRM 528.0 Pheo a Mg/m3	TRM 528.0 Pheo Index	TRM 529.5 Chl a Mg/m3	TRM 529.5 Pheo a Mg/m3	TRM 529.5 Pheo Index
Aug. 1984	0.3	1	6.20	0.75	1.62	5.55	1.44	1.53	5.83	0.19	1.68
		2	5.88	0.64	1.63	6.20	1.66	1.53	5.28	0.16	1.68
		3	5.74	2.27	1.46	6.78	1.68	1.54	6.42	1.12	1.58
		X	5.94	1.22	1.57	6.18	1.59	1.53	5.84	0.49	1.65
		S	0.24	0.91	0.10	0.62	0.13	0.01	0.57	0.55	0.06
		CV	3.97	74.67	6.08	9.96	8.36	0.38	9.76	111.4	3.51
	1.0	1	5.28	0.16	1.68	7.57	2.99	1.46	5.15	1.79	1.48
		2	5.52	1.44	1.53	6.55	2.67	1.45	4.72	1.04	1.56
		3	5.42	1.71	1.50	7.23	3.34	1.42	5.52	1.90	1.48
		X	5.41	1.10	1.57	7.12	3.00	1.44	5.13	1.58	1.51
		S	0.12	0.83	0.10	0.52	0.34	0.02	0.40	0.47	0.05
		CV	2.23	75.05	6.14	7.30	11.17	1.44	7.80	29.68	3.07
	3.0	1	6.98	0.69	1.63	6.44	2.03	1.50	5.98	1.74	1.51
		2	5.52	1.44	1.53	6.44	2.03	1.50	4.38	0.48	1.63
		3	6.10	2.83	1.42	6.30	2.30	1.47	6.40	2.03	1.50
		X	6.20	1.65	1.53	6.39	2.12	1.49	5.59	1.42	1.55
		S	0.74	1.09	0.11	0.08	0.16	0.02	1.07	0.82	0.07
		CV	11.86	65.68	6.88	1.26	7.35	1.16	19.08	58.17	4.68
	5.0	1	5.20	1.79	1.48	6.64	3.31	1.40	5.54	1.44	1.53
		2	6.88	0.05	1.69	6.54	2.67	1.45	4.62	1.31	1.52
		3	6.78	1.23	1.58	6.52	1.31	1.57	4.74	1.95	1.45
		X	6.29	1.02	1.58	6.57	2.43	1.47	4.97	1.57	1.50
		S	0.94	0.89	0.11	0.06	1.02	0.09	0.50	0.34	0.04
		CV	14.99	86.80	6.63	0.98	42.03	5.93	10.07	21.59	2.91

Appendix 5-F. (Continued)

Nov. 1984	0.3	1	4.25	2.54	1.36	3.96	1.55	1.46	3.22	2.22	1.32
		2	3.79	1.35	1.48	3.72	0.72	1.57	3.46	1.69	1.41
		3	3.69	1.17	1.50	4.74	4.22	1.24	3.56	1.87	1.39
		X	3.91	1.69	1.45	4.14	2.16	1.42	3.41	1.93	1.37
		S	0.30	0.74	0.08	0.53	1.83	0.17	0.17	0.27	0.05
		CV	7.64	44.14	5.23	12.88	84.54	11.81	5.12	13.99	3.44
	1.0	1	3.57	2.32	1.33	3.50	2.16	1.35	3.43	0.34	1.63
		2	3.88	1.53	1.46	3.59	0.08	1.68	4.44	2.90	1.33
		3	3.89	1.53	1.46	4.37	2.29	1.39	4.45	2.90	1.33
		X	3.78	1.79	1.42	3.82	1.51	1.47	4.11	2.05	1.43
		S	0.18	0.46	0.08	0.48	1.24	0.18	0.59	1.48	0.17
		CV	4.81	25.43	5.30	12.52	82.13	12.22	14.27	72.22	12.11
	3.0	1	3.77	1.34	1.48	3.25	2.23	1.32	3.76	0.89	1.55
		2	3.89	0.63	1.59	3.59	2.34	1.33	3.78	0.45	1.62
		3	3.75	2.69	1.31	4.04	0.37	1.64	4.90	3.18	1.33
		X	3.80	1.55	1.46	3.63	1.65	1.43	4.15	1.51	1.50
		S	0.08	1.05	0.14	0.40	1.11	0.18	0.65	1.47	0.15
		CV	1.99	67.37	9.66	10.93	67.23	12.72	15.74	97.28	10.09
	5.0	1	3.76	0.45	1.62	3.60	0.53	1.60	4.31	1.36	1.50
		2	3.43	1.68	1.41	3.68	2.07	1.38	3.54	0.97	1.52
		3	3.64	0.71	1.57	4.05	0.82	1.57	4.44	2.89	1.33
		X	3.61	0.95	1.53	3.78	1.14	1.52	4.10	1.74	1.45
		S	0.17	0.65	0.11	0.24	0.82	0.12	0.49	1.01	0.10
		CV	4.63	68.48	7.15	6.36	71.79	7.87	11.87	58.32	7.20

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
Feb. 1984	0.3	1	14.90	1.34	1.64
		2	14.56	1.68	1.62
		3	13.75	1.28	1.64
		X	14.40	1.43	1.63
		S	0.59	0.22	0.01
		CV	4.10	15.05	0.71
	1.0	1	14.80	1.60	1.63
		2	14.00	1.20	1.64
		3	14.68	1.87	1.61
		X	14.49	1.56	1.63
		S	0.43	0.34	0.02
		CV	2.98	21.65	0.94
	3.0	1	14.68	1.42	1.63
		2	15.46	1.36	1.64
		3	14.43	1.50	1.63
		X	14.86	1.43	1.63
		S	0.54	0.07	0.01
		CV	3.62	4.92	0.35
	5.0	1	14.21	1.58	1.62
		2	12.29	1.58	1.61
		3	14.77	1.15	1.65
		X	13.76	1.44	1.63
		S	1.30	0.25	0.02
		CV	9.45	17.28	1.28

Appendix 5-F. (Continued)

May 1984	0.3	1	9.67	3.63	1.47
		2	10.09	3.02	1.51
		3	10.78	1.87	1.58
		X	10.18	2.84	1.52
		S	0.56	0.89	0.06
		CV	5.51	31.47	3.66
	1.0	1	11.71	1.55	1.61
		2	11.26	3.07	1.52
		3	10.78	4.14	1.46
		X	11.25	2.92	1.53
		S	0.47	1.30	0.08
		CV	4.13	44.57	4.93
	3.0	1	8.74	0.32	1.67
		2	11.34	0.08	1.69
		3	10.31	3.39	1.49
		X	10.13	1.26	1.62
		S	1.31	1.85	0.11
		CV	12.93	146.1	6.81
	5.0	1	8.83	2.32	1.53
		2	7.59	2.54	1.49
		3	11.12	3.34	1.51
		X	9.18	2.73	1.51
		S	1.79	0.54	0.02
		CV	19.51	19.64	1.32

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
Aug. 1984	0.3	1	9.97	1.01	1.63
		2	10.66	2.14	1.57
		3	10.19	0.48	1.67
		X	10.27	1.21	1.62
		S	0.35	0.85	0.05
		CV	3.43	70.07	3.10
	1.0	1	11.56	0.00	1.73
		2	10.19	0.03	1.70
		3	11.21	0.35	1.68
		X	10.99	0.13	1.70
		S	0.71	0.19	0.03
		CV	6.48	153.2	1.48
	3.0	1	12.36	1.31	1.63
		2	12.00	1.20	1.63
		3	12.02	1.20	1.63
		X	12.13	1.24	1.63
		S	0.20	0.06	0.00
		CV	1.67	5.14	0.00
	5.0	1	13.39	3.44	1.53
		2	11.90	1.92	1.59
		3	12.94	1.79	1.61
		X	12.74	2.38	1.58
		S	0.76	0.92	0.04
		CV	6.00	38.49	2.64

Appendix 5-F. (Continued)

Nov. 1984	0.3	1	4.73	1.95	1.45
		2	3.71	1.17	1.50
		3	4.64	1.76	1.46
		X	4.36	1.63	1.47
		S	0.56	0.41	0.03
		CV	12.95	25.00	1.80
	1.0	1	4.16	1.46	1.48
		2	4.38	0.93	1.56
		3	4.16	0.56	1.61
		X	4.23	0.98	1.55
		S	0.13	0.45	0.07
		CV	3.00	46.00	4.23
	3.0	1	5.05	2.04	1.45
		2	4.47	1.57	1.48
		3	5.15	2.23	1.44
		X	4.89	1.95	1.46
		S	0.37	0.34	0.02
		CV	7.51	17.45	1.43
	5.0	1	4.14	1.01	1.54
		2	4.13	1.46	1.48
		3	4.13	1.46	1.48
		X	4.13	1.31	1.50
		S	0.01	0.26	0.03
		CV	0.14	19.83	2.31

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 496.5 Chl a Mg/m3	TRM 496.5 Pheo a Mg/m3	TRM 496.5 Pheo Index	TRM 506.6 Chl a Mg/m3	TRM 506.6 Pheo a Mg/m3	TRM 506.6 Pheo Index	TRM 518.0 Chl a Mg/m3	TRM 518.0 Pheo a Mg/m3	TRM 518.0 Pheo Index
Feb. 1985	0.3	1	4.78	0.13	1.68	5.57	0.00	1.75	5.67	0.00	1.79
		2	4.89	0.32	1.65	5.77	0.45	1.65	5.45	0.00	1.71
		3	4.89	0.32	1.65	5.79	0.00	1.70	5.46	0.00	1.71
		x	4.85	0.26	1.66	5.71	0.15	1.70	5.53	0.00	1.74
		s	0.06	0.11	0.02	0.12	0.26	0.05	0.12	0.00	0.05
		CV	1.31	42.74	1.04	2.13	173.2	2.94	2.25	.	2.66
	1.0	1	4.79	0.13	1.68	5.46	0.00	1.78	4.90	0.32	1.65
		2	5.13	0.24	1.67	6.01	0.00	1.83	5.89	0.19	1.68
		3	4.79	0.59	1.62	6.04	0.00	1.77	5.33	0.00	1.81
		x	4.90	0.32	1.66	5.84	0.00	1.79	5.37	0.17	1.71
		s	0.20	0.24	0.03	0.33	0.00	0.03	0.50	0.16	0.09
		CV	4.00	75.07	1.94	5.59	.	1.79	9.24	94.67	4.96
	3.0	1	4.77	0.13	1.68	5.23	0.00	1.70	5.35	0.16	1.68
		2	4.33	0.00	1.73	5.57	0.00	1.81	6.81	0.32	1.67
		3	5.45	0.00	1.78	5.57	0.00	1.81	5.23	0.00	1.77
		x	4.85	0.04	1.73	5.46	0.00	1.77	5.80	0.16	1.71
		s	0.56	0.08	0.05	0.20	0.00	0.06	0.88	0.16	0.06
		CV	11.63	173.2	2.89	3.60	.	3.58	15.17	100	3.23
	5.0	1	5.47	0.35	1.66	5.92	0.00	1.79			
		2	5.47	0.35	1.66	5.89	0.00	1.73			
		3	5.58	0.08	1.69	5.57	0.08	1.69			
		x	5.51	0.26	1.67	5.79	0.03	1.74			
		s	0.06	0.16	0.02	0.19	0.05	0.05			
		CV	1.15	59.96	1.04	3.35	173.2	2.90			

Appendix 5-F. (Continued)

May 1985	0.3	1	10.00	1.00	1.76	40.80	1.00	1.80	12.90	2.70	1.56
		2	5.60	1.00	1.81	59.00	1.00	1.77	11.90	2.80	1.54
		3	9.10	1.00	1.86	63.60	1.00	1.78	13.70	2.60	1.57
		x	8.23	1.00	1.81	54.47	1.00	1.78	12.83	2.70	1.56
		s	2.32	0.00	0.05	12.06	0.00	0.02	0.90	0.10	0.02
		CV	28.23	0.00	2.76	22.14	0.00	0.86	7.03	3.70	0.98
	1.0	1	5.40	1.00	1.92	31.70	1.00	1.78	12.00	3.90	1.49
		2	7.10	1.00	1.88	36.20	1.00	1.80	14.50	4.00	1.52
		3	8.10	1.00	1.77	37.50	1.00	1.80	15.10	4.00	1.53
		x	6.87	1.00	1.86	35.13	1.00	1.79	13.87	3.97	1.51
		s	1.37	0.00	0.08	3.04	0.00	0.01	1.64	0.06	0.02
		CV	19.88	0.00	4.18	8.66	0.00	0.64	11.86	1.46	1.38
	3.0	1	4.20	1.00	1.85	12.00	1.20	1.63	10.50	2.90	1.52
		2	2.60	1.00	1.64	10.30	1.00	1.75	13.90	3.00	1.56
		3	4.10	1.00	1.89	11.50	1.00	1.68	8.60	1.90	1.55
		x	3.63	1.00	1.79	11.27	1.07	1.69	11.00	2.60	1.54
		s	0.90	0.00	0.13	0.87	0.12	0.06	2.69	0.61	0.02
		CV	24.67	0.00	7.49	7.75	10.83	3.57	24.41	23.40	1.35
	5.0	1	1.90	1.00	1.42	5.00	1.00	1.91	6.70	1.90	1.51
		2	2.30	1.00	1.82	4.50	1.00	1.90	7.80	2.00	1.53
		3	2.30	1.00	1.67	5.70	1.00	1.61	12.40	2.70	1.56
		x	2.17	1.00	1.64	5.07	1.00	1.81	8.97	2.20	1.53
		s	0.23	0.00	0.20	0.60	0.00	0.17	3.02	0.44	0.03
		CV	10.66	0.00	12.35	11.90	0.00	9.43	33.72	19.81	1.64

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 496.5 Chl a Mg/m3	TRM 496.5 Pheo a Mg/m3	TRM 496.5 Pheo Index	TRM 506.6 Chl a Mg/m3	TRM 506.6 Pheo a Mg/m3	TRM 506.6 Pheo Index	TRM 518.0 Chl a Mg/m3	TRM 518.0 Pheo a Mg/m3	TRM 518.0 Pheo Index
Aug. 1985	0.3	1	6.20	1.00	1.67	2.90	1.20	1.44	4.90	1.70	1.48
		2	3.70	1.00	1.57	3.00	1.40	1.42	5.10	1.00	1.73
		3	6.40	1.00	1.73	3.00	1.00	1.59	5.70	1.00	1.65
		x	5.43	1.00	1.66	2.97	1.20	1.48	5.23	1.23	1.62
		s	1.50	0.00	0.08	0.06	0.20	0.09	0.42	0.40	0.13
		CV	27.69	0.00	4.88	1.95	16.67	6.26	7.96	32.77	7.88
	1.0	1	5.80	1.00	1.65	3.30	1.00	1.53	5.10	1.10	1.55
		2	6.20	1.00	1.62	3.40	1.10	1.50	4.80	1.00	1.62
		3	6.00	1.00	1.71	3.60	1.00	1.52	5.40	1.00	1.60
		x	6.00	1.00	1.66	3.43	1.03	1.52	5.10	1.03	1.59
		s	0.20	0.00	0.05	0.15	0.06	0.02	0.30	0.06	0.04
		CV	3.33	0.00	2.76	4.45	5.59	1.01	5.88	5.59	2.27
	3.0	1	3.20	1.00	1.56	3.60	1.40	1.45	5.00	1.00	1.69
		2	3.00	1.00	1.69	3.70	1.20	1.50	5.20	1.30	1.53
		3	3.60	1.00	1.60	3.10	1.00	1.80	5.40	1.00	1.66
		x	3.27	1.00	1.62	3.47	1.20	1.58	5.20	1.10	1.63
		s	0.31	0.00	0.07	0.32	0.20	0.19	0.20	0.17	0.09
		CV	9.35	0.00	4.12	9.27	16.67	11.96	3.85	15.75	5.23
	5.0	1	3.50	1.70	1.41	2.90	1.00	1.67	5.00	1.90	1.47
		2	3.40	1.00	1.67	4.00	1.30	1.50	4.90	1.00	1.59
		3	2.80	1.00	1.47	3.80	1.00	1.55	5.90	1.50	1.53
		x	3.23	1.23	1.52	3.57	1.10	1.57	5.27	1.47	1.53
		s	0.38	0.40	0.14	0.59	0.17	0.09	0.55	0.45	0.06
		CV	11.71	32.77	8.98	16.43	15.75	5.55	10.46	30.74	3.92

Appendix 5-F. (Continued)

Nov.1985	0.3	1	1.50	1.10	1.30	1.50	1.00	1.44	3.60	1.40	1.45
		2	1.50	1.00	1.44	1.50	1.00	1.44	3.40	2.00	1.36
		3	1.30	1.30	1.20	1.40	1.00	1.50	3.50	1.30	1.48
		x	1.43	1.13	1.31	1.47	1.00	1.46	3.50	1.57	1.43
		s	0.12	0.15	0.12	0.06	0.00	0.03	0.10	0.38	0.06
		CV	8.06	13.48	9.18	3.94	0.00	2.37	2.86	24.17	4.37
	1.0	1	1.60	2.20	1.08	1.60	1.30	1.27	3.30	1.80	1.38
		2	1.50	1.00	1.44	1.50	1.00	1.44	3.40	1.50	1.43
		3	1.40	1.00	1.33	1.50	1.00	1.44	3.70	1.60	1.43
		x	1.50	1.40	1.28	1.53	1.10	1.38	3.47	1.63	1.41
		s	0.10	0.69	0.18	0.06	0.17	0.10	0.21	0.15	0.03
		CV	6.67	49.49	14.38	3.77	15.75	7.10	6.00	9.35	2.04
	3.0	1	1.50	1.00	1.44	1.80	1.20	1.33	3.40	1.10	1.50
		2	1.60	1.00	1.40	1.80	1.00	1.60	3.80	2.50	1.32
		3	1.60	1.00	1.40	4.50	1.00	3.50	3.60	2.30	1.33
		x	1.57	1.00	1.41	2.70	1.07	2.14	3.60	1.97	1.38
		s	0.06	0.00	0.02	1.56	0.12	1.18	0.20	0.76	0.10
		CV	3.69	0.00	1.63	57.74	10.83	55.18	5.56	38.50	7.31
	5.0	1	1.80	1.00	1.45	1.60	1.30	1.27	3.40	2.00	1.36
		2	1.30	1.00	1.33	1.50	1.10	1.30	3.00	2.10	1.30
		3	1.40	1.30	1.20	2.00	1.50	1.29	3.80	2.50	1.32
		x	1.50	1.10	1.33	1.70	1.30	1.29	3.40	2.20	1.33
		s	0.26	0.17	0.13	0.26	0.20	0.02	0.40	0.26	0.03
		CV	17.64	15.75	9.42	15.56	15.38	1.19	11.76	12.03	2.30

Appendix 5-F. (Continued)

			TRM 527.4			TRM 528.0			TRM 529.5		
Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
Feb. 1985	0.3	1	5.11	0.24	1.67	5.02	0.51	1.63	5.67	0.27	1.67
		2	5.13	0.69	1.61	5.13	0.24	1.67	5.45	0.00	1.71
		3	5.24	0.43	1.64	5.24	0.00	1.70	5.57	0.08	1.69
		x	5.16	0.45	1.64	5.13	0.25	1.67	5.56	0.12	1.69
		s	0.07	0.23	0.03	0.11	0.26	0.04	0.11	0.14	0.02
		CV	1.36	49.83	1.83	2.14	102.1	2.11	1.98	118.9	1.18
	1.0	1	5.01	0.51	1.63	4.78	0.13	1.68	5.58	0.08	1.69
		2	5.23	0.43	1.64	5.02	0.51	1.63	5.23	0.43	1.64
		3	5.24	0.43	1.64	5.14	0.69	1.61	5.48	0.00	1.71
		x	5.16	0.46	1.64	4.98	0.44	1.64	5.43	0.17	1.68
		s	0.13	0.05	0.01	0.18	0.29	0.04	0.18	0.23	0.04
		CV	2.52	10.11	0.35	3.68	64.49	2.20	3.32	134.5	2.15
	3.0	1	5.11	0.00	1.73	5.01	0.05	1.69	5.26	0.00	1.70
		2	5.24	0.00	1.70	5.01	0.05	1.69	5.35	0.16	1.68
		3	5.01	0.51	1.63	2.72	1.76	1.33	5.46	0.00	1.71
		x	5.12	0.17	1.69	4.25	0.62	1.57	5.36	0.05	1.70
		s	0.12	0.29	0.05	1.32	0.99	0.21	0.10	0.09	0.02
		CV	2.25	173.2	3.04	31.13	159.2	13.24	1.87	173.2	0.90
	5.0	1	5.24	0.43	1.64	5.24	0.43	1.64	5.14	0.69	1.61
		2	5.35	0.16	1.68	5.23	0.00	1.70	5.46	0.35	1.66
		3	5.48	0.35	1.66	5.23	0.00	1.70	5.48	0.80	1.60
		x	5.36	0.31	1.66	5.23	0.14	1.68	5.36	0.61	1.62
		s	0.12	0.14	0.02	0.01	0.25	0.03	0.19	0.23	0.03
		CV	2.24	44.26	1.20	0.11	173.2	2.06	3.56	38.25	1.98

Appendix 5-F. (Continued)

May 1985	0.3	1	5.10	1.60	1.50	5.60	1.90	1.48	4.80	1.70	1.48
		2	5.70	2.50	1.43	5.10	1.60	1.50	3.60	1.40	1.45
		3	5.20	1.80	1.48	6.10	1.90	1.50	4.50	1.10	1.54
		x	5.33	1.97	1.47	5.60	1.80	1.49	4.30	1.40	1.49
		s	0.32	0.47	0.04	0.50	0.17	0.01	0.62	0.30	0.05
		CV	6.03	24.03	2.45	8.93	9.62	0.77	14.52	21.43	3.08
	1.0	1	5.60	2.30	1.44	5.80	2.30	1.46	5.90	1.00	1.62
		2	6.00	2.20	1.47	4.70	1.50	1.50	5.90	2.00	1.49
		3	6.60	3.10	1.41	5.60	2.30	1.44	6.10	2.40	1.46
		x	6.07	2.53	1.44	5.37	2.03	1.47	5.97	1.80	1.52
		s	0.50	0.49	0.03	0.59	0.46	0.03	0.12	0.72	0.09
		CV	8.30	19.47	2.08	10.92	22.72	2.08	1.94	40.06	5.58
	3.0	1	7.10	1.30	1.57	6.50	2.00	1.50	5.70	2.50	1.43
		2	6.60	1.30	1.57	5.70	2.50	1.43	5.60	1.00	1.58
		3	6.90	1.40	1.56	6.70	2.40	1.48	5.00	2.30	1.42
		x	6.87	1.33	1.57	6.30	2.30	1.47	5.43	1.93	1.48
		s	0.25	0.06	0.01	0.53	0.26	0.04	0.38	0.81	0.09
		CV	3.66	4.33	0.37	8.40	11.50	2.45	6.97	42.13	6.07
	5.0	1	6.60	2.70	1.45	6.10	1.90	1.50	5.80	1.40	1.55
		2	6.50	2.50	1.46	6.50	2.50	1.46	5.70	2.10	1.47
		3	6.30	2.60	1.45	6.50	2.90	1.43	4.70	1.00	1.56
		x	6.47	2.60	1.45	6.37	2.43	1.46	5.40	1.50	1.53
		s	0.15	0.10	0.01	0.23	0.50	0.04	0.61	0.56	0.05
		CV	2.36	3.85	0.40	3.63	20.68	2.40	11.26	37.12	3.23

Appendix 5-F. (Continued)

Date	Depth (m)	Sample No.	TRM 527.4 Chl a Mg/m3	TRM 527.4 Pheo a Mg/m3	TRM 527.4 Pheo Index	TRM 528.0 Chl a Mg/m3	TRM 528.0 Pheo a Mg/m3	TRM 528.0 Pheo Index	TRM 529.5 Chl a Mg/m3	TRM 529.5 Pheo a Mg/m3	TRM 529.5 Pheo Index
Aug. 1985	0.3	1	7.70	1.00	1.66	9.30	1.70	1.58	14.10	1.00	1.67
		2	8.10	1.00	1.69	5.70	1.00	1.65	11.80	1.00	1.65
		3	8.40	1.10	1.61	8.10	1.20	1.60	12.10	1.00	1.73
		x	8.07	1.03	1.65	7.70	1.30	1.61	12.67	1.00	1.68
		s	0.35	0.06	0.04	1.83	0.36	0.04	1.25	0.00	0.04
		CV	4.35	5.59	2.44	23.81	27.74	2.24	9.87	0.00	2.47
	1.0	1	7.10	1.00	1.62	8.90	1.60	1.58	14.60	1.00	1.68
		2	8.60	1.00	1.62	7.90	1.30	1.59	12.50	1.00	1.64
		3	7.00	1.10	1.59	9.20	1.50	1.59	12.90	1.00	1.70
		x	7.57	1.03	1.61	8.67	1.47	1.59	13.33	1.00	1.67
		s	0.90	0.06	0.02	0.68	0.15	0.01	1.12	0.00	0.03
		CV	11.85	5.59	1.08	7.85	10.41	0.36	8.36	0.00	1.83
	3.0	1	7.00	1.60	1.55	7.10	1.00	1.62	9.70	1.50	1.59
		2	4.60	1.30	1.52	7.20	1.00	1.64	7.20	1.00	1.64
		3	5.40	1.50	1.52	7.90	1.00	1.63	9.20	1.10	1.62
		x	5.67	1.47	1.53	7.40	1.00	1.63	8.70	1.20	1.62
		s	1.22	0.15	0.02	0.44	0.00	0.01	1.32	0.26	0.03
		CV	21.57	10.41	1.13	5.89	0.00	0.61	15.21	22.05	1.56
	5.0	1	5.80	1.00	1.59	6.80	1.20	1.58	8.10	1.70	1.57
		2	6.50	1.80	1.53	9.50	1.20	1.62	7.70	1.40	1.58
		3	6.20	1.70	1.53	9.70	1.10	1.62	8.00	1.50	1.58
		x	6.17	1.50	1.55	8.67	1.17	1.61	7.93	1.53	1.58
		s	0.35	0.44	0.03	1.62	0.06	0.02	0.21	0.15	0.01
		CV	5.69	29.06	2.23	18.69	4.95	1.44	2.62	9.96	0.37

Appendix 5-F. (Continued)

Nov.1985	0.3	1	6.20	1.20	1.57	6.70	1.00	1.59	5.90	2.00	1.49
		2	5.90	1.50	1.53	6.10	1.50	1.54	5.90	2.00	1.49
		3	5.90	1.50	1.53	6.00	1.70	1.51	5.90	2.00	1.49
		x	6.00	1.40	1.54	6.27	1.40	1.55	5.90	2.00	1.49
		s	0.17	0.17	0.02	0.38	0.36	0.04	0.00	0.00	0.00
		CV	2.89	12.37	1.50	6.04	25.75	2.61	0.00	0.00	0.00
	1.0	1	5.90	1.50	1.53	6.20	1.70	1.53	6.00	2.20	1.47
		2	5.80	1.40	1.55	4.90	2.10	1.43	6.00	2.20	1.47
		3	6.00	1.70	1.51	6.60	1.90	1.51	6.00	1.70	1.51
		x	5.90	1.53	1.53	5.90	1.90	1.49	6.00	2.03	1.48
		s	0.10	0.15	0.02	0.89	0.20	0.05	0.00	0.29	0.02
		CV	1.69	9.96	1.31	15.06	10.53	3.55	0.00	14.20	1.56
	3.0	1	6.20	2.10	1.49	6.10	2.40	1.46	5.90	2.50	1.44
		2	6.00	1.70	1.51	6.10	1.90	1.50	5.00	1.40	1.52
		3	5.80	2.30	1.46	6.60	1.80	1.53	6.40	1.80	1.51
		x	6.00	2.03	1.49	6.27	2.03	1.50	5.77	1.90	1.49
		s	0.20	0.31	0.03	0.29	0.32	0.04	0.71	0.56	0.04
		CV	3.33	15.02	1.69	4.61	15.81	2.35	12.30	29.30	2.93
	5.0	1	6.70	1.90	1.51	6.20	1.20	1.57	6.10	1.90	1.50
		2	6.10	1.00	1.59	5.90	1.50	1.53	5.10	1.60	1.50
		3	7.30	1.50	1.56	6.20	1.70	1.53	6.40	2.30	1.47
		x	6.70	1.47	1.55	6.10	1.47	1.54	5.87	1.93	1.49
		s	0.60	0.45	0.04	0.17	0.25	0.02	0.68	0.35	0.02
		CV	8.96	30.74	2.60	2.84	17.16	1.50	11.60	18.16	1.16

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
Feb. 1985	0.3	1	3.16	4.33	1.08
		2	2.92	3.50	1.13
		3	3.28	4.06	1.12
		x	3.12	3.96	1.11
		s	0.18	0.42	0.03
		CV	5.88	10.68	2.38
	1.0	1	3.16	4.33	1.08
		2	2.95	4.41	1.04
		3	3.17	3.42	1.17
		x	3.09	4.05	1.10
		s	0.12	0.55	0.07
		CV	4.02	13.57	6.07
	3.0	1	2.95	3.95	1.08
		2	3.06	3.23	1.17
		x	3.01	3.59	1.13
		s	0.08	0.51	0.06
		CV	2.59	14.18	5.66
	5.0	1	4.97	0.05	1.69
		2	5.09	0.24	1.67
		3	4.89	0.77	1.59
		x	4.98	0.35	1.65
		s	0.10	0.37	0.05
		CV	2.02	105.6	3.21

Appendix 5-F. (Continued)

May 1985	0.3	1	13.00	1.00	1.73
		2	15.70	1.00	1.75
		3	14.90	1.00	1.70
		x	14.53	1.00	1.73
		s	1.39	0.00	0.03
		CV	9.54	0.00	1.46
	1.0	1	17.80	1.00	1.68
		2	16.10	1.00	1.70
		3	17.60	1.00	1.73
		x	17.17	1.00	1.70
		s	0.93	0.00	0.03
		CV	5.41	0.00	1.48
	3.0	1	14.60	1.00	1.71
		2	17.70	1.00	1.72
		3	14.80	1.00	1.71
		x	15.70	1.00	1.71
		s	1.73	0.00	0.01
		CV	11.05	0.00	0.34
	5.0	1	15.40	1.00	1.67
		2	16.50	1.20	1.65
		3	16.10	1.00	1.68
		x	16.00	1.07	1.67
		s	0.56	0.12	0.02
		CV	3.48	10.83	0.92

Appendix 5-F. (Continued)

TRM 532.1

Date	Depth (m)	Sample No.	Chl a Mg/m3	Pheo a Mg/m3	Pheo Index
Aug. 1985	0.3	1	16.70	1.00	1.75
		2	14.20	1.00	1.76
		3	14.90	1.00	1.72
		x	15.27	1.00	1.74
		s	1.29	0.00	0.02
		CV	8.45	0.00	1.19
	1.0	1	16.80	1.00	1.76
		2	15.30	1.00	1.75
		3	18.60	1.00	1.71
		x	16.90	1.00	1.74
		s	1.65	0.00	0.03
		CV	9.78	0.00	1.52
	3.0	1	20.00	1.00	1.73
		2	21.30	1.00	1.75
		3	18.10	1.00	1.69
		x	19.80	1.00	1.72
		s	1.61	0.00	0.03
		CV	8.13	0.00	1.77
	5.0	1	21.20	1.00	1.69
		2	21.10	1.00	1.69
		x	21.15	1.00	1.69
		s	0.07	0.00	0.00
		CV	0.33	0.00	0.00

Appendix 5-F. (Continued)

Nov.1985	0.3	1	5.60	2.30	1.44
		2	4.90	1.70	1.48
		3	5.90	2.00	1.49
		x	5.47	2.00	1.47
		s	0.51	0.30	0.03
		CV	9.39	15.00	1.80
	1.0	1	5.50	2.20	1.45
		2	5.70	1.20	1.56
		3	5.60	1.90	1.48
		x	5.60	1.77	1.50
		s	0.10	0.51	0.06
		CV	1.79	29.05	3.80
	3.0	1	8.10	1.00	2.24
		2	5.50	1.90	1.48
		3	5.80	1.80	1.50
		x	6.47	1.57	1.74
		s	1.42	0.49	0.43
		CV	22.00	31.49	24.89
	5.0	1	5.80	1.80	1.50
		2	5.40	1.70	1.50
		3	5.50	1.70	1.50
		x	5.57	1.73	1.50
		s	0.21	0.06	0.00
		CV	3.74	3.33	0.00

APPENDIX 5-G

HOURLY AND DAILY CARBON ASSIMILATION RATES AT EACH DEPTH BY LOCATION DURING PREOPERATIONAL MONITORING (1973-1977 AND 1982-1985), WATTS BAR NUCLEAR PLANT

Appendix 5-G. Hourly and Daily Carbon Assimilation Rates at each Depth by Location During Preoperational Monitoring (1973-1977 and 1982-1985), Watts Bar Nuclear Plant

		TRM 496.5		TRM 506.5		TRM 518.0	
Date	Depth	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb 73	0.3	6.04		12.32		18.58	
	1.0	3.20		11.79		14.73	
	3.0	0.25		1.55		1.35	
	5.0	0.05		0.45		0.80	
	Surface to 5.0 m		23		65		82
May 73	0.3	12.46		6.71		10.01	
	1.0	5.21		2.21		5.65	
	3.0	1.00		0.52		1.29	
	5.0	0.61		0.28		0.63	
	Surface to 5.0 m		87		42		87
Aug 73	0.3	17.54		12.72		37.98	
	1.0	12.39		9.64		27.42	
	3.0	1.59		2.58		5.24	
	5.0	0.62		1.06		2.05	
	Surface to 5.0 m		249		60		161
Nov 73	0.3	1.98		2.97		5.53	
	1.0	0.61		1.66		3.71	
	3.0	0.15		0.23		0.45	
	5.0	0.01		0.09		0.13	
	Surface to 5.0 m		2		57		118
Feb 74	0.3	3.98		2.16		3.45	
	1.0	1.32		0.49		0.70	
	3.0	0.04		0.07		0.12	
	5.0	0.01		0.05		0.07	
	Surface to 5.0 m		22		77		118

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
May 74	0.3	17.73		2.18		3.43	
	1.0	9.62		0.81		1.28	
	3.0	1.07		0.30		0.40	
	5.0	0.20		0.22		0.31	
	Surface to 5.0 m		66		4		7
Aug 74	0.3	8.82		5.50		9.79	
	1.0	4.32		3.45		7.70	
	3.0	0.64		1.19		2.49	
	5.0	0.17		0.41		0.95	
	Surface to 5.0 m		19		17		36
Nov 74	0.3	2.99		3.14		8.64	
	1.0	1.44		1.97		6.06	
	3.0	0.27		0.28		0.94	
	5.0	0.09		0.13		0.41	
	Surface to 5.0 m		4		20		59
May 75	0.3	11.91		16.62		12.26	
	1.0	9.64		16.75		12.28	
	3.0	0.97		8.09		5.11	
	5.0	0.08		3.17		1.37	
	Surface to 5.0 m		1		2		1
Aug. 75	0.3	15.70		13.69		13.63	
	1.0	7.78		8.38		8.67	
	3.0	1.21		2.61		2.55	
	5.0	0.39		0.84		1.16	
	Surface to 5.0 m		59		14		15

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Nov. 75	0.3	9.49		8.28		6.78	
	1.0	6.63		5.01		3.90	
	3.0	0.67		0.59		0.60	
	5.0	0.13		0.24		0.21	
	Surface to 5.0 m		67		61		50
Feb. 76	0.3	9.53		12.47		11.12	
	1.0	3.09		8.95		10.44	
	3.0	0.56		1.49		1.69	
	5.0	0.45		0.67		0.62	
	Surface to 5.0 m		6		61		67
May 76	0.3	11.07		2.59		4.03	
	1.0	6.01		2.78		3.31	
	3.0	0.59		0.52		0.51	
	5.0	0.37		0.17		0.28	
	Surface to 5.0 m		51		2		3
Aug. 76	0.3	17.89		17.71		24.47	
	1.0	13.81		13.65		19.93	
	3.0	2.68		4.03		5.51	
	5.0	1.01		1.56		1.74	
	Surface to 5.0 m		35		394		556
Nov. 76	0.3	4.04		5.69		9.73	
	1.0	3.25		4.95		9.09	
	3.0	0.72		1.14		1.91	
	5.0	0.36		0.37		0.64	
	Surface to 5.0 m		29		336		598

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 77	0.3	8.81		17.29		16.19	
	1.0	10.85		12.22		10.91	
	3.0	2.58		5.22		3.67	
	5.0	1.18		4.19		3.56	
	Surface to 5.0 m		95		73		62
May 77	0.3	25.62		1.96		3.81	
	1.0	10.98		3.59		1.31	
	3.0	3.18		0.26		0.58	
	5.0	2.78		0.22		0.21	
	Surface to 5.0 m		118		17		12
Aug. 77	0.3	39.85		16.72		33.15	
	1.0	18.89		5.97		13.41	
	3.0	1.81		1.45		1.48	
	5.0	0.41		0.69		0.66	
	Surface to 5.0 m		221		89		171
Nov. 77	0.3	1.75		2.36		6.01	
	1.0	0.82		1.05		2.60	
	3.0	0.18		0.23		0.46	
	5.0	0.04		0.11		0.20	
	Surface to 5.0 m		29		39		94
May 82	0.3	21.43		3.70		5.67	
	1.0	27.91		7.58		5.09	
	3.0	4.28		9.52		5.69	
	5.0	0.95		6.71		1.94	
	Surface to 5.0 m		219		239		149

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Aug. 82	0.3	7.34		5.91		10.43	
	1.0	8.68		7.70		13.58	
	3.0	2.61		2.54		5.35	
	5.0	0.20		0.76		1.16	
	Surface to 5.0 m		147		163		523
Nov. 82	0.3	3.74		2.25		4.40	
	1.0	3.42		2.84		6.60	
	3.0	0.67		1.38		4.32	
	5.0	0.23		0.84		2.08	
	Surface to 5.0 m		67		68		188
Feb. 83	0.3	1.46		0.83		1.53	
	1.0	2.27		1.89		2.47	
	3.0	1.55		1.21		2.19	
	5.0	0.60		1.31		2.09	
	Surface to 5.0 m		60		50		83
May 83	0.3	12.91		18.86		24.57	
	1.0	14.29		10.84		44.18	
	3.0	12.33		15.87		8.62	
	5.0	7.53		14.91		0.95	
	Surface to 5.0 m		451		617		736
Aug. 83	0.3	14.16		7.69		7.42	
	1.0	19.65		10.66		9.08	
	3.0	2.57		3.25		3.87	
	5.0	0.63		1.32		0.86	
	Surface to 5.0 m		374		248		241

Appendix 5-G. (Continued)

		TRM 496.5		TRM 506.5		TRM 518.0	
Date	Depth	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Nov. 83	0.3	1.49		0.13		5.03	
	1.0	1.56		0.00		3.97	
	3.0	0.28		0.00		2.47	
	5.0	0.90		2.13		0.01	
	Surface to 5.0 m		33		13		89

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb 73	0.3	19.06		15.03		11.32	
	1.0	15.86		14.85		11.78	
	3.0	2.11		1.88		1.49	
	5.0	0.58		0.65		0.70	
	Surface to 5.0 m		90		81		64
May 73	0.3	15.93		15.93		10.71	
	1.0	7.29		7.84		7.38	
	3.0	1.36		1.31		1.23	
	5.0	0.69		0.36		0.37	
	Surface to 5.0 m		117		119		101
Aug 73	0.3	59.71		64.16		50.13	
	1.0	49.08		43.82		35.64	
	3.0	10.59		8.42		6.22	
	5.0	3.71		2.58		1.74	
	Surface to 5.0 m		284		259		205
Nov 73	0.3	8.55		13.54		13.41	
	1.0	5.62		8.60		8.71	
	3.0	1.00		1.46		1.33	
	5.0	0.47		0.65		0.63	
	Surface to 5.0 m		192		293		291
Feb 74	0.3	3.65		3.56		2.61	
	1.0	0.83		0.77		0.67	
	3.0	0.11		0.17		0.11	
	5.0	0.10		0.12		0.12	
	Surface to 5.0 m		129		130		101

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
May 74	0.3	6.34		5.75		4.62	
	1.0	2.20		2.01		1.80	
	3.0	0.72		0.78		0.42	
	5.0	0.55		0.59		0.33	
	Surface to 5.0 m		12		11		9
Aug 74	0.3	14.17		17.38		9.48	
	1.0	11.04		13.65		10.35	
	3.0	4.30		5.71		3.75	
	5.0	1.58		2.25		1.60	
	Surface to 5.0 m		55		69		48
Nov 74	0.3	14.45		14.60		15.17	
	1.0	9.38		10.87		10.19	
	3.0	1.61		1.79		1.84	
	5.0	0.69		0.66		0.64	
	Surface to 5.0 m		95		104		102
May 75	0.3	15.98		15.13		6.84	
	1.0	14.56		13.26		6.10	
	3.0	5.25		5.29		2.48	
	5.0	2.04		1.77		0.66	
	Surface to 5.0 m		2		2		1
Aug. 75	0.3	15.41		16.10		12.30	
	1.0	10.24		11.89		9.11	
	3.0	3.14		3.69		3.62	
	5.0	1.32		1.40		1.31	
	Surface to 5.0 m		17		20		16

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Nov. 75	0.3	21.25		24.49		27.24	
	1.0	15.27		14.12		15.89	
	3.0	2.05		1.56		1.84	
	5.0	0.83		0.67		0.59	
	Surface to 5.0 m		180		174		196
Feb. 76	0.3	9.91		10.42		9.80	
	1.0	9.07		9.38		8.26	
	3.0	1.48		1.60		1.62	
	5.0	0.85		0.61		0.48	
	Surface to 5.0 m		59		61		55
May 76	0.3	11.62		12.19		9.77	
	1.0	9.22		9.31		7.17	
	3.0	1.53		2.11		1.17	
	5.0	0.72		0.78		0.46	
	Surface to 5.0 m		7		8		6
Aug. 76	0.3	28.36		31.55		23.30	
	1.0	26.53		21.28		18.48	
	3.0	7.16		7.23		5.30	
	5.0	2.35		2.36		1.82	
	Surface to 5.0 m		715		653		524
Nov. 76	0.3	15.18		14.11		14.55	
	1.0	12.07		11.03		13.58	
	3.0	2.89		2.91		3.13	
	5.0	0.86		0.92		0.98	
	Surface to 5.0 m		842		790		908

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 77	0.3	18.65		19.53		17.07	
	1.0	13.97		13.27		12.29	
	3.0	4.93		5.67		4.96	
	5.0	6.24		4.26		4.23	
	Surface to 5.0 m		81		79		72
May 77	0.3	32.43		31.52		28.41	
	1.0	24.24		18.04		23.85	
	3.0	6.27		6.41		4.44	
	5.0	2.44		2.59		2.09	
	Surface to 5.0 m		161		139		145
Aug. 77	0.3	77.80		43.72		39.73	
	1.0	51.74		23.79		18.81	
	3.0	7.65		3.68		2.51	
	5.0	5.00		2.54		2.10	
	Surface to 5.0 m		579		286		234
Nov. 77	0.3	7.03		9.99		10.15	
	1.0	4.99		4.53		0.00	
	3.0	0.65		0.97		0.00	
	5.0	0.23		0.37		0.00	
	Surface to 5.0 m		147		166		60
May 82	0.3	3.18		0.99		3.46	
	1.0	5.29		1.78		4.67	
	3.0	1.85		3.80		4.26	
	5.0	1.01		1.52		2.82	
	Surface to 5.0 m		111		74		136

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Aug. 82	0.3	42.84		36.44		27.44	
	1.0	43.89		40.22		24.74	
	3.0	42.20		36.67		35.15	
	5.0	30.41		33.76		32.38	
	Surface to 5.0 m		8112		5119		2030
Nov. 82	0.3	9.31		9.98		7.88	
	1.0	9.84		9.81		8.23	
	3.0	0.57		5.33		6.18	
	5.0	0.72		2.10		4.09	
	Surface to 5.0 m		248		295		381
Feb. 83	0.3	2.47		1.40		2.21	
	1.0	2.58		2.33		2.36	
	3.0	2.76		1.72		0.85	
	5.0	2.00		2.33		0.33	
	Surface to 5.0 m		139		92		59
May 83	0.3	33.33		15.23		6.65	
	1.0	29.64		12.69		7.82	
	3.0	7.46		8.08		4.92	
	5.0	1.24		4.05		2.37	
	Surface to 5.0 m		720		367		203
Aug. 83	0.3	55.85		7.89		5.34	
	1.0	46.38		8.81		5.43	
	3.0	16.23		1.63		3.65	
	5.0	2.60		0.13		1.54	
	Surface to 5.0 m		2454		295		237

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Nov. 83	0.3	6.03		11.04		8.23	
	1.0	5.03		7.39		5.81	
	3.0	2.14		0.95		1.60	
	5.0	0.63		0.33		0.64	
	Surface to 5.0 m		79		104		99

Appendix 5-G. (Continued)

Date	Depth	TRM 532.1	
		MgC/m3/hr	MgC/m2/day
Feb 73	0.3	18.51	
	1.0	16.74	
	3.0	2.31	
	5.0	0.76	
	Surface to 5.0 m		94
May 73	0.3	44.91	
	1.0	18.23	
	3.0	3.94	
	5.0	1.52	
	Surface to 5.0 m		310
Aug 73	0.3	69.24	
	1.0	57.36	
	3.0	7.43	
	5.0	1.69	
	Surface to 5.0 m		303
Nov 73	0.3	20.41	
	1.0	15.57	
	3.0	2.57	
	5.0	1.40	
	Surface to 5.0 m		506
Feb 74	0.3	4.07	
	1.0	0.83	
	3.0	0.17	
	5.0	0.11	
	Surface to 5.0 m		143

Appendix 5-G. (Continued)

May 74	0.3	10.58	
	1.0	3.57	
	3.0	0.71	
	5.0	0.54	
	Surface to 5.0 m		18
Aug 74	0.3	21.84	
	1.0	26.63	
	3.0	12.29	
	5.0	4.33	
	Surface to 5.0 m		129
Nov 74	0.3	18.64	
	1.0	13.00	
	3.0	1.99	
	5.0	0.76	
	Surface to 5.0 m		126
May 75	0.3	6.09	
	1.0	4.88	
	3.0	2.00	
	5.0	0.84	
	Surface to 5.0 m		1
Aug. 75	0.3	57.45	
	1.0	46.34	
	3.0	15.84	
	5.0	4.84	
	Surface to 5.0 m		754
Nov. 75	0.3	44.31	
	1.0	8.13	
	3.0	2.90	
	5.0	1.08	
	Surface to 5.0 m		193

Appendix 5-G. (Continued)

Feb. 76	0.3	4.32	
	1.0	5.75	
	3.0	1.17	
	5.0	0.55	
	Surface to 5.0 m		36
May 76	0.3	13.86	
	1.0	10.21	
	3.0	2.49	
	5.0	2.13	
	Surface to 5.0 m		9
Aug. 76	0.3	38.70	
	1.0	39.13	
	3.0	13.60	
	5.0	3.64	
	Surface to 5.0 m		1103
Nov. 76	0.3	14.40	
	1.0	15.93	
	3.0	3.84	
	5.0	1.21	
	Surface to 5.0 m		1041
Feb. 77	0.3	19.61	
	1.0	20.10	
	3.0	7.20	
	5.0	4.62	
	Surface to 5.0 m		103
May 77	0.3	90.83	
	1.0	79.63	
	3.0	15.61	
	5.0	5.16	
	Surface to 5.0 m		479
Aug. 77	0.3	38.79	
	1.0	23.97	
	3.0	4.50	
	5.0	0.72	
	Surface to 5.0 m		276

Appendix 5-G. (Continued)

Nov. 77	0.3	23.86	
	1.0	11.15	
	3.0	1.54	
	5.0	0.39	
	Surface to 5.0 m		377
May 82	0.3	16.76	
	1.0	19.41	
	3.0	17.30	
	5.0	12.17	
	Surface to 5.0 m		353
Aug. 82	0.3	101.7	
	1.0	84.43	
	3.0	25.16	
	5.0	6.02	
	Surface to 5.0 m		2725
Nov. 82	0.3	13.72	
	1.0	11.73	
	3.0	4.10	
	5.0	0.92	
	Surface to 5.0 m		274
Feb. 83	0.3	1.88	
	1.0	2.31	
	3.0	0.99	
	5.0	0.74	
	Surface to 5.0 m		53
May 83	0.3	4.92	
	1.0	7.34	
	3.0	4.07	
	5.0	0.87	
	Surface to 5.0 m		167
Aug. 83	0.3	3.21	
	1.0	3.26	
	3.0	1.01	
	5.0	0.21	
	Surface to 5.0 m		91

Appendix 5-G. (Continued)

Nov. 83	0.3	8.03	
	1.0	4.06	
	3.0	1.93	
	5.0	0.21	
	Surface to 5.0 m		103

Appendix 5-G. (Continued)

		TRM 496.5		TRM 506.5		TRM 518.0	
Date	Depth	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 76	0.3	9.53		12.47		11.12	
	1.0	3.09		8.95		10.44	
	3.0	0.56		1.49		1.69	
	5.0	0.45		0.67		0.62	
	Surface to 5.0 m		6		61		67
May 76	0.3	11.07		2.59		4.03	
	1.0	6.01		2.78		3.31	
	3.0	0.59		0.52		0.51	
	5.0	0.37		0.17		0.28	
	Surface to 5.0 m		51		2		3
Aug. 76	0.3	17.89		17.71		24.47	
	1.0	13.81		13.65		19.93	
	3.0	2.68		4.03		5.51	
	5.0	1.01		1.56		1.74	
	Surface to 5.0 m		35		394		556
Nov. 76	0.3	4.04		5.69		9.73	
	1.0	3.25		4.95		9.09	
	3.0	0.72		1.14		1.91	
	5.0	0.36		0.37		0.64	
Surface to 5.0 m			29		336		598

Appendix 5-G. (Continued)

		TRM 527.4		TRM 528.0		TRM 529.5	
Date	Depth	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 76	0.3	9.91		10.42		9.80	
	1.0	9.07		9.38		8.26	
	3.0	1.48		1.60		1.62	
	5.0	0.85		0.61		0.48	
	Surface to 5.0 m		59		61		55
May 76	0.3	11.62		12.19		9.77	
	1.0	9.22		9.31		7.17	
	3.0	1.53		2.11		1.17	
	5.0	0.72		0.78		0.46	
	Surface to 5.0 m		7		8		6
Aug. 76	0.3	28.36		31.55		23.30	
	1.0	26.53		21.28		18.48	
	3.0	7.16		7.23		5.30	
	5.0	2.35		2.36		1.82	
	Surface to 5.0 m		715		653		524
Nov. 76	0.3	15.18		14.11		14.55	
	1.0	12.07		11.03		13.58	
	3.0	2.89		2.91		3.13	
	5.0	0.86		0.92		0.98	
	Surface to 5.0 m		842		790		908

Appendix 5-G. (Continued)

		TRM 532.1	
Date	Depth	MgC/m3/hr	MgC/m2/day
Feb. 76	0.3	4.32	
	1.0	5.75	
	3.0	1.17	
	5.0	0.55	
	Surface to 5.0 m		36
May 76	0.3	13.86	
	1.0	10.21	
	3.0	2.49	
	5.0	2.13	
	Surface to 5.0 m		9
Aug. 76	0.3	38.70	
	1.0	39.13	
	3.0	13.60	
	5.0	3.64	
	Surface to 5.0 m		1103
Nov. 76	0.3	14.40	
	1.0	15.93	
	3.0	3.84	
	5.0	1.21	
	Surface to 5.0 m		1041

Appendix 5-G. (Continued)

		TRM 496.5		TRM 506.5		TRM 518.0	
Date	Depth	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 77	0.3	8.81		17.29		16.19	
	1.0	10.85		12.22		10.91	
	3.0	2.58		5.22		3.67	
	5.0	1.18		4.19		3.56	
	Surface to 5.0 m		95		73		62
May 77	0.3	25.62		1.96		3.81	
	1.0	10.98		3.59		1.31	
	3.0	3.18		0.26		0.58	
	5.0	2.78		0.22		0.21	
	Surface to 5.0 m		118		17		12
Aug. 77	0.3	39.85		16.72		33.15	
	1.0	18.89		5.97		13.41	
	3.0	1.81		1.45		1.48	
	5.0	0.41		0.69		0.66	
	Surface to 5.0 m		221		89		171
Nov. 77	0.3	1.75		2.36		6.01	
	1.0	0.82		1.05		2.60	
	3.0	0.18		0.23		0.46	
	5.0	0.04		0.11		0.20	
	Surface to 5.0 m		29		39		94

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 77	0.3	18.65		19.53		17.07	
	1.0	13.97		13.27		12.29	
	3.0	4.93		5.67		4.96	
	5.0	6.24		4.26		4.23	
	Surface to 5.0 m		81		79		72
May 77	0.3	32.43		31.52		28.41	
	1.0	24.24		18.04		23.85	
	3.0	6.27		6.41		4.44	
	5.0	2.44		2.59		2.09	
	Surface to 5.0 m		161		139		145
Aug. 77	0.3	77.80		43.72		39.73	
	1.0	51.74		23.79		18.81	
	3.0	7.65		3.68		2.51	
	5.0	5.00		2.54		2.10	
	Surface to 5.0 m		579		286		234
Nov. 77	0.3	7.03		9.99		10.15	
	1.0	4.99		4.53		0.00	
	3.0	0.65		0.97		0.00	
	5.0	0.23		0.37		0.00	
	Surface to 5.0 m		147		166		60

Appendix 5-G. (Continued)

Date	Depth	TRM 532.1	
		MgC/m3/hr	MgC/m2/day
Feb. 77	0.3	19.61	
	1.0	20.10	
	3.0	7.20	
	5.0	4.62	
	Surface to 5.0 m		103
May 77	0.3	90.83	
	1.0	79.63	
	3.0	15.61	
	5.0	5.16	
	Surface to 5.0 m		479
Aug. 77	0.3	38.79	
	1.0	23.97	
	3.0	4.50	
	5.0	0.72	
	Surface to 5.0 m		276
Nov. 77	0.3	23.86	
	1.0	11.15	
	3.0	1.54	
	5.0	0.39	
	Surface to 5.0 m		377

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
May 82	0.3	21.43		3.70		5.67	
	1.0	27.91		7.58		5.09	
	3.0	4.28		9.52		5.69	
	5.0	0.95		6.71		1.94	
	Surface to 5.0 m		219		239		149
Aug. 82	0.3	7.34		5.91		10.43	
	1.0	8.68		7.70		13.58	
	3.0	2.61		2.54		5.35	
	5.0	0.20		0.76		1.16	
	Surface to 5.0 m		147		163		523
Nov. 82	0.3	3.74		2.25		4.40	
	1.0	3.42		2.84		6.60	
	3.0	0.67		1.38		4.32	
	5.0	0.23		0.84		2.08	
	Surface to 5.0 m		67		68		188

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
May 82	0.3	3.18		0.99		3.46	
	1.0	5.29		1.78		4.67	
	3.0	1.85		3.80		4.26	
	5.0	1.01		1.52		2.82	
	Surface to 5.0 m		111		74		136
Aug. 82	0.3	42.84		36.44		27.44	
	1.0	43.89		40.22		24.74	
	3.0	42.20		36.67		35.15	
	5.0	30.41		33.76		32.38	
	Surface to 5.0 m		8112		5119		2030
Nov. 82	0.3	9.31		9.98		7.88	
	1.0	9.84		9.81		8.23	
	3.0	0.57		5.33		6.18	
	5.0	0.72		2.10		4.09	
	Surface to 5.0 m		248		295		381

Appendix 5-G. (Continued)

Date	Depth	TRM 532.1 MgC/m3/hr	TRM 532.1 MgC/m2/day
May 82	0.3	16.76	
	1.0	19.41	
	3.0	17.30	
	5.0	12.17	
	Surface to 5.0 m		353
Aug. 82	0.3	101.7	
	1.0	84.43	
	3.0	25.16	
	5.0	6.02	
	Surface to 5.0 m		2725
Nov. 82	0.3	13.72	
	1.0	11.73	
	3.0	4.10	
	5.0	0.92	
	Surface to 5.0 m		274

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 83	0.3	1.46		0.83		1.53	
	1.0	2.27		1.89		2.47	
	3.0	1.55		1.21		2.19	
	5.0	0.60		1.31		2.09	
	Surface to 5.0 m		60		50		83
May 83	0.3	12.91		18.86		24.57	
	1.0	14.29		10.84		44.18	
	3.0	12.33		15.87		8.62	
	5.0	7.53		14.91		0.95	
	Surface to 5.0 m		451		617		736
Aug. 83	0.3	14.16		7.69		7.42	
	1.0	19.65		10.66		9.08	
	3.0	2.57		3.25		3.87	
	5.0	0.63		1.32		0.86	
	Surface to 5.0 m		374		248		241
Nov. 83	0.3	1.49		0.13		5.03	
	1.0	1.56		0.00		3.97	
	3.0	0.28		0.00		2.47	
	5.0	0.90		2.13		0.01	
	Surface to 5.0 m		33		13		89

Appendix 5-G. (Continued)

Date	Depth	TRM 527.4		TRM 528.0		TRM 529.5	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 83	0.3	2.47		1.40		2.21	
	1.0	2.58		2.33		2.36	
	3.0	2.76		1.72		0.85	
	5.0	2.00		2.33		0.33	
	Surface to 5.0 m		139		92		59
May 83	0.3	33.33		15.23		6.65	
	1.0	29.64		12.69		7.82	
	3.0	7.46		8.08		4.92	
	5.0	1.24		4.05		2.37	
	Surface to 5.0 m		720		367		203
Aug. 83	0.3	55.85		7.89		5.34	
	1.0	46.38		8.81		5.43	
	3.0	16.23		1.63		3.65	
	5.0	2.60		0.13		1.54	
	Surface to 5.0 m		2454		295		237
Nov. 83	0.3	6.03		11.04		8.23	
	1.0	5.03		7.39		5.81	
	3.0	2.14		0.95		1.60	
	5.0	0.63		0.33		0.64	
	Surface to 5.0 m		79		104		99

Appendix 5-G. (Continued)

Date	Depth	TRM 532.1 MgC/m3/hr	TRM 532.1 MgC/m2/day
Feb. 83	0.3	1.88	
	1.0	2.31	
	3.0	0.99	
	5.0	0.74	
	Surface to 5.0 m		53
May 83	0.3	4.92	
	1.0	7.34	
	3.0	4.07	
	5.0	0.87	
	Surface to 5.0 m		167
Aug. 83	0.3	3.21	
	1.0	3.26	
	3.0	1.01	
	5.0	0.21	
	Surface to 5.0 m		91
Nov. 83	0.3	8.03	
	1.0	4.06	
	3.0	1.93	
	5.0	0.21	
	Surface to 5.0 m		103

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5		TRM 506.5		TRM 518.0		TRM 527.4	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 84	0.3	5.91		6.53		4.98		7.40	
	1.0	8.94		6.98		6.29		11.28	
	3.0	2.07		4.80		2.58		7.99	
	5.0	0.29		2.16		.		2.99	
	Surface to 5.0 m		154		186		136		304
May 84	0.3	6.23		3.18		3.90		0.35	
	1.0	6.59		3.69		7.03		1.56	
	3.0	3.57		1.85		1.60		3.52	
	5.0	1.17		0.78		0.67		1.52	
	Surface to 5.0 m		183		95		130		93
Aug. 84	0.3	3.65		8.96		15.68		10.18	
	1.0	7.80		12.65		19.96		22.66	
	3.0	4.28		5.48		4.16		9.59	
	5.0	1.20		0.94		0.79		4.06	
	Surface to 5.0 m		272		277		422		719
Nov. 84	0.3	1.52		1.49		2.36		6.37	
	1.0	1.90		2.19		2.54		8.44	
	3.0	0.36		0.73		0.58		4.72	
	5.0	0.14		0.32		0.00		2.26	
	Surface to 5.0 m		34		45		132		351

Appendix 5-G. (Continued)

		TRM 528.0		TRM 529.5		TRM 532.1	
Date	Depth	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 84	0.3	4.65		9.63		13.18	
	1.0	10.43		19.43		11.55	
	3.0	4.97		6.63		7.92	
	5.0	1.58		1.66		2.35	
	Surface to 5.0 m		221		361		433
May 84	0.3	0.97		0.92		2.88	
	1.0	0.60		2.25		5.94	
	3.0	1.69		0.69		4.21	
	5.0	0.92		0.17		1.12	
	Surface to 5.0 m		48		44		131
Aug. 84	0.3	19.63		23.66		33.20	
	1.0	18.01		20.03		44.74	
	3.0	7.57		1.47		18.55	
	5.0	3.14		0.08		3.16	
	Surface to 5.0 m		534		755		741
Nov. 84	0.3	7.42		8.45		11.74	
	1.0	8.03		7.87		11.12	
	3.0	4.57		1.76		1.97	
	5.0	0.62		1.23		0.31	
	Surface to 5.0 m		246		168		171

Appendix 5-G. (Continued)

Date	Depth	TRM 496.5 MgC/m3/hr	TRM 496.5 MgC/m2/day	TRM 506.5 MgC/m3/hr	TRM 506.5 MgC/m2/day	TRM 518.0 MgC/m3/hr	TRM 518.0 MgC/m2/day	TRM 527.4 MgC/m3/hr	TRM 527.4 MgC/m2/da
Feb. 85	0.3	3.97		4.46		1.66		2.08	
	1.0	5.25		4.39		2.95		1.56	
	3.0	1.05		1.60		1.53		0.56	
	5.0	0.34		0.36		0.00		0.94	
	Surface to 5.0 m		96		81		55		112
May 85	0.3	35.07		22.92		21.77		8.51	
	1.0	41.24		23.63		20.01		8.39	
	3.0	6.79		3.18		10.61		4.42	
	5.0	0.47		0.85		1.16		1.04	
	Surface to 5.0 m		786		374		439		221
Aug. 85	0.3	562.5		641.8		1707		1273	
	1.0	1247		709		1306		673.4	
	3.0	590.4		159.1		137.5		115.5	
	5.0	122.9		13.80		21.46		119.6	
	Surface to 5.0 m		45775		11781		19133		78674
Nov. 85	0.3	1.03		0.83		2.15		7.59	
	1.0	0.56		0.55		1.35		5.08	
	3.0	0.10		0.09		0.31		1.79	
	5.0	0.02		0.03		0.09		0.74	
	Surface to 5.0 m		14		11		33		153

Appendix 5-G. (Continued)

Date	Depth	TRM 528.0		TRM 529.5		TRM 532.1	
		MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day	MgC/m3/hr	MgC/m2/day
Feb. 85	0.3	3.72		3.54		2.54	
	1.0	2.92		2.35		2.52	
	3.0	0.00		0.28		0.28	
	5.0	0.00		0.87		0.12	
	Surface to 5.0 m		70		62		46
May 85	0.3	8.30		2.94		13.62	
	1.0	9.90		7.46		10.73	
	3.0	5.54		4.21		15.71	
	5.0	2.30		2.37		5.54	
	Surface to 5.0 m		249		163		504
Aug. 85	0.3	1302		1615		1050	
	1.0	979.4		641.1		2356	
	3.0	228.8		143		460.8	
	5.0	72.94		34.51		130.5	
	Surface to 5.0 m		52200		35627		51983
Nov. 85	0.3	5.26		8.41		12.74	
	1.0	4.36		4.57		5.47	
	3.0	1.38		0.79		0.00	
	5.0	0.73		0.04		0.00	
	Surface to 5.0 m		152		91		102

APPENDIX 5-H

PERCENTAGE COMPOSITION OF ZOOPLANKTON GROUPS
DURING PREOPERATIONAL MONITORING PERIODS,
WATTS BAR NUCLEAR PLANT

Appendix 5-H. Percentage Composition of Zooplankton Groups during Preoperational Monitoring Periods, Watts Bar Nuclear Plant

Date	Zooplankton Group	Tennessee River Mile 496.5	506.6	518.0	527.4	528.0	529.5	532.1
Feb 1973	Cladocera	0	1	1	1	2	2	3
	Copepoda	3	15	7	11	16	13	24
	Rotifera	97	84	92	88	82	85	73
May 1973	Cladocera	50	86	62	42	40	43	34
	Copepoda	5	3	3	4	5	9	10
	Rotifera	44	11	35	54	55	48	57
Aug 1973	Cladocera	48	49	13	12	14	18	18
	Copepoda	14	9	5	8	8	12	9
	Rotifera	38	42	82	80	78	70	73
Nov 1973	Cladocera	44	49	42	48	44	26	25
	Copepoda	23	17	17	24	24	40	22
	Rotifera	33	33	41	27	32	34	53
Feb 1974	Cladocera	6	8	7	7	8	5	7
	Copepoda	24	27	29	29	29	26	22
	Rotifera	70	65	64	64	63	69	71
May 1974	Cladocera	30	76	46	63	65	66	47
	Copepoda	4	11	7	6	9	12	15
	Rotifera	66	14	46	31	26	22	38
Aug 1974	Cladocera	37	55	55	40	46	33	33
	Copepoda	38	41	43	53	48	60	31
	Rotifera	24	4	3	7	6	6	36

Appendix 5-H. (Continued)

Date	Zooplankton Group	Tennessee River Mile 496.5	506.6	518.0	527.4	528.0	529.5	532.1
Nov 1974	Cladocera	29	45	25	24	24	23	24
	Copepoda	23	6	3	7	13	14	19
	Rotifera	48	49	72	70	63	63	57
Feb 1975	Cladocera	2	4	5	7	9	9	7
	Copepoda	30	25	22	33	41	35	38
	Rotifera	67	72	73	60	51	56	55
May 1975	Cladocera	77	74	75	80	35	68	67
	Copepoda	4	5	6	7	32	18	19
	Rotifera	19	22	19	13	33	14	15
Aug 1975	Cladocera	31	45	33	38	40	39	28
	Copepoda	22	19	26	22	22	37	15
	Rotifera	48	36	41	40	37	24	57
Nov 1975	Cladocera	11	19	14	14	13	12	13
	Copepoda	30	33	31	21	27	32	21
	Rotifera	59	48	55	65	60	55	65
Feb 1976	Cladocera	1	*	*	*	*	*	*
	Copepoda	12	*	*	*	*	*	*
	Rotifera	87	*	*	*	*	*	*
May 1976	Cladocera	57	79	40	49	45	46	16
	Copepoda	21	12	31	25	28	26	52
	Rotifera	22	9	28	26	27	28	33

Appendix 5-H. (Continued)

Date	Zooplankton Group	Tennessee River Mile						
		496.5	506.6	518.0	527.4	528.0	529.5	532.1
Aug 1976	Cladocera	19	19	17	11	11	27	10
	Copepoda	21	18	13	8	10	15	11
	Rotifera	60	63	70	81	79	58	79
Nov 1976	Cladocera	26	26	11	11	10	8	8
	Copepoda	11	5	5	14	16	19	22
	Rotifera	63	68	83	75	75	73	71
Feb 1977	Cladocera	1	1	1	0	1	0	1
	Copepoda	8	7	8	10	8	9	13
	Rotifera	91	93	91	89	91	90	86
May 1977	Cladocera	24	32	15	21	23	23	18
	Copepoda	4	5	5	8	6	15	16
	Rotifera	72	64	81	70	71	62	66
Aug 1977	Cladocera	11	21	21	24	23	24	8
	Copepoda	28	35	37	24	27	22	12
	Rotifera	62	43	42	52	51	53	80
Nov 1977	Cladocera	10	7	6	7	5	3	1
	Copepoda	17	7	7	16	16	11	6
	Rotifera	73	86	87	77	78	87	93
May 1982	Cladocera	41	84	50	21	29	23	36
	Copepoda	11	11	14	18	16	20	21
	Rotifera	48	5	37	61	55	57	43

Appendix 5-H. (Continued)

Date	Zooplankton Group	Tennessee River Mile 496.5	506.6	518.0	527.4	528.0	529.5	532.1
Aug 1982	Cladocera	19	32	22	10	13	12	14
	Copepoda	9	18	20	10	16	17	16
	Rotifera	73	50	58	81	70	70	70
Nov 1982	Cladocera	71	82	46	38	23	21	17
	Copepoda	15	10	18	10	7	26	22
	Rotifera	13	8	37	52	69	53	62
Feb 1983	Cladocera	7	3	1	2	2	3	4
	Copepoda	8	10	7	5	7	8	5
	Rotifera	85	87	92	93	90	89	91
Jun 1983	Cladocera	12	6	7	4	4	9	4
	Copepoda	7	3	0	2	2	4	4
	Rotifera	81	91	93	94	93	86	92
Aug 1983	Cladocera	33	54	25	20	17	25	17
	Copepoda	12	12	15	18	17	34	11
	Rotifera	55	34	60	62	66	41	72
Nov 1983	Cladocera	89	85	62	43	41	38	35
	Copepoda	4	8	4	11	9	20	20
	Rotifera	8	7	34	46	49	42	45
Feb 1984	Cladocera	4	3	3	3	2	5	3
	Copepoda	15	13	21	16	25	20	20
	Rotifera	80	84	77	81	73	75	78

Appendix 5-H. (Continued)

Date	Zooplankton Group	Tennessee River Mile 496.5	506.6	518.0	527.4	528.0	529.5	532.1
May 1984	Cladocera	20	17	6	9	5	8	4
	Copepoda	9	8	2	4	4	7	3
	Rotifera	71	75	92	87	91	84	93
Aug 1984	Cladocera	28	35	9	7	5	8	11
	Copepoda	15	10	7	8	11	18	25
	Rotifera	56	54	84	85	84	74	64
Nov 1984	Cladocera	60	82	76	63	63	62	49
	Copepoda	22	12	18	23	20	28	39
	Rotifera	18	6	5	13	17	9	11
Feb 1985	Cladocera	1	3	4	*	*	2	8
	Copepoda	35	11	9	*	*	23	21
	Rotifera	63	86	87	*	*	75	71
May 1985	Cladocera	3	4	3	2	*	2	5
	Copepoda	10	12	22	7	*	10	20
	Rotifera	87	84	75	91	*	88	75
Aug 1985	Cladocera	23	40	35	25	30	32	24
	Copepoda	16	43	38	55	51	43	46
	Rotifera	61	17	26	21	19	24	30
Nov 1985	Cladocera	21	21	7	8	13	9	10
	Copepoda	32	44	27	28	28	42	36
	Rotifera	47	35	66	64	59	49	53

*No sample taken or sample not acceptable due to malfunctioning equipment or mishandling.

APPENDIX 5-I

MEAN ZOOPLANKTON DENSITIES (NO./M^3)
AT EACH SAMPLE STATION DURING PREOPERATIONAL MONITORING,
WATTS BAR NUCLEAR PLANT

Appendix 5-I. Mean Zooplankton Densities (No./M^3) at Each Sample Station During Preoperational Monitoring, Watts Bar Nuclear Plant

	Feb 1973							May 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulus Stizostethi	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	68	0	0
Alona Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bosmina Longirostris	74	155	195	404	400	181	623	24307	41843	43893	39626	74732	58510	68285
Ceriodaphnia Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chydorus Sp.	0	0	19	0	0	0	0	0	0	0	0	0	0	0
Daphnia Ambigua	0	0	0	0	0	0	0	0	0	0	0	1	0	56
Daphnia Imm.	25	0	19	90	76	0	0	53	128	1187	1066	2663	4772	12565
Daphnia Parvula	0	0	0	0	32	21	63	2	35	155	228	179	201	425
Daphnia Pulex	0	0	0	0	0	0	0	1	0	0	52	0	0	0
Daphnia Retrocurva	0	0	0	0	0	0	0	2	35	464	192	112	594	1350
Diaphanosoma Leuchtenbergianum	0	0	0	0	0	0	0	27	31	4	10	74	8	205
Ilyocryptus Spinifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Latona Setifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptodora Kindtii	0	0	0	0	0	0	0	2	32	35	54	77	15	100
Moina Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sida Crystallina	0	0	0	0	0	0	0	1	2	53	0	0	3	7

Appendix 5-I. (Continued)

	Feb 1973							May 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Sida Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simocephalus Imm.	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Simocephalus Vetulus	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Total	99	155	233	494	508	202	686	24396	42108	45791	41228	77907	64103	82993
Copepoda														
Calanoid Imm.	0	18	33	54	32	0	91	5	34	129	153	112	523	700
Canthocamptus Staphylinoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclopoid Imm.	197	206	191	579	795	234	1077	312	155	157	787	1899	3470	7930
Cyclops Bicuspidatus Thomasi	25	69	33	100	123	67	91	49	329	155	140	494	473	385
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclops Vernalis	0	17	0	56	0	0	0	49	484	700	339	712	887	1355
Diaptomus Mississippiensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Pallidus	0	18	15	56	0	21	63	3	72	96	49	73	14	100
Diaptomus Reighardi	25	0	19	34	32	21	29	2	1	44	9	49	5	100
Diaptomus Sanguineus	0	17	15	0	0	0	35	1	1	12	5	5	13	20
Ergasilus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Agilis	0	18	0	0	0	26	0	0	0	0	0	0	0	0
Eucyclops Prionophorus	0	0	0	0	59	0	0	0	0	0	0	0	0	0
Harpacticoida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	0	0	15	0	91	26	0	1	0	5	7	44	74	65
Nauplii	1255	1794	1428	2924	3370	1338	3533	2229	385	721	2332	5836	8093	13125
Nitocra Lacustris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tropocyclops Prasinus	0	0	0	0	0	0	0	0	0	0	0	0	0	40
Total	1502	2157	1749	3803	4502	1733	4919	2651	1461	2019	3821	9224	13552	23820

Appendix 5-I. (Continued)

	Feb 1973							May 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera														
Asplanchna Sp.	49	35	52	122	91	67	35	5781	333	232	346	1405	1078	23951
Brachionus Angularis	0	0	0	0	0	0	0	264	30	182	140	156	201	100
Brachionus Bidentata	0	0	0	0	0	0	0	0	30	0	0	0	0	0
Brachionus Budapestinensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Calyciflorus	49	139	181	291	96	130	133	991	0	0	0	44	0	0
Brachionus Caudatus	0	0	0	0	0	0	0	26	0	0	0	0	0	0
Brachionus Quadridentatus	0	0	0	0	0	0	0	49	30	51	0	0	0	40
Brachionus Urceolaris	0	0	48	34	96	0	35	0	0	0	0	0	0	0
Cephalodella Sp.	49	0	0	0	0	0	0	0	0	0	0	0	0	0
Collotheca Sp.	0	155	100	0	64	0	0	241	98	182	133	741	986	545
Conochiloides Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	25
Conochilus Unicornis	0	0	0	0	0	0	0	8081	1539	8359	24996	28849	14853	19595
Euchlanis Sp.	0	0	0	0	0	0	0	0	30	0	0	0	0	0
Filinia Sp.	49	69	85	157	123	84	126	49	0	0	0	44	60	25
Hexarthra Intermedia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexarthra Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kellicottia Bostoniensis	74	122	191	212	558	104	70	26	0	0	0	88	201	25
Keratella Sp.	739	1485	2302	3134	1728	1476	2699	2924	2200	8967	7803	19092	14649	13815
Monostyla Lunaris	25	0	0	0	0	0	0	0	0	0	0	0	0	0
Monostyla Quadridentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Notholca Sp.	0	18	15	0	32	0	29	0	0	0	0	0	0	0
Platyias Patulus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Sp.	0	0	0	0	0	0	0	72	68	27	44	44	60	195
Polyarthra Sp.	1083	1650	2285	9879	7889	2847	4476	1366	901	6666	18012	50710	35668	72925
Rotaria Sp.	0	0	0	0	0	0	0	0	30	0	0	0	0	0
Synchaeta Sp.	51425	8703	16895	17863	11834	6634	7314	1537	219	927	1986	3913	3282	8305

Appendix 5-I. (Continued)

	Feb 1973							May 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Testudinella Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichocerca Sp.	0	0	0	34	0	0	0	98	30	281	44	204	191	100
Trichotria Pocillum	0	0	0	22	0	0	0	0	0	0	0	0	0	0
Total	53542	12376	22154	31748	22511	11342	14917	21505	5538	25874	53504	105290	71229	139646

Appendix 5-I. (Continued)

	Aug 1973							Nov 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulus Stizostethi	0	2	0	0	0	0	1	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	1	0	0	0	0	0	0	0
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alona Sp.	0	0	0	0	0	0	0	1	0	0	0	0	16	0
Bosmina Longirostris	6614	13335	6599	6502	11215	21020	25278	826	926	1127	2827	4575	4146	7647
Ceriodaphnia Imm.	129	59	20	178	179	468	100	0	0	7	5	0	0	0
Ceriodaphnia Lacustris	33	91	19	23	187	179	8	0	0	0	0	0	0	0
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	1	7	10	9	48	40
Chydorus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Ambigua	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Imm.	907	837	782	1134	2922	4506	3713	6	17	14	207	451	332	744
Daphnia Parvula	33	91	39	38	153	181	3	1	2	1	50	48	32	40
Daphnia Pulex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Retrocurva	162	305	174	275	1104	1671	1792	11	2	20	83	110	111	121
Diaphanosoma Leuchtenbergianum	358	416	1061	2185	4472	10858	18937	0	6	1	10	10	32	121
Ilyocryptus Spinifer	0	1	1	1	0	0	106	1	0	0	0	0	0	22
Latona Setifera	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Leptodora Kindtii	32	65	0	30	61	91	270	2	2	1	5	20	32	40
Moina Imm.	0	52	230	0	646	1424	1651	0	0	0	0	0	0	0
Moina Micrura	17	0	0	84	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Sida Crystallina	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Sida Imm.	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Simocephalus Vetulus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	8285	15256	8925	10450	20939	40398	51859	848	956	1178	3197	5224	4749	8797

Appendix 5-I. (Continued)

	Aug 1973							Nov 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoid Imm.	97	4	59	161	222	224	383	1	2	3	67	87	78	210
Canthocamptus Staphylinoides	0	0	0	0	0	0	0	0	0	0	5	0	1	0
Cyclopoid Imm.	856	723	1005	1697	3418	5836	7679	114	87	155	590	1022	2770	3794
Cyclops Bicuspidatus Thomasi	0	0	0	0	0	0	0	0	1	7	29	92	221	40
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	2	0	7	0	0	0	0
Cyclops Vernalis	130	202	213	122	349	413	161	12	24	48	125	150	335	192
Diaptomus Mississippiensis	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Diaptomus Pallidus	97	59	21	4	41	45	17	11	1	3	68	65	47	22
Diaptomus Reighardi	0	0	1	9	0	0	0	0	0	1	0	2	2	1
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	0	0	3	22	26	1	57	6	0	0	5	1	0	1
Eucyclops Agilis	0	0	0	0	0	0	0	0	0	7	0	0	0	0
Eucyclops Prionophorus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoids	0	26	0	22	34	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	113	157	155	176	433	734	858	11	12	17	115	147	110	63
Nauplii	1067	1603	1935	5123	7713	21103	18202	287	212	233	608	1290	3873	3697
Nitocra Lacustris	16	0	0	0	0	0	0	0	0	0	0	0	0	0
Tropocyclops Prasinus	0	2	0	0	0	0	57	1	0	1	0	0	0	0
Total	2376	2776	3392	7336	12236	28356	27414	445	339	482	1612	2856	7437	8021
Rotifera														
Asplanchna Sp.	336	1169	11726	12383	19526	30538	56865	38	6	15	19	57	126	1045
Brachionus Angularis	2957	5923	24014	32430	56908	24595	38370	6	12	7	0	0	0	0
Brachionus Bidentata	17	30	0	0	0	0	0	6	0	0	0	0	0	0
Brachionus Budapestinensis	956	656	2290	4021	5383	16030	9705	0	0	0	5	12	0	18
Brachionus Calyciflorus	0	0	57	30	111	413	156	0	0	0	0	9	0	0

Appendix S-I. (Continued)

	Aug 1973							Nov 1973						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Caudatus	16	59	0	8	34	0	57	0	6	0	0	0	0	0
Brachionus Quadridentatus	0	52	0	22	0	0	50	0	0	0	0	0	0	0
Brachionus Urceolaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalodella Sp.	17	0	38	25	0	0	0	6	0	0	0	0	0	0
Collotheca Sp.	0	155	653	242	289	2162	1056	28	29	7	47	203	255	261
Conochiloides Sp.	829	2074	5275	5200	9823	13049	19101	146	0	0	0	37	0	79
Conochilus Unicornis	812	1066	2387	2113	3846	12157	19923	38	6	14	5	9	32	121
Euchlanis Sp.	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Filinia SP.	0	0	0	43	34	0	0	0	0	0	0	0	0	0
Hexarthra Intermedia	0	0	0	0	0	0	0	0	0	0	0	0	0	45
Hexarthra Sp.	0	33	0	0	0	0	453	0	0	0	0	0	0	0
Kellicottia Bostoniensis	0	0	19	17	60	234	57	6	6	7	33	44	79	95
Keratella Sp.	164	357	560	1914	3113	6490	8756	168	409	634	1437	2637	4356	7783
Monostyla Lunaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monostyla Quadridentata	0	0	0	8	0	0	0	0	0	0	0	0	0	0
Notholca Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Platyias Patulus	0	0	0	0	0	56	100	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	0	0	0	0	0	0	134
Ploesoma Sp.	274	1116	7576	9250	15950	43430	41335	6	0	22	14	77	78	181
Polyarthra Sp.	32	305	992	877	2264	6130	4974	22	47	155	108	373	590	3144
Rotaria Sp.	0	0	0	0	0	0	0	22	0	0	0	0	0	0
Synchaeta Sp.	49	124	1093	303	1340	2076	9283	141	122	276	145	350	748	6127
Testudinella Sp.	0	33	0	0	0	0	0	0	0	0	0	0	0	0
Trichocerca Sp.	17	162	196	169	365	1571	978	0	6	0	0	0	16	22
Trichotria Pocillum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6476	13316	56876	69055	119046	158931	211219	633	649	1137	1813	3808	6280	19055

Appendix 5-I. (Continued)

	Feb 1974							May 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulus Stizostethi	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladocera														
Alona Quadrangularis	0	0	0	0	4	1	0	0	0	0	0	0	0	0
Alonella Sp.	0	0	3	3	0	0	0	0	0	0	0	0	0	0
Bosmina Longirostris	267	342	202	345	313	156	190	13303	16927	3864	26071	55848	37208	54666
Bosmina Sp.	0	0	0	0	0	0	104	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ceriodaphnia Reticulata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chydorus Sp.	0	1	3	0	6	0	0	13	0	0	0	0	0	0
Daphnia Ambigua	0	28	0	0	0	0	0	0	0	0	101	0	0	0
Daphnia Galeata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Parvula	10	13	6	11	9	5	8	2	8	3	103	440	77	1417
Daphnia Pulex	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Daphnia Retrocurva	0	0	0	0	1	0	0	0	3	1	72	33	41	377
Daphnia Sp.	12	22	19	43	35	28	40	107	33	0	32	47	41	87
Diaphanosoma Leuchtenbergianum	0	0	0	4	0	0	2	60	1	1	8	11	4	496
Diaphanosoma Sp.	0	0	0	0	0	0	0	59	0	0	0	0	0	0
Leptodora Kindtii	0	0	0	0	0	0	0	15	8	6	332	1206	106	342
Leydigia Quadrangularis	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sida Crystallina	0	0	0	0	0	0	0	2	0	0	0	1	0	0
Simocephalus Imm.	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	290	406	233	406	368	190	344	13566	16980	3875	26719	57586	37477	57385

Appendix 5-I. (Continued)

	Feb 1974							May 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoida Imm.	60	46	44	40	18	14	43	29	412	3	46	493	214	294
Canthocamptus Robertcokeri	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Canthocamptus Staphylinoides	0	0	0	11	1	1	1	0	0	0	0	0	0	0
Cyclopoida Imm.	188	221	190	285	185	125	167	321	58	33	260	809	649	4461
Cyclops Bicuspidatus Thomasi	57	32	54	64	29	6	10	60	816	112	270	852	378	514
Cyclops Varicans Rubellus	0	4	0	0	1	2	0	1	0	0	0	0	0	0
Cyclops Vernalis	0	0	0	0	0	0	0	24	14	10	66	214	106	113
Diaptomus Pallidus	6	6	6	7	12	4	15	24	8	4	6	21	1	50
Diaptomus Reighardi	0	0	0	0	0	0	0	0	7	1	36	210	53	575
Diaptomus Sanguineus	0	1	0	0	1	0	1	5	0	3	5	113	38	34
Ergasilus Sp.	0	0	0	0	0	0	0	0	0	0	0	132	0	0
Eucyclops Agilis	0	1	0	0	4	0	1	1	0	0	0	0	0	0
Eucyclops Prionophorus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoida	1	1	3	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	1	1	3	0	3	0	2	1	27	3	3	13	73	88
Nauplii	894	1014	666	1359	1016	849	921	1237	1086	442	1903	5564	5042	11679
Nitocra Lacustris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paracyclops Fimbriatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paracyclops Fimbriatus Poppei	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Tropocyclops Prasinus	2	2	2	5	3	2	3	1	0	0	0	0	0	0
Total	1209	1329	971	1771	1273	1003	1164	1705	2428	611	2595	8421	6554	17808
Rotifera														
Asplanchna Sp.	26	73	70	190	81	80	104	5804	26	0	135	341	271	1368
Brachionus Angularis	11	0	0	0	0	0	0	132	0	16	74	0	18	0

Appendix 5-I. (Continued)

	Feb 1974							May 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Bidentata	0	0	0	0	0	0	0	178	16	0	0	0	0	0
Brachionus Budapestinensis	0	0	0	0	0	0	0	12	0	0	0	0	18	0
Brachionus Calyciflorus	6	7	5	0	4	4	11	2037	0	0	0	17	0	0
Brachionus Caudatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Havanaensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Quadridentatus	0	0	0	0	0	0	0	1022	0	0	0	0	0	0
Cephalodella Sp.	9	3	5	7	3	5	2	24	26	0	11	0	0	0
Collotheca Pelagica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collotheca Sp.	265	175	144	278	181	170	227	72	16	0	32	0	41	182
Conochiloides Sp.	9	0	25	49	18	12	33	83	0	0	0	0	0	0
Conochilus Hippocrepis	0	0	0	0	0	0	0	36	0	0	0	0	0	0
Conochilus Unicornis	17	3	0	4	4	5	11	16355	384	421	7081	8999	3834	22965
Epiphanes Macrourus	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Euchlanis Sp.	0	6	0	0	0	0	4	24	0	0	0	0	0	0
Filinia Sp.	29	9	3	14	6	8	2	0	0	127	0	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexarthra Sp.	0	0	0	0	0	0	0	12	0	0	0	0	0	0
Kellicottia Bostoniensis	14	28	14	34	9	12	26	0	0	0	166	62	71	17
Kellicottia Longispina	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Keratella Sp.	899	1109	558	1102	1066	885	1054	1309	2158	2827	3752	9986	5929	12888
Lecane Luna	0	0	0	0	0	0	0	12	0	0	0	0	0	0
Lecane Sp.	0	0	0	0	0	0	0	12	0	0	0	0	0	0
Monostyla Sp.	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Sp.	0	0	0	0	4	0	0	1096	206	142	396	876	0	1898
Ploesoma Truncata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polyarthra Sp.	309	260	104	401	164	152	118	345	84	299	1434	2585	2122	6688
Rotaria Neptunia	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Feb 1974							May 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotaria Sp.	14	3	6	4	0	5	6	0	0	0	0	0	0	0
Synchaeta Sp.	1940	1475	1188	1862	1235	1260	2135	618	158	49	205	325	206	374
Trichocerca Sp.	0	0	0	0	0	0	2	154	0	0	0	23	0	38
Trichotria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3548	3151	2122	3945	2775	2598	3739	29337	3074	3881	13286	23214	12510	46435

Appendix 5-I. (Continued)

	Aug 1974							Nov 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulua Stizostethi	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alonella Ap.	0	0	0	0	0	0	255	0	0	0	0	0	0	0
Bosmina Longirostris	2972	2222	6339	2438	2001	1901	278	2799	3496	3077	6237	8062	14765	21216
Bosmina Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	72	19	0	20	0	0	0	0	1	37	54
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Reticulata	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Chydorus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Ambigua	0	0	145	118	0	0	0	0	0	0	0	0	0	0
Daphnia Galeata	3	3	124	101	545	6	454	0	0	0	0	0	0	0
Daphnia Parvula	23	4	130	196	241	94	380	58	0	1	81	40	925	1543
Daphnia Pulex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Retrocurva	466	1400	2099	3478	8652	3829	8157	6	2	2	121	125	485	569
Daphnia Sp.	0	188	0	0	495	130	512	6	0	0	0	0	0	0
Diaphanosoma Leuchtenbergianum	0	119	722	2064	2269	2731	8890	7	0	0	2	38	3	162
Diaphanosoma Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptodora Kindtii	17	154	169	98	304	206	356	1	2	3	10	75	25	32
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Micrura	0	0	0	20	0	1	20	0	0	0	0	0	0	0
Sida Crystallina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	27
Total	3481	4090	9728	8585	14526	8898	19322	2877	3500	3083	6451	8341	16241	23603

Appendix 5-I. (Continued)

	Aug 1974							Nov 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoida Imm.	185	0	678	1353	1411	1214	592	20	0	16	79	198	420	541
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	0	0	3	2	0
Canthocamptus Staphylinoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclopoida Imm.	152	137	366	340	545	543	1001	428	17	0	145	99	1334	3957
Cyclops Bicuspidatus Thomasi	0	0	0	0	0	0	0	0	0	0	1	54	270	54
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclops Vernalis	152	273	1123	412	1340	563	337	40	168	82	317	480	770	1329
Diaptomus Pallidus	274	683	1035	843	2523	1579	298	32	16	2	94	324	260	216
Diaptomus Reighardi	232	291	130	39	423	281	0	7	0	0	1	38	41	54
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Eucyclops Agilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Prionophorus	0	0	0	0	0	0	0	0	0	0	14	1	1	0
Harpacticoida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	173	718	1123	752	1329	1671	829	48	18	6	132	209	226	189
Nauplii	2388	905	3114	7520	7387	10191	15158	1649	232	289	1095	3100	6882	12382
Nitocra Lacustris	0	0	0	20	0	0	0	0	0	0	0	0	0	0
Paracyclops Fimbriatus	0	0	24	0	0	0	0	0	0	0	0	0	0	0
Paracyclops Fimbriatus Poppei	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tropocyclops Prasinus	1	2	4	0	0	4	2	0	0	0	0	0	0	0
Total	3557	3009	7597	11279	14958	16046	18217	2224	451	395	1878	4506	10207	18722
Rotifera														
Asplanchna Sp.	399	0	24	157	202	76	1433	585	34	147	290	423	827	2818
Brachionus Angularis	185	0	0	0	22	0	334	55	34	26	0	73	39	81

Appendix 5-I. (Continued)

	Aug 1974							Nov 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Bidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Budapestinensis	496	0	0	0	0	0	79	0	33	38	40	89	151	0
Brachionus Calyciflorus	65	0	0	0	0	0	0	33	0	13	105	0	114	271
Brachionus Caudatus	43	0	24	0	0	0	0	0	0	0	0	0	0	0
Brachionus Havanaensis	0	34	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Quadridentatus	11	0	0	0	0	0	0	0	17	0	0	0	0	27
Cephalodella Sp.	0	0	0	0	0	0	0	0	0	13	0	0	0	0
Collotheca Pelagica	0	0	0	0	0	0	0	343	16	77	264	376	811	808
Collotheca Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	763
Conochiloides Sp.	99	0	0	0	0	0	0	0	17	0	27	78	0	0
Conochilus Hippocrepis	0	0	0	0	0	0	0	0	0	0	330	292	0	0
Conochilus Unicornis	295	0	0	0	0	0	355	329	16	79	0	0	1155	1139
Epiphanes Macrourus	0	0	0	0	0	0	0	0	0	0	53	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0	7	16	0	0	0	0	0
Filinia Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexarthra Mira	66	0	0	0	0	0	1731	0	0	0	13	0	0	0
Hexarthra Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kellicottia Bostoniensis	0	0	0	0	0	0	0	0	0	0	27	37	112	135
Kellicottia Longispina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keratella Sp.	231	257	220	503	360	281	2736	2761	3061	6876	15836	20180	32776	38672
Lecane Luna	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lecane Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monostyla Sp.	0	0	0	0	22	0	0	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	60	0	200	16	145	188	110	0
Ploesoma Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Truncata	0	0	41	0	44	95	98	118	0	102	0	0	350	135
Polyarthra Sp.	217	17	81	862	1062	939	12274	286	330	1340	1780	371	7651	9295
Rotaria Neptunia	0	0	0	0	0	0	0	7	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1974							Nov 1974						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotaria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchaeta Sp.	154	0	17	0	88	57	1629	167	66	72	79	162	621	2197
Trichocerca Sp.	22	0	50	79	44	0	255	7	0	0	0	0	39	27
Trichotria Sp.	0	0	0	0	115	207	0	6	0	0	0	0	0	0
Total	2283	308	457	1601	1959	1655	20984	4704	3840	8799	18989	22269	44756	56368

Appendix 5-I. (Continued)

	Feb 1975							May 1975						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Quadrangularis	54	0	0	41	0	17	0	0	0	0	0	0	0	0
Alona Rectangula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bosmina Longirostris	478	551	589	1536	970	1202	999	61530	30971	50165	86065	10702	55574	69871
Ceriodaphnia Imm.	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chydorus Sp.	0	0	0	0	0	0	12	0	0	0	0	0	0	0
Daphnia Imm.	0	0	0	0	0	0	0	0	273	1484	3424	3013	2584	16529
Daphnia Parvula	4	1	3	9	2	35	37	0	38	264	951	211	407	1547
Daphnia Pulex	0	0	0	0	0	0	0	0	0	0	1	2	0	0
Daphnia Retrocurva	1	1	1	0	0	0	0	435	7	24	451	213	65	1194
Diaphanosoma Leuchtenbergianum	0	0	0	0	0	4	0	129	31	56	567	262	185	2614
Ilyocryptus Spinifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptodora Kindtii	0	0	0	0	0	0	0	17	50	35	229	325	103	301
Moina Micrura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Minuta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0	0	0	2	0	1	0	3
Sida Crystallina	0	0	0	0	1	0	2	46	1	0	1	1	0	2
Simocephalus Imm.	0	0	0	0	0	0	0	0	1	0	0	0	0	
Simocephalus Serrulatus	0	0	0	0	0	0	0	88	2	0	0	0	0	1
Total	537	553	593	1586	973	1258	1050	62245	31375	52030	91689	14730	58918	92062
Copepoda														
Calanoid Imm.	38	44	13	148	104	61	135	52	23	36	195	265	261	1252
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Feb 1975							May 1975						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cyclopoid Imm.	165	201	81	511	286	349	466	213	507	704	1893	3630	2627	7400
Cydlops Bicuspidatus Thomasi	134	125	34	254	189	110	148	129	284	780	1280	1586	2770	2209
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclops Vernalis	80	106	24	94	89	2	30	132	204	461	179	314	525	837
Diaptomus Mississippiensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Pallidus	2	2	1	7	22	16	6	7	18	33	42	35	19	142
Diaptomus Reighardi	0	2	0	8	6	1	6	4	4	12	23	31	12	20
Diaptomus Sanguineus	0	0	0	0	0	15	1	6	10	18	9	59	10	27
Ergasilus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	0	0	0	0	0	0	0	1	1	0	0	0	1	0
Eucyclops Agilis	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Harpacticoid Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	55	3	2	42	0	1	1	7	23	61	382	159	76	107
Nauplii	6890	3280	2433	6396	3830	4163	5242	2844	939	1742	4363	7169	8873	13813
Tropocyclops Prasinus	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Total	7364	3763	2588	7460	4526	4718	6035	3395	2014	3847	8366	13248	15175	25808
Rotifera														
Asplanchna Sp.	1085	682	624	971	324	482	385	1172	31	43	118	159	28	296
Brachionus Angularis	158	30	0	0	0	0	23	1216	545	1244	1678	1418	774	3153
Brachionus Bidentata	0	0	0	0	0	0	0	43	0	0	0	0	0	61
Brachionus Budapestinensis	26	95	33	0	0	15	12	263	0	0	85	0	0	0
Brachionus Calyciflorus	54	0	0	0	0	15	36	219	438	338	0	0	0	0
Brachionus Caudatus	26	0	0	0	0	0	0	0	0	56	0	0	49	0
Brachionus Havanaensis	0	0	0	0	0	0	0	0	0	22	0	0	0	0

Appendix 5-I. (Continued)

	Feb 1975							May 1975						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Quadridentatus	0	0	0	0	0	0	0	85	31	0	0	0	0	0
Brachionus Urceolaris	54	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalodella Sp.	0	0	0	0	0	0	0	0	0	34	0	0	0	0
Collotheca Pelagica	695	386	133	620	440	554	570	173	0	0	0	0	0	0
Collotheca Sp.	0	0	0	0	0	0	0	0	31	22	0	0	49	0
Conochiloides Sp.	0	0	0	0	0	0	0	131	649	1145	559	684	152	358
Conochilus Unicornis	185	212	138	176	0	95	12	3399	870	2503	975	676	959	237
Contracted Rotifera	0	0	0	0	0	0	0	0	0	0	69	0	0	0
Euchlanis Sp.	78	36	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Limnetica	0	0	0	0	0	0	0	0	50	0	0	0	0	0
Filinia Longiseta	0	0	0	0	0	0	0	0	0	0	0	0	55	0
Filinia Maior	0	36	99	41	0	32	0	305	0	0	0	0	0	0
Gastropus Sp.	0	0	0	0	0	0	0	0	0	0	34	0	0	61
Hexarthra Mira	0	36	0	0	0	0	18	0	0	22	42	0	0	0
Hexarthra Mollis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kellicottia Bostoniensis	295	66	66	122	0	81	112	44	0	111	76	104	49	0
Kellicottia Longispina	0	0	0	0	0	0	0	0	62	0	0	0	0	0
Keratella Sp.	4210	2636	1775	4865	1874	1466	3870	2802	4460	5772	8180	7358	8606	11615
Machrochaetus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monostyla Sp.	0	0	0	0	19	0	0	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	0	0	0	34	0	0	0
Ploesoma Truncata	132	106	0	54	19	0	0	2342	1725	934	1222	2168	810	831
Polyarthra Sp.	0	71	99	82	57	51	18	916	50	111	432	312	228	1183
Rotaria Neptunia	108	0	57	0	16	0	0	0	0	0	0	0	0	0
Rotaria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchaeta Sp.	9225	6570	5772	6403	2880	4802	3703	2119	173	461	119	157	173	294
Trichocerca Sp.	0	0	0	0	0	17	0	173	173	320	927	904	358	2383
Total	16331	10962	8796	13334	5629	7610	8759	15402	9288	13138	14550	13940	12290	20472

Appendix 5-I. (Continued)

	Aug 1975							Nov 1975						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alona Rectangula	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Bosmina Longirostris	3222	6600	2940	4860	2125	1387	3312	1192	1026	1323	5364	7182	7241	10899
Ceriodaphnia Imm.	15	0	0	0	0	0	0	0	8	1	23	3	4	1
Ceriodaphnia Lacustris	0	66	1	121	118	8	163	1	0	0	0	1	48	71
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Chydorus Sp.	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Daphnia Imm.	797	346	590	2942	3035	1519	2809	67	37	72	935	883	2539	3397
Daphnia Parvula	15	0	178	1470	1841	2349	3518	4	8	17	215	176	153	495
Daphnia Pulex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Retrocurva	211	552	1048	8596	5645	6320	8823	28	2	61	383	303	1012	708
Diaphanosoma Leuchtenbergianum	73	928	738	12117	8391	9961	27451	44	0	1	55	232	82	0
Ilyocryptus Spinifer	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Leptodora Kindtii	44	61	117	354	416	183	186	1	3	3	35	35	38	142
Moina Micrura	14	0	0	2	4	47	581	0	0	0	0	0	0	0
Moina Minuta	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Sida Crystallina	1	38	2	0	1	0	0	2	0	0	1	0	0	0
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simocephalus Serrulatus	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Total	5107	8591	5614	30462	21578	21777	46843	1340	1084	1478	7012	8815	11117	15715
Copepoda														
Calanoid Imm.	51	47	87	410	186	416	265	78	30	19	306	343	646	354
Canthocamptus Robertcokeri	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1975							Nov 1975						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cyclopoid Imm.	660	741	671	2884	3458	3749	5778	778	1110	1315	2746	5420	10301	5804
Cyclops Bicuspidatus Thomasi	0	0	0	0	0	0	0	0	0	12	32	8	4	2
Cyclops Varicans Rubellus	1	0	0	0	0	0	0	0	0	0	0	0	0	71
Cyclops Vernalis	114	544	699	1408	1968	1564	927	60	224	629	438	855	1089	212
Diaptomus Mississippiensis	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Diaptomus Pallidus	58	24	117	73	88	61	105	26	7	32	25	92	58	19
Diaptomus Reighardi	16	8	1	63	18	18	26	29	2	11	6	19	13	5
Diaptomus Sanguineus	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Ergasilus Sp.	0	0	0	2	1	1	2	0	2	0	4	3	5	3
Eucyclops Agilis	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Harpacticoid Imm.	0	1	0	1	2	2	0	0	7	0	0	0	0	0
Harpacticoida	0	0	0	0	0	0	0	28	0	0	0	0	0	0
Mesocyclops Edax	213	702	394	531	1738	1064	1829	21	98	145	461	355	830	920
Nauplii	2514	1530	2491	12674	4530	13757	17062	2754	453	1181	6809	11308	16414	17552
Tropocyclops Prasinus	0	38	0	0	0	0	0	46	22	3	35	117	195	71
Total	3627	3635	4461	18046	11990	20632	25994	3821	1959	3347	10862	18521	29556	25014
Rotifera														
Aaplanchna Sp.	199	0	0	1	0	0	160	287	1	0	174	195	283	1209
Brachionus Angularis	629	245	132	471	626	231	1535	67	0	0	0	0	0	0
Brachionus Bidentata	14	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Budapestinensis	2164	515	270	1649	882	462	1671	584	0	0	32	0	0	0
Brachionus Calyciflorus	0	0	0	0	0	0	0	92	0	0	0	0	0	0
Brachionus Caudatus	454	0	18	0	0	0	0	0	0	0	0	0	0	0
Brachionus Havanaensis	15	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1975							Nov 1975						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Quadridentatus	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Brachionus Urceolarsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalodella Sp.	42	0	18	58	0	46	0	3	21	11	23	0	0	0
Collotheca Pelagica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collotheca Sp.	42	141	213	587	548	368	1033	658	108	269	1077	1713	3068	1203
Conochiloides Sp.	766	132	0	60	128	92	1164	0	0	0	0	0	0	71
Conochilus Unicornis	196	66	157	232	128	47	2520	942	0	10	297	120	217	1416
Contracted Rotifera	0	38	213	119	0	0	0	0	0	0	32	37	0	0
Euchlanis Sp.	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Limnetica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	29	28	46	118	58	0	1115	17	0	0	0	0	0	0
Filinia Maior	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gastropus Sp.	99	0	46	293	289	139	1508	0	8	0	0	40	0	71
Hexarthra Mira	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexarthra Mollis	15	0	0	0	0	0	0	14	0	0	0	0	0	0
Kellicottia Bostoniensis	15	28	57	177	256	278	186	31	8	33	64	40	54	212
Kellicottia Longispina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keratella Sp.	1356	4213	5112	18962	14683	10565	63933	1068	1933	4384	17556	23502	33416	51029
Machrochaetus Sp.	0	0	0	0	0	0	0	14	0	0	0	0	0	0
Monostyla Sp.	0	0	0	0	0	0	0	28	8	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	56	24	42	101	125	412	71
Ploesoma Truncata	598	187	64	1114	705	323	1404	364	290	394	3768	4704	5138	6511
Polyarthra Sp.	431	384	447	5910	70	140	12033	206	77	126	1163	3104	1719	1577
Rotaria Neptunia	14	0	0	0	0	0	0	0	0	0	0	0	0	0
Rotaria Sp.	0	0	0	0	0	0	0	109	0	0	0	0	0	0
Synchaeta Sp.	262	498	0	238	0	0	1695	2927	299	690	8352	7526	5463	13730
Trichocerca Sp.	594	505	188	1879	1659	738	6197	28	37	0	160	655	778	212
Total	7949	6980	6981	31868	20032	13429	96154	7496	2814	5959	32799	41761	50548	77312

Appendix 5-I. (Continued)

	Feb 1976							May 1976						
	Tennessee River Mile													
	496.5	506.6*	518.0*	527.4*	528.0*	529.5*	532.1*	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Quadrangularis	5							0	0	0	0	0	1	0
Bosmina Longirostris	836							34579	49168	24273	56922	52488	75945	22473
Camptocercus Rectirostris	0							0	0	0	0	0	0	0
Ceriodaphnia Imm.	0							1	0	0	0	0	0	0
Ceriodaphnia Lacustris	0							0	0	0	0	0	0	1
Ceriodaphnia Quadrangula	0							0	0	0	0	0	0	0
Ceriodaphnia Reticulata	0							0	0	0	0	0	0	0
Chydorus Sp.	3							1	0	0	0	0	0	87
Daphnia Ambigua	0							1	0	0	0	1	61	1
Daphnia Imm.	0							1442	2947	2945	5848	2965	4188	7092
Daphnia Parvula	0							158	151	198	258	397	213	393
Daphnia Pulex	0							36	0	0	0	0	0	2
Daphnia Retrocurva	5							1406	417	136	397	569	274	639
Diaphanosoma Leuchtenbergianum	0							82	66	285	343	285	497	1119
Ilyocryptus Imm.	0							0	0	0	0	0	0	0
Ilyocryptus Spinifer	0							0	0	0	0	0	0	0
Leptodora Kindtii	0							74	101	470	176	114	375	320
Leydigia Acanthocercoides	0							0	0	0	0	0	0	0
Leydigia Quadrangularis	0							0	0	0	0	0	0	0
Moina Micrura	0							0	0	0	0	0	0	0
Pleuroxus Denticulatus	0							0	0	0	0	0	0	0
Pleuroxus Hamulatus	0							0	0	0	0	0	0	1
Scapholebris Kingi	0							0	0	0	0	0	0	0
Sida Crystallina	0							0	0	0	0	0	0	1
Simocephalus Imm.	0							0	0	0	0	0	0	0
Simocephalus Serrulatus	0							0	0	0	0	0	0	1
Total	849							37780	52850	28307	63944	56819	81554	32130

Appendix 5-I. (Continued)

	Feb 1976							May 1976						
	Tennessee River Mile													
	496.5	506.6*	518.0*	527.4*	528.0*	529.5*	532.1*	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoid Imm.	107							56	465	842	921	399	853	3485
Canthocamptus Robertcokeri	0							0	0	0	0	0	1	1
Cyclopoid Imm.	1600							1440	1996	4697	4200	4323	7393	17554
Cyclops Bicuspidatus Thomasi	64							256	694	2832	1927	1491	1096	1119
Cyclops Varicans Rubellus	0							1	0	0	0	0	0	0
Cyclops Vernalis	0							74	50	532	313	283	386	712
Diaptomus Mississippiensis	0							0	0	0	0	0	0	0
Diaptomus Pallidus	0							74	115	165	74	138	23	99
Diaptomus Reighardi	6							185	117	27	28	114	20	100
Diaptomus Sanguineus	1							6	66	12	3	4	5	8
Ergasilus Sp.	0							0	0	0	0	0	0	1
Eucyclops Agilis	3							0	0	0	0	0	2	2
Eucyclops Prionophorus	4							0	0	0	0	0	0	0
Harpacticoid Imm.	0							0	16	0	0	56	0	0
Harpacticoida	1							0	0	0	0	0	0	0
Macrocyclops Albidus	0							0	0	0	0	0	15	0
Mesocyclops Edax	0							27	364	93	67	114	51	247
Nauplii	13586							11790	4317	12571	25166	27906	36848	80516
Nitocra Lacustris	0							0	0	0	0	0	0	0
Tropocyclops Prasinus	6							1	1	0	0	1	0	0
Total	15378							13910	8201	21771	32699	34829	46693	103844
Rotifera														
Asplanchna Sp.	35							879	66	0	296	229	609	306
Brachionus Angularis	0							292	83	0	55	0	0	0
Brachionus Bidentata	0							36	16	0	0	0	0	0
Brachionus Budapestinensis	0							0	0	0	0	0	61	0

Appendix 5-I. (Continued)

	Feb 1976							May 1976						
	Tennessee River Mile													
	496.5	506.6*	518.0*	527.4*	528.0*	529.5*	532.1*	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Calyciflorus	939							76	0	62	0	0	0	0
Brachionus Caudatus	0							0	0	0	0	0	0	0
Brachionus Quadridentatus	0							74	32	0	0	0	0	0
Cephalodella Sp.	0							38	0	0	0	0	0	0
Collotheca Sp.	3008							74	0	75	93	0	0	73
Conochiloides Sp.	0							36	32	136	47	116	223	348
Conochilus Hippocrepis	0							0	0	0	0	0	0	0
Conochilus Unicornis	0							2827	32	2180	5380	4272	7727	17249
Contracted Rotifera	0							0	16	0	0	0	0	0
Euchlanis Sp.	0							0	0	0	55	0	0	0
Filinia Limnetica	0							0	0	0	0	56	0	0
Filinia Longiseta	88							551	32	0	55	0	0	146
Gastropus Sp.	0							0	0	0	0	0	0	0
Hexarthra Intermedia	0							0	0	0	0	0	0	0
Hexarthra Mira	0							0	0	0	0	0	0	0
Hexarthra Sp.	0							0	16	0	0	0	0	0
Kellicottia Bostoniensis	294							179	85	136	93	287	152	0
Kellicottia Longispina	0							0	0	0	0	0	0	0
Keratella Sp.	53155							6640	5137	15727	23032	22266	22614	37926
Lecane Sp.	88							0	0	75	110	58	0	0
Monostyla Sp.	88							0	0	0	0	0	0	0
Ploesoma Hudsoni	0							1	0	0	0	0	0	0
Ploesoma Truncata	0							187	115	508	304	517	284	1613
Polyarthra Sp.	4372							1951	66	508	4086	5250	15809	6608
Rotaria Sp.	0							0	0	298	0	0	0	0
Synchaeta Sp.	51174							364	34	124	461	399	1441	886
Trichocerca Sp.	0							152	0	62	102	116	183	348
Total	113241							14357	5762	19891	34169	33566	49103	65503

Appendix 5-I. (Continued)

	Aug 1976							Nov 1976						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bosmina Longirostris	3757	6455	8531	17045	10428	5598	1682	1611	2046	2457	3492	2851	3127	5016
Camptocercus Rectirostris	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ceriodaphnia Imm.	0	0	0	0	0	0	0	0	1	2	28	39	61	6
Ceriodaphnia Lacustris	1	2	4	4	11	4	0	0	0	0	0	0	3	0
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	1	0	5	5	8	37
Ceriodaphnia Reticulata	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Chydorus Sp.	0	2	0	0	0	0	0	1	0	0	0	39	0	0
Daphnia Ambigua	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Imm.	148	0	125	251	861	1988	851	0	2	17	114	78	119	274
Daphnia Parvula	1	308	455	381	212	947	658	1	0	1	4	5	7	89
Daphnia Pulex	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Daphnia Retrocurva	546	871	2954	3149	3855	7671	5886	1	1	6	11	26	47	74
Diaphanosoma Leuchtenbergianum	1902	1887	10274	12558	12159	10862	10342	4	0	0	7	26	18	149
Ilyocryptus Imm.	0	0	0	0	0	0	0	0	0	0	0	19	0	0
Ilyocryptus Spinifer	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptodora Kindtii	17	34	87	21	20	25	2305	0	0	2	5	5	10	89
Leydigia Acanthocercoides	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Moina Micrura	6	1	319	515	10	433	911	0	0	0	0	0	0	0
Pleuroxus Denticulatus	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Pleuroxus Hamulatus	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Scapholebris Kingi	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Sida Crystallina	1	0	0	1	0	0	0	1	0	0	0	1	0	0
Simocephalus Imm.	0	0	0	265	531	0	0	0	0	0	0	0	0	0
Simocephalus Serrulatus	0	0	188	283	0	0	0	0	0	0	0	0	0	0
Total	6381	9560	22937	34475	28087	27528	22635	1623	2052	2485	3666	3095	3401	5737

Appendix 5-I. (Continued)

	Aug 1976							Nov 1976						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoid Imm.	196	415	1428	405	1094	345	802	8	29	42	128	97	129	328
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	1	1	2	2	3
Cyclopoid Imm.	646	1137	3421	2523	4248	3536	2107	57	55	174	616	984	1231	2389
Cyclops Bicuspidatus Thomasi	4	0	0	0	0	344	0	41	23	38	94	154	311	77
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	9	0	0	0	0	0	2
Cyclops Vernalis	359	1098	2237	1714	3144	3102	2009	6	33	58	41	78	111	22
Diaptomus Mississippiensis	0	0	0	1	2	0	0	0	0	0	0	0	0	0
Diaptomus Pallidus	168	70	106	94	93	73	41	3	4	2	9	3	13	9
Diaptomus Reighardi	4	117	77	26	28	260	382	1	0	3	8	7	9	4
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	0	0	1	0	0	86	2	0	1	1	2	1	2	2
Eucyclops Agilis	0	0	0	0	0	0	0	1	0	1	0	0	1	33
Eucyclops Prionophorus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoid Imm.	0	0	1	0	0	0	0	0	1	0	0	0	1	0
Harpacticoida	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Macrocyclops Albidus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	264	361	530	889	244	1981	1603	9	1	5	17	27	23	5
Nauplii	5500	5765	10107	19918	16301	5255	16208	579	284	782	3777	3585	5593	13160
Nitocra Lacustris	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Tropocyclops Prasinus	1	0	0	2	0	0	0	0	0	0	0	43	32	18
Total	7142	8963	17908	25572	25154	14983	23154	714	432	1107	4693	4981	7458	16052
Rotifera														
Asplanchna Sp.	1219	219	1895	3750	2994	88	5500	9	18	176	321	116	298	729
Brachionus Angularis	810	668	1719	2315	1413	604	1618	9	0	0	0	0	111	74
Brachionus Bidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1976							Nov 1976						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Budapestinensis	2061	400	643	1435	626	601	1529	0	11	85	68	116	166	411
Brachionus Calyciflorus	0	0	0	0	0	0	0	0	0	28	34	39	65	116
Brachionus Caudatus	216	0	0	0	106	0	79	0	0	0	0	20	0	0
Brachionus Quadridentatus	39	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalodella Sp.	0	0	0	0	0	0	0	28	11	0	0	0	0	0
Collotheca Sp.	401	1363	1770	3206	828	951	6187	57	83	199	261	271	412	1160
Conochiloides Sp.	737	2473	5363	8487	11065	2588	11089	0	0	0	0	0	0	0
Conochilus Hippocrepis	59	0	0	0	0	172	0	0	0	362	0	0	400	0
Conochilus Unicornis	2307	1030	1969	7790	4852	87	2102	113	18	58	0	39	0	192
Contracted Rotifera	0	0	0	0	0	0	0	0	18	0	0	0	18	0
Euchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Limnetica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	68	120	69	544	0	0	2028	0	0	0	0	0	29	0
Gastropus Sp.	344	0	188	2565	3081	518	1430	0	0	0	0	0	0	32
Hexarthra Intermedia	0	0	137	2787	1796	0	13333	0	0	0	0	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0	0	11	0	0	0	0	0
Hexarthra Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kellicottia Bostoniensis	30	0	0	0	106	0	0	76	0	0	34	58	47	0
Kellicottia Longispina	0	0	0	0	0	0	0	19	0	0	0	0	0	0
Keratella Sp.	8527	20638	64266	167000	148500	45565	86677	2913	4027	11974	18221	17933	19864	34954
Lecane Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monostyla Sp.	0	0	0	0	106	0	0	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	1188	0	0	0	0	0	0	28	27	0	57	84
Ploesoma Truncata	721	361	1300	4179	2507	1379	6361	11	87	144	0	135	272	74
Polyarthra Sp.	1492	1288	8715	27991	10708	2507	29026	468	579	3309	2550	1627	3858	5142
Rotaria Sp.	0	0	0	419	0	0	0	0	0	0	0	0	0	0
Synchaeta Sp.	351	671	2077	8228	2136	694	3482	222	482	862	2002	1890	2216	8133
Trichocerca Sp.	1049	1857	5361	15621	9336	2325	4031	74	40	824	1653	1600	1585	1266
Total	20431	31088	96660	256317	200160	58079	174472	3999	5385	18049	25171	23844	29398	52367

Appendix 5-I. (Continued)

	Feb 1977							May 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladocera														
Alona Quadrangularis	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Bosmina Longirostris	660	1037	711	537	826	466	984	15806	8758	6874	33161	17730	37702	29285
Camptocercus Rectirostris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	0	0	0	0	1	0	0	66	0	0	1
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Chydorus Sp.	2	7	0	0	0	0	0	3	19	1	1	1	1	1
Daphnia Ambigua	0	0	0	0	0	0	0	5	0	0	0	0	0	0
Daphnia Imm.	0	187	13	51	32	29	52	675	37	0	330	0	941	1652
Daphnia Parvula	0	0	5	12	124	21	16	193	40	383	1713	478	1882	3728
Daphnia Pulex	0	0	0	0	0	0	1	0	0	0	140	0	0	0
Daphnia Retrocurva	0	8	1	11	13	9	19	193	82	809	3360	2375	4195	4468
Diaphanosoma Leuchtenbergianum	0	0	0	115	0	0	0	96	2	147	560	207	264	820
Ilyocryptus Sordidus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ilyocryptus Spinifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptodora Kindtii	0	0	0	0	0	0	0	22	24	3	95	28	16	436
Leydigia Acanthocercoides	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Leydigia Quadrangularis	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Moina Imm.	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Moina Minuta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleuroxus Denticulatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleuroxus Hamulatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Imm.	0	0	0	0	0	0	0	2	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Feb 1977							May 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Scapholebris Kingi	0	0	0	0	0	0	0	5	0	0	0	0	0	0
Sida Crystallina	0	0	0	0	0	0	0	1	0	0	421	1	3	4
Sida Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simocephalus Imm.	0	0	0	0	1	0	0	0	0	0	0	0	0	
Simocephalus Serrulatus	0	0	0	0	0	0	0	0	1	1	0	1	0	0
Total	662	1239	731	726	997	526	1073	17007	8963	8218	39847	20821	45004	40395
Copepoda														
Calanoid Imm.	24	184	104	25	124	137	123	16	22	13	412	79	989	307
Canthocamptus Robertcokeri	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Cyclopoid Imm.	363	481	773	1495	831	1391	1985	289	160	243	2190	774	4539	6877
Cyclops Bicuspidatus Thomasi	86	184	314	320	260	464	554	24	97	62	486	3	312	704
Cyclops Varicans Rubellus	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Cyclops Vernalis	1	3	1	4	6	6	8	22	121	897	1095	848	2847	1485
Diaptomus Pallidus	0	0	0	2	5	6	10	5	1	2	9	76	6	6
Diaptomus Reighardi	0	2	4	7	5	14	1	1	2	8	22	13	16	15
Diaptomus Sanguineus	0	0	0	0	0	0	0	1	1	2	12	2	11	9
Ergasilus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Agilis	0	2	2	2	1	4	5	2	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Harpacticoid Imm.	0	0	0	0	0	0	0	0	0	0	0	74	0	0
Mesocyclops Edax	0	0	1	0	0	0	0	2	4	17	219	11	475	23
Nauplii	7872	11682	7955	13225	12358	11593	18856	2217	907	1354	11489	3838	20725	27592
Tropocyclops Prasinus	0	4	1	9	3	0	8	2	0	0	0	0	0	0
Total	8346	12542	9155	15090	13593	13616	21552	2581	1315	2598	15934	5718	29920	37018

Appendix 5-I. (Continued)

	Feb 1977							May 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera														
Asplanchna Sp.	360	317	444	422	169	462	984	15998	1364	10382	36950	12623	42624	35281
Brachionus Angularis	0	0	0	0	0	0	0	193	100	0	280	0	0	0
Brachionus Bidentata	0	0	0	0	0	0	0	578	21	0	0	0	0	0
Brachionus Budapestinensis	75	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Calyciflorus	1013	660	559	563	345	581	554	1831	166	412	1392	860	1465	1601
Brachionus Caudatus	0	0	0	0	0	0	108	0	0	0	0	0	0	0
Brachionus Havanaensis	0	0	0	0	0	0	0	0	0	0	0	0	0	128
Brachionus Quadridentatus	0	3	0	5	124	4	111	96	40	0	0	0	0	0
Brachionus Urceolaris	0	179	115	0	0	0	0	0	0	0	0	0	0	90
Cephalodella Sp.	0	2	99	0	0	0	0	96	0	0	0	0	155	0
Collotheca Sp.	446	303	0	0	0	0	85	0	103	206	692	1003	2075	1139
Conochiloides Sp.	0	0	0	0	0	0	0	193	229	516	1244	569	393	11766
Conochilus Hippocrepis	0	0	0	0	0	0	0	0	0	177	0	0	0	0
Conochilus Unicornis	75	0	0	0	0	0	0	8481	1088	3135	11658	12032	5755	26510
Contracted Rotifera	0	179	0	103	0	0	0	0	0	0	0	0	0	0
Epiphanes Macrourus	0	0	0	0	0	0	108	0	0	0	0	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	0	0	0	103	115	345	0	0	37	0	0	0	0	128
Gastropus Sp.	663	0	329	205	120	115	0	0	0	0	0	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexarthra Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kellicottia Bostoniensis	0	0	115	103	0	115	0	96	351	1236	2488	1264	155	1459
Keratella Sp.	34398	77591	44141	58556	62845	56766	62361	4337	2386	6953	20531	6730	12561	21112
Lecane Luna	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lecane Sp.	75	0	0	0	0	0	0	0	19	0	0	0	0	179
Monostyla Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Notholca Sp.	149	179	0	0	0	0	85	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Feb 1977							May 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Platyias Patulus	0	0	0	0	0	0	0	289	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	96	0	0	0	0	0	0
Ploesoma Truncata	72	0	0	0	0	0	0	193	82	133	626	211	0	0
Polyarthra Sp.	12583	37352	24193	29041	41373	34256	32071	5204	874	3625	15794	10016	21199	15227
Rotaria Neptunia	0	0	100	0	0	0	0	0	0	0	0	0	0	0
Rotaria Sp.	0	0	0	0	0	0	0	0	0	74	0	0	0	0
Synchaeta Sp.	42038	59627	35850	40657	42486	41138	46170	13878	10959	17811	39478	18010	33225	35171
Trichocerca Sp.	75	0	0	0	0	0	0	0	115	353	815	979	417	525
Total	92022	176392	105945	129758	147577	133782	142637	51559	17934	45013	131948	64297	120024	150316

Appendix 5-I. (Continued)

	Aug 1977							Nov 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulua Sp.	0	0	26	0	0	0	1	0	0	0	0	0	0	0
Total	0	0	26	0	0	0	1	0	0	0	0	0	0	0
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bosmina Longirostris	1229	1926	619	1651	1033	866	1442	398	907	1159	2342	1843	6903	1818
Camptocercus Rectirostris	0	0	0	0	0	0	0	6	0	1	0	0	0	0
Ceriodaphnia Lacustris	0	0	35	87	39	1	1	1	14	50	60	95	13	3
Ceriodaphnia Quadrangula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chydorus Sp.	1	0	0	0	0	0	0	13	49	35	0	0	0	0
Daphnia Ambigua	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Imm.	164	710	898	1642	1147	2159	761	0	32	2	118	6	198	214
Daphnia Parvula	55	169	131	372	418	657	1	0	83	7	234	41	25	9
Daphnia Pulex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Retrocurva	384	1249	1315	3646	4376	5171	508	0	18	1	61	76	16	10
Diaphanosoma Leuchtenbergianum	787	2296	3075	10190	7039	5252	8370	1	2	3	62	155	158	14
Ilyocryptus Sordidus	0	0	35	0	0	0	0	0	0	0	0	0	0	0
Ilyocryptus Spinifer	1	169	35	1	1	0	0	0	0	0	0	0	0	0
Leptodora Kindtii	29	36	61	21	41	37	90	0	0	2	0	0	0	0
Leydigia Acanthocercoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Imm.	38	34	87	993	276	311	845	0	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Minuta	19	135	77	1080	515	650	850	0	0	0	0	1	0	1
Pleuroxus Denticulatus	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Pleuroxus Hamulatus	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1977							Nov 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Scapholebris Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Sida Crystallina	1	34	0	1	46	0	169	0	0	0	1	0	0	0
Sida Imm.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simocephalus Serrulatus	0	0	0	0	0	1	0	0	0	0	0	1	0	1
Total	2708	6758	6368	19684	14932	15106	13038	420	1105	1261	2878	2218	7313	2070
Copepoda														
Calanoid Imm.	164	237	138	287	201	197	96	13	43	39	161	83	330	232
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	1	0	0	2	1	198	0
Cyclopoid Imm.	973	1689	1807	3239	2632	2348	2539	131	375	232	2214	2059	8409	2589
Cyclops Bisuspidatus Thomasi	0	0	35	1	1	34	0	7	14	3	4	165	152	0
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclops Vernalis	58	473	385	181	162	311	5	63	88	131	243	323	354	321
Diaptomus Pallidus	40	46	5	103	54	57	1	12	8	3	3	10	12	0
Diaptomus Reighardi	24	47	9	17	84	52	6	2	7	6	9	43	59	2
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Ergasilus Sp.	37	102	71	99	179	71	99	7	2	35	76	3	416	327
Eucyclops Agilis	1	1	0	0	0	0	0	7	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoid Imm.	0	0	0	0	0	0	0	0	1	1	0	1	0	0
Mesocyclops Edax	202	1081	459	1098	1510	1503	274	7	2	5	454	155	34	0
Nauplii	5610	7632	8194	14977	12402	9407	17514	429	555	1011	3065	3755	20298	7343
Tropocyclops Prasinus	0	0	0	0	0	0	1	1	0	0	0	2	294	1
Total	7109	11308	11103	20002	17225	13980	20535	680	1095	1466	6231	6600	30556	10823

Appendix 5-I. (Continued)

	Aug 1977							Nov 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera														
Asplanchna Sp.	1045	507	394	1624	1070	962	3484	42	54	538	675	685	15324	27496
Brachionus Angularis	5887	3648	3374	10011	7298	9381	49762	6	0	35	74	25	0	251
Brachionus Bidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Budapestinensis	476	68	87	985	509	244	508	5	41	18	0	95	686	806
Brachionus Calyciflorus	18	0	0	0	39	0	0	1	0	0	0	0	146	169
Brachionus Caudatus	111	0	0	0	0	0	0	0	0	0	0	0	0	63
Brachionus Havanaensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Quadridentatus	0	0	0	0	0	0	0	0	0	48	0	0	541	0
Brachionus Urceolaris	0	0	0	0	0	0	0	0	0	0	0	0	0	212
Cephalodella Sp.	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Collotheca Sp.	0	34	61	0	292	115	170	11	75	149	807	303	2310	950
Conochiloides Sp.	5380	6821	7243	17652	13412	15858	49697	0	0	0	0	0	0	0
Conochilus Hippocrepis	0	1286	0	0	0	0	0	0	0	0	0	0	0	0
Conochilus Unicornis	789	34	148	467	344	454	2548	21	189	101	306	486	8578	4822
Contracted Rotifera	92	0	26	449	46	34	172	0	0	0	0	0	0	0
Epiphanes Macrourus	55	0	0	0	0	0	0	0	0	0	0	0	0	0
Euchlanis Sp.	37	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gastropus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0	0	0	0	0	25	0	0
Hexarthra Sp.	0	0	106	0	46	0	510	0	0	0	0	0	0	0
Kellicottia Bostoniensis	0	0	35	0	39	0	0	5	16	18	74	74	396	0
Keratella Sp.	37	169	201	1211	979	555	4688	2202	10425	13136	23602	26485	33347	50901
Lecane Luna	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Lecane Sp.	128	34	0	0	0	0	0	0	0	0	0	0	0	0
Monostyla Sp.	18	0	0	0	0	0	0	0	0	0	0	0	0	0
Notholca Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Platyias Patulus	110	0	0	86	0	34	0	0	0	83	0	25	0	0

Appendix 5-I. (Continued)

	Aug 1977							Nov 1977						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Ploesoma Hudsoni	0	0	0	0	0	0	0	32	0	0	174	0	0	38
Ploesoma Truncata	293	507	570	4069	3238	3222	14601	68	339	206	865	120	2838	4499
Polyarthra Sp.	531	203	333	2263	1863	1056	4849	84	416	1321	1664	1487	15337	32332
Rotaria Neptunia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rotaria Sp.	0	0	0	0	0	0	0	32	14	18	0	25	0	1
Synchaeta Sp.	642	540	157	4209	3662	995	6198	450	1454	2240	1886	2283	37830	55986
Trichocerca Sp.	74	0	35	0	0	163	341	6	0	0	0	35	291	869
Total	15723	13851	12770	43026	32837	33073	137528	2967	13023	17911	30127	32153	117624	179396

Appendix 5-I. (Continued)

	May 1982							Aug 1982						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Rectangula	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Bosmina Longirostris	80973	87490	95409	48437	62411	43787	86893	4749	1942	3992	4919	5306	5352	3775
Bosminopsis Sp.	0	0	0	0	0	0	0	0	1445	0	0	0	0	0
Camptocercus Rectirostris	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Ceriodaphnia Imm.	0	0	0	0	0	0	0	0	0	20	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	0	0	0	0	102	18	53	267	1	4	31
Chydorus Sp.	160	0	0	0	0	0	0	0	1	0	0	0	0	0
Daphnia Galeata	322	315	62	0	401	803	373	32	1	20	3	0	0	1
Daphnia Imm.	0	99	0	0	144	0	0	0	0	19	42	0	0	19
Daphnia Parvula	142	0	0	0	72	0	0	33	48	2	87	60	0	30
Daphnia Pulex	0	0	0	0	0	140	49	0	0	116	0	0	44	0
Daphnia Retrocurva	1323	911	1759	902	572	260	439	345	84	350	636	248	245	1188
Diaphanosoma Leuchtenbergianum	157	0	1	0	206	0	70	104	152	225	1707	987	799	1332
Ilyocryptus Imm.	0	0	0	0	0	0	0	0	0	20	0	0	0	0
Ilyocryptus Spinifer	0	0	0	0	0	0	0	3	24	22	44	1	0	1
Leptodora Kindtii	9	4	7	144	0	2735	0	1	2	2	218	3	190	2
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Imm.	0	0	0	0	0	0	0	33	18	52	134	250	334	374
Moina Micrura	0	0	0	0	0	0	0	33	42	52	468	200	288	1091
Moina Minuta	0	0	0	0	0	0	0	0	0	0	0	141	0	0
Sida Crystallina	1	0	0	0	0	0	0	3	5	2	0	0	0	1
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	1	0	0	
Simocephalus Serrulatus	0	0	0	0	0	0	0	0	0	0	2	0	0	11
Simocephalus Vetulus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	83087	88819	97238	49483	63806	47725	87824	5438	3784	4947	8528	7197	7256	7856

Appendix 5-I. (Continued)

	May 1982							Aug 1982						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoid Imm.	86	68	691	144	575	380	266	34	5	3	7	10	115	73
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclopoid Imm.	5900	6031	11019	4835	9571	8278	10649	604	415	682	1823	1060	1997	1744
Cyclops Bicuspidatus Thomasi	402	536	2069	247	793	922	2078	0	12	0	2	1	3	1
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Cyclops Vernalis	629	3136	4707	2046	1533	1337	2887	13	95	367	85	98	177	23
Diaptomus Mississippiensis	0	3	0	0	0	0	0	2	12	1	3	3	1	2
Diaptomus Pallidus	165	223	321	217	168	328	84	1	1	5	6	5	9	20
Diaptomus Reighardi	328	153	201	578	0	595	0	4	2	22	112	5	85	20
Ergasilus Imm.	0	0	0	0	0	0	0	0	0	21	0	0	1	0
Ergasilus Sp.	0	0	0	0	0	0	0	1	50	72	1	53	104	1
Eucyclops Agilis	1	0	62	0	0	0	0	1	1	0	0	0	0	0
Eucyclops Prionophorus	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Mesocyclops Edax	541	1089	252	353	277	1309	2196	36	82	304	210	238	204	106
Nauplii	13875	545	7292	32529	23063	26722	33414	1820	1416	3084	6202	7565	7243	7405
Tropocyclops Prasinus	0	0	0	0	0	70	0	0	1	1	4	0	0	1
Total	21928	11784	26614	40949	35980	39941	51574	2516	2092	4562	8458	9038	9939	9396
Rotifera														
Asplanchna Sp.	51775	144	27385	45730	58014	39328	36168	553	149	39	1318	823	216	742
Bdelloidea	0	0	250	0	0	0	0	22	0	80	239	108	103	0
Brachionus Angularis	0	0	0	0	0	0	0	5228	1942	5577	16941	8244	8472	8869
Brachionus Bidentata	79	0	0	0	0	0	0	0	0	0	464	0	0	0
Brachionus Budapestinensis	0	0	0	0	0	0	0	2252	127	130	1876	945	364	882

Appendix 5-I. (Continued)

	May 1982							Aug 1982						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Calyciflorus	1249	0	62	144	72	70	551	278	0	21	43	0	0	44
Brachionus Caudatus	0	0	0	0	0	0	0	769	23	0	365	141	0	382
Brachionus Havanaensis	0	0	0	0	0	0	0	11	0	0	0	0	0	0
Brachionus Quadridentatus	315	0	124	0	0	0	0	0	0	0	0	0	0	0
Collotheca Sp.	299	0	0	0	0	239	98	65	24	60	259	196	385	38
Conochiloides Sp.	3470	193	0	0	409	1879	1672	5395	2822	4612	25712	10957	11976	12529
Conochilus Hippocrepis	0	0	0	0	0	0	0	44	6	0	0	0	0	0
Conochilus Unicornis	16981	49	0	916	0	5153	4224	3584	222	347	260	270	88	1617
Contracted Rotifera	0	0	0	0	0	0	0	0	0	0	106	0	0	19
Epiphanes Macrourus	0	0	62	0	0	0	0	0	0	19	0	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	0	0	0	196	0	0	133	22	0	0	0	0	0	0
Hexarthra Intermedia	0	0	0	0	0	0	0	43	45	51	1313	1287	252	1211
Hexarthra Mira	0	0	0	140	0	0	0	0	0	0	0	0	65	0
Kellicottia Bostoniensis	643	127	88	711	0	2115	1922	0	0	21	0	0	216	0
Kellicottia Longispina	220	99	1258	2385	2378	772	3708	0	0	21	0	0	38	0
Keratella Sp.	13971	4025	40835	25233	22453	28615	26581	43	18	80	276	279	385	304
Platyias Patulus	0	0	0	0	0	0	0	55	57	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	11	6	0	0	25	0	0
Ploesoma Sp.	0	0	0	0	0	0	18671	0	0	0	0	0	0	0
Ploesoma Truncata	71	144	744	825	0	140	105	477	115	950	14184	6528	13296	8792
Polyarthra Sp.	5548	144	387	59620	30105	30176	6457	1432	31	463	4612	5099	2417	1861
Rotaria Sp.	0	0	0	0	0	0	0	0	80	0	0	0	0	0
Synchaeta Sp.	2117	144	365	6555	7190	7933	2965	1097	166	405	3289	3219	2291	3015
Trichocerca Sp.	0	0	0	0	0	60	69	54	0	62	322	431	495	106
Total	96738	5069	71560	142455	120621	116480	103324	21435	5833	12938	71579	38552	41059	40411

Appendix 5-I. (Continued)

	Nov 1982						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera							
Alona Rectangula	9	1	0	0	0	0	0
Bosmina Longirostris	2755	2260	1860	5063	4941	5655	3508
Bosminopsis Sp.	0	0	0	0	0	0	0
Camptocercus Rectirostris	1	0	1	0	0	0	0
Ceriodaphnia Imm.	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	1	5	21	1	3	36	2
Chydorus Sp.	1	0	0	0	0	0	0
Daphnia Galeata	0	0	0	0	0	1	0
Daphnia Imm.	0	11	0	0	65	0	0
Daphnia Parvula	0	0	0	1	26	0	0
Daphnia Pulex	0	1	0	20	0	1	1
Daphnia Retrocurva	5	0	0	0	39	2	28
Diaphanosoma Leuchtenbergianum	0	0	6	0	0	33	26
Ilyocryptus Imm.	0	0	0	0	0	0	0
Ilyocryptus Spinifer	0	0	0	0	1	0	0
Leptodora Kindtii	0	0	1	1	0	0	1
Leydigia Quadrangularis	0	0	1	0	0	0	0
Moina Imm.	0	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0
Moina Minuta	0	0	0	0	0	0	0
Sida Crystallina	1	0	0	1	0	0	1
Simocephalus Imm.	0	0	0	0	0	0	0
Simocephalus Serrulatus	0	0	0	0	0	0	0
Simocephalus Vetulus	1	0	0	0	0	0	0
Total	2774	2278	1890	5087	5075	5728	3567

Appendix 5-I. (Continued)

	Nov 1982						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda							
Calanoid Imm.	13	15	12	30	6	108	50
Canthocamptus Robertcokeri	0	0	0	0	1	0	1
Cyclopoid Imm.	116	53	90	250	643	2954	1146
Cyclops Bicuspidatus Thomasi	33	21	1	4	3	101	15
Cyclops Varicans Rubellus	0	0	0	0	0	0	0
Cyclops Vernalis	28	45	88	100	42	345	108
Diaptomus Mississippiensis	1	0	0	1	0	3	25
Diaptomus Pallidus	0	0	1	0	0	35	12
Diaptomus Reighardi	2	1	0	5	2	8	18
Ergasilus Imm.	0	0	0	0	0	0	0
Ergasilus Sp.	1	8	3	1	0	34	12
Eucyclops Agilis	0	0	0	0	0	0	0
Eucyclops Prionophorus	0	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	0	0	0	0
Mesocyclops Edax	28	1	9	10	6	33	18
Nauplii	373	130	529	960	872	3309	3187
Tropocyclops Prasinus	2	1	6	1	27	3	3
Total	597	275	739	1362	1602	6933	4595
Rotifera							
Asplanchna Sp.	38	29	161	496	896	355	480
Bdelloidea	0	1	0	38	26	20	0
Brachionus Angularis	0	0	0	35	150	33	30
Brachionus Bidentata	0	13	8	8	13	33	16
Brachionus Budapestinensis	0	11	0	17	0	0	0

Appendix 5-I. (Continued)

	Nov 1982						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Calyciflorus	0	0	0	0	27	10	0
Brachionus Caudatus	0	0	0	0	0	0	0
Brachionus Havanaensis	0	0	0	0	13	0	0
Brachionus Quadridentatus	0	0	0	0	0	0	0
Collotheca Sp.	8	0	25	158	93	135	79
Conochiloides Sp.	0	0	6	0	42	114	222
Conochilus Hippocrepis	0	0	0	0	0	0	0
Conochilus Unicornis	0	0	12	26	82	222	177
Contracted Rotifera	0	0	0	0	0	0	0
Epiphanes Macrourus	0	0	0	0	0	0	0
Euchlanis Sp.	11	5	27	0	0	0	0
Filinia Longiseta	0	0	0	0	0	0	0
Hexarthra Intermedia	0	0	6	19	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0
Kellicottia Bostoniensis	0	0	20	196	188	341	328
Kellicottia Longispina	0	0	0	0	0	0	0
Keratella Sp.	247	106	537	2597	4115	6388	4833
Platyias Patulus	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0
Ploesoma Sp.	0	0	0	0	0	0	0
Ploesoma Truncata	0	0	6	34	28	30	0
Polyarthra Sp.	76	8	424	1918	4125	2524	3277
Rotaria Sp.	0	0	0	0	0	0	0
Synchaeta Sp.	130	47	264	1248	5300	4196	3625
Trichocerca Sp.	0	0	15	65	0	29	28
Total	510	220	1511	6855	15098	14430	13095

Appendix 5-I. (Continued)

	Feb 1983							June 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Quadrangularis	0	0	1	1	0	0	0	1	0	0	0	1	0	0
Alona Rectangula	0	0	0	0	0	0	0	1	0	0	0	0	0	73
Alonella Sp.	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Bosmina Longirostris	1672	505	230	334	526	460	849	766	1349	10041	7794	4621	4230	5000
Camptocercus Rectirostris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	0	0	0	0	0	0	0	0	0	1	0	0	3	73
Chydorus Sp.	134	0	23	0	0	1	1	0	0	1	0	1	1	1
Daphnia Galeata	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Daphnia Imm.	0	31	0	8	0	9	33	1	1	220	3	1	7	1
Daphnia Parvula	0	0	11	0	0	0	99	1	0	0	0	0	3	1
Daphnia Pulex	0	1	0	0	0	0	0	0	0	0	1	285	0	0
Daphnia Retrocurva	75	61	11	17	15	3	1	2	3	479	470	2282	22160	268
Diaphanosoma Leuchtenbergianum	0	0	0	0	0	0	0	9	1	302	2	4203	1400	147
Eurycercus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Holopedium Gibberum	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Ilyocryptus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ilyocryptus Spinifer	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Leptodora Kindtii	0	0	0	0	0	0	0	0	2	7	4	4	22	1
Leydigia Acanthocercoides	0	0	2	0	1	0	0	0	0	0	0	0	0	0
Leydigia Quadrangularis	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Moina Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Pleuroxus Denticulatus	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Pleuroxus Hamulatus	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0	0	2	3	1	0	0	1
Sida Crystallina	1	0	0	0	0	1	1	1	1	0	0	857	3	75
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	1	

Appendix 5-I. (Continued)

	Feb 1983							June 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Simocephalus Serrulatus	0	0	0	0	0	0	0	10	0	0	0	0	0	0
Simocephalus Vetulus	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Total	1885	598	278	360	543	475	985	794	1360	11054	8275	12255	27831	5643
Copepoda														
Calanoid Imm.	198	17	26	62	33	37	41	1	3	6	13	12	40	2
Canthocamptus Robertcokeri	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Cyclopoid Imm.	275	178	220	152	281	101	113	63	40	4	167	364	3687	1340
Cyclops Bicuspidatus Thomasi	3	32	7	10	4	27	34	4	1	1	1	1	10	1
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	5	0	2	0
Cyclops Vernalis	4	0	38	2	0	54	0	1	106	5	310	83	283	2
Diaptomus Birgeri	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Diaptomus Bogalusensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Mississippiensis	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Diaptomus Pallidus	0	0	0	0	1	1	1	1	3	8	14	82	50	2
Diaptomus Reighardi	0	0	0	0	0	0	0	1	3	6	10	79	23	2
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Ergasilus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Agilis	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Eucyclops Prionophorus	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoid Imm.	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	0	0	2	0	8	0	23	1	46	8	5	5	33	5
Nauplii	1588	1735	1244	717	1493	923	998	409	512	751	2835	5444	9623	3919
Nitocra Lacustris	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Tropocyclops Prasinus	0	0	0	0	1	0	0	0	0	1	0	0	0	1
Total	2070	1963	1537	943	1821	1143	1213	481	715	791	3361	6070	13751	5276

Appendix 5-I. (Continued)

	Feb 1983							June 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera														
Asplanchna Sp.	234	38	61	99	78	56	272	216	763	14850	9787	20474	20627	6951
Bdelloidea	0	0	0	17	15	6	0	0	0	1	157	0	0	0
Brachionus Angularis	0	61	25	8	0	0	0	640	5447	24621	21037	15622	25007	8109
Brachionus Bennini	0	0	0	0	0	0	0	0	0	0	0	207	0	0
Brachionus Bidentata	2	0	1	8	0	0	0	0	0	409	106	0	0	0
Brachionus Budapestinensis	0	0	0	0	0	0	0	19	22	189	157	0	1397	0
Brachionus Calyciflorus	0	6	21	0	50	12	11	20	22	431	784	1758	1210	491
Brachionus Caudatus	0	0	0	0	20	0	11	0	0	150	0	0	0	0
Brachionus Havanaensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Quadridentatus	0	0	2	0	0	0	7	10	0	150	0	0	0	0
Cephalodella Sp.	51	31	39	17	43	0	0	0	0	0	0	0	0	0
Collotheca Sp.	152	88	0	67	47	38	285	282	471	6500	2793	3904	4253	1930
Conochiloides Sp.	0	0	0	0	144	22	0	4	166	5230	1600	1030	0	418
Conochilus Hippocrepis	3	0	104	118	267	27	0	69	105	0	106	207	280	119
Conochilus Unicornis	0	0	0	0	0	6	0	172	2509	9171	13949	13322	4013	6972
Contracted Rotifera	0	0	0	0	0	26	0	0	0	0	0	0	0	0
Epiphanes Macrourus	0	6	76	258	90	0	0	0	0	0	0	0	0	0
Euchlanis Sp.	62	0	0	0	20	18	0	0	0	0	0	0	0	0
Filinia Limnetica	0	0	0	0	0	0	0	0	0	0	0	0	0	146
Filinia Longiseta	0	61	32	8	43	64	0	24	9	300	955	439	1310	657
Hexarthra Intermedia	0	0	0	0	0	0	0	0	0	378	0	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0	0	0	0	0	0	0	179
Kellicottia Bostoniensis	0	15	0	8	23	0	0	12	163	70	0	207	483	0
Kellicottia Longispina	0	0	0	0	0	6	0	31	0	0	106	0	0	0
Keratella Sp.	1957	1567	466	1501	3756	1625	3567	3151	9261	45040	119447	106862	160813	63116
Lecane Sp.	0	0	0	0	0	13	0	0	0	0	0	0	0	0
Notholca Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Feb 1983							June 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Platyias Patulus	0	0	0	0	0	0	0	0	22	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	35	0	0	0	0	1	0
Ploesoma Sp.	0	0	0	0	0	0	0	0	0	0	0	0	843	0
Ploesoma Truncata	0	0	0	49	0	0	0	55	145	610	623	856	1880	418
Polyarthra Sp.	1190	349	501	1950	215	734	837	126	182	36412	16163	58563	26120	22056
Rotaria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	11823
Synchaeta Sp.	19037	14578	19962	14180	17111	10489	16750	607	451	8432	7175	31174	11677	5606
Testudinella Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	2687
Trichocerca Sp.	0	0	0	0	0	0	0	32	437	3329	2283	5611	4750	291
Trichotria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	22688	16800	21290	18288	21922	13142	21740	5505	20175	156273	197228	260236	264664	131969

Appendix 5-I. (Continued)

	Aug 1983							Nov 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alona Rectangula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alonella Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bosmina Longirostris	7256	13354	9528	6778	7430	11345	8385	12198	4420	9441	13427	18494	31446	8012
Camptocercus Rectirostris	9	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	16	0	0	0	0	0	0	14	1	1	3	100	92	1
Chydorus Sp.	0	0	0	0	0	0	0	9	1	0	1	0	58	0
Daphnia Galeata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daphnia Imm.	0	13	0	0	43	0	365	1	0	1	154	157	136	9
Daphnia Parvula	0	0	34	42	38	0	0	0	0	17	84	254	311	27
Daphnia Pulex	0	0	0	0	124	0	0	0	0	0	1	0	0	19
Daphnia Retrocurva	223	165	263	1397	791	1138	1641	73	0	11	192	142	848	168
Diaphanosoma Leuchtenbergianum	198	573	552	4603	2540	2634	6785	0	0	0	2	1	52	1
Eurycercus Sp.	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Holopedium Gibberum	0	0	0	0	0	0	0	0	0	0	1	1	2	1
Ilyocryptus Imm.	0	0	29	0	0	0	0	0	0	0	0	0	0	0
Ilyocryptus Spinifer	0	0	1	0	36	0	0	0	0	0	0	0	1	0
Leptodora Kindtii	43	34	2	0	0	0	0	2	1	1	2	3	2	2
Leydigia Acanthocercoides	0	0	0	0	363	0	0	0	0	0	1	0	2	0
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Moina Imm.	0	34	0	36	0	197	0	0	0	0	0	0	0	0
Moina Micrura	0	0	0	81	0	296	0	0	0	0	0	0	0	0
Pleuroxus Denticulatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleuroxus Hamulatus	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sida Crystallina	0	0	30	0	0	0	0	1	0	0	1	0	0	0
Simocephalus Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1983							Nov 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Simocephalus Serrulatus	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Simocephalus Vetulus	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	7745	14173	10439	12937	11365	15610	17176	12299	4423	9473	13870	19153	32951	8241
Copepoda														
Calanoid Imm.	26	325	3	0	0	278	0	18	2	2	122	18	132	15
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Cyclopoid Imm.	449	579	1221	992	1868	5540	1654	82	136	67	794	591	2912	840
Cyclops Bicuspidatus Thomasi	0	0	130	0	0	0	0	15	8	33	1	101	157	10
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Ctclops Vernalis	0	498	758	742	419	519	0	48	103	21	95	277	1082	142
Diaptomus Birgeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Bogalusensis	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Mississippiensis	0	0	29	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Pallidus	0	42	0	0	0	0	0	13	9	3	5	8	126	5
Diaptomus Reighardi	26	0	1	0	0	0	0	22	5	1	33	6	46	38
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	0	0	0	0	0	0	0	0	1	1	1	50	1	0
Eucyclops Agilis	34	0	0	0	0	0	0	0	0	1	0	0	1	0
Eucyclops Prionophorus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Harpacticoid Imm.	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Mesocyclops Edax	34	80	687	522	628	268	0	14	1	6	5	108	274	19
Nauplii	2386	1571	3207	9209	8948	15046	9935	282	160	453	2492	3190	12341	3612
Nitocra Lacustris	0	0	0	0	0	0	0	0	0	1	2	2	1	0
Tropocyclops Prasinus	0	0	0	0	0	0	0	23	0	0	28	2	1	28
Total	2955	3095	6037	11465	11863	21651	11589	517	425	589	3580	4355	17076	4711

Appendix 5-I. (Continued)

	Aug 1983							Nov 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera														
Asplanchna Sp.	582	13	398	1112	735	447	2052	102	0	65	449	1417	2643	591
Bdelloidea	0	0	33	0	0	0	0	0	0	0	0	0	0	0
Brachionus Angularis	2535	3920	8336	5664	7414	3107	14693	20	13	383	404	12	213	262
Brachionus Bennini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Bidentata	9	0	0	0	0	0	0	0	0	0	0	0	110	14
Brachionus Budapestinensis	1881	839	2553	2673	3538	1694	0	0	0	0	0	0	0	0
Brachionus Calyciflorus	164	0	65	0	0	0	2010	0	0	0	0	0	155	60
Brachionus Caudatus	281	338	672	1739	374	692	4467	0	0	0	0	50	0	100
Brachionus Havanaensis	9	0	0	0	0	0	0	0	0	0	0	50	0	0
Brachionus Quadridentatus	52	0	121	0	0	0	91	0	0	0	0	155	52	19
Cephalodella Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collotheca Sp.	16	68	136	290	1147	341	272	40	4	176	642	935	1308	422
Conochiloides Sp.	3361	2196	4441	704	1524	4331	4805	60	0	71	133	181	0	28
Conochilus Hippocrepis	66	0	160	36	38	0	0	0	0	0	0	0	0	0
Conochilus Unicornis	2035	85	447	870	1904	305	57	0	0	147	290	162	2142	530
Contracted Rotifera	0	0	29	0	0	0	0	0	0	17	0	0	0	14
Epaphanes Macrourus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Limnetica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	0	0	0	0	0	161	0	0	0	0	0	0	0	11
Hexarthra Intermedia	16	0	0	803	0	107	686	0	0	0	0	0	136	52
Hexarthra Mira	0	13	0	0	508	0	272	0	0	0	0	99	0	0
Kellicottia Bostoniensis	0	0	29	0	0	0	0	0	0	1	0	0	0	0
Kellicottia Longispina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keratella Sp.	422	295	1213	3884	7581	3788	2827	654	278	3585	6991	6984	11686	3329
Lecane Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Notholca Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	11

Appendix 5-I. (Continued)

	Aug 1983							Nov 1983						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Platyias Patulus	26	0	29	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	1688	0	15	0	0	0	85	103	37
Ploesoma Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Truncata	414	916	4871	11434	11099	2771	11519	0	7	77	0	163	350	73
Polyarthra Sp.	786	0	309	3700	5820	3590	21627	49	53	542	3604	10752	12440	2175
Rotaria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchaeta Sp.	195	71	583	6532	1375	1989	7027	101	14	153	2089	1695	4926	2978
Testudinella Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichocerca Sp.	112	182	454	253	1173	1226	2428	0	0	0	0	0	52	14
Trichotria Sp.	0	0	0	127	489	0	0	0	0	0	0	0	0	0
Total	12962	8936	24879	39821	44719	26237	74833	1041	369	5217	14602	22740	36316	10720

Appendix 5-I. (Continued)

	Feb 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera							
Alonella Sp.	38	0	0	0	0	0	0
Bosmina Longirostris	411	175	407	749	508	537	546
Ceriodaphnia Quadrangula	0	0	0	0	20	0	0
Chydorus Sp.	233	11	3	7	4	128	360
Daphnia Imm.	0	0	1	0	0	0	0
Daphnia Parvula	75	1	3	1	0	0	24
Daphnia Pulex	0	0	0	2	2	0	1
Daphnia Retrocurva	42	1	1	0	1	1	1
Eurycercus Sp.	0	0	0	3	0	0	0
Ilyocryptus Imm.	1	0	0	0	0	0	0
Ilyocryptus Spinifer	0	1	0	0	0	0	0
Leptodora Kindtii	0	0	0	1	0	0	0
Leydigia Acanthocercoides	1	0	0	4	0	24	0
Leydigia Quadrangularis	1	1	2	0	9	0	9
Pleuroxus Denticulatus	1	1	1	0	0	0	0
Sida Crystallina	0	0	0	0	0	0	1
Simocephalus Imm.	0	0	0	1	0	0	
Simocephalus Serrulatus	0	0	1	0	0	0	1
Total	803	191	419	768	544	690	943
Copepoda							
Calanoid Imm.	6	2	22	16	4	11	2
Cyclopoid Imm.	335	77	150	725	636	602	1132
Cyclops Bicuspidatus Thomasi	4	2	59	84	202	9	121
Cyclops Vernalis	42	10	45	126	3	3	66
Diaptomus Pallidus	2	1	22	1	2	0	3

Appendix 5-I. (Continued)

	Feb 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Diaptomus Reighardi	1	0	1	2	0	0	1
Eucyclops Agilis	1	1	1	0	0	0	1
Eucyclops Speratus	0	1	0	0	0	0	0
Harpacticoid Imm.	1	0	0	0	0	0	1
Mesocyclops Edax	1	1	0	41	1	1	0
Nauplii	2452	817	3114	3301	6183	2411	5425
Nitocra Lacustris	1	0	0	0	0	0	1
Tropocyclops Prasinus	75	0	1	1	0	0	1
Total	2921	912	3415	4297	7031	3037	6754
Rotifera							
Asplanchna Sp.	158	115	217	54	116	175	330
Bdelloidea	38	8	27	3	0	0	0
Brachionus Angularis	8	35	0	33	155	0	0
Brachionus Bennini	0	0	0	0	0	1	0
Brachionus Calyciflorus	94	7	137	123	1	19	192
Brachionus Caudatus	0	0	0	0	0	0	24
Brachionus Urceolaris	0	0	17	0	0	0	0
Collotheca Sp.	56	21	65	0	0	0	0
Conochiloides Sp.	0	0	0	0	0	18	24
Conochilus Hippocrepis	0	0	0	25	41	1	0
Conochilus Unicornis	75	0	0	0	61	0	0
Contracted Rotifera	19	0	0	0	0	0	0
Epiphanes Macrourus	0	0	34	0	0	17	0
Euchlanis Sp.	4	0	0	1	0	0	24
Filinia Limnetica	38	7	20	0	0	0	0
Filinia Longiseta	0	0	27	0	0	17	139

Appendix 5-I. (Continued)

	Feb 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Kellicottia Bostoniensis	26	15	48	241	39	42	173
Kellicottia Longispina	38	0	0	41	0	0	64
Keratella Sp.	6229	2459	5754	8039	7845	3629	10562
Polyarthra Sp.	2365	535	1081	1712	2884	885	3063
Synchaeta Sp.	6162	2771	5209	12002	8802	6390	12250
Trichocerca Sp.	0	0	0	0	61	17	50
Trichotria Sp.	0	0	0	0	0	53	0
Total	15310	5973	12636	22274	20005	11264	26895

Appendix 5-I. (Continued)

	May 1984							Aug 1984						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura														
Argulus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Cladocera														
Bosmina Longirostris	1820	1378	1776	12308	6453	7696	8733	5154	8803	2514	3430	2834	2645	4076
Ceriodaphnia Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	1	8	0	1	0	1	2	25	1	24	110	3	95	273
Chydorus Sp.	1	15	2	0	0	0	1	1	0	0	0	0	0	0
Daphnia Ambigua	0	0	1	0	2	31	1	0	0	0	0	0	0	0
Daphnia Galeata	0	0	0	0	0	0	0	0	0	0	0	0	0	47
Daphnia Imm.	0	0	0	74	7	31	177	5	110	78	173	205	1	47
Daphnia Parvula	0	0	0	500	7	0	202	0	0	0	0	0	0	0
Daphnia Pulex	0	0	0	74	67	81	1	0	0	0	0	0	0	135
Daphnia Retrocurva	36	7	51	350	284	135	883	315	101	93	593	898	270	1112
Diaphanosoma Leuchtenbergianum	45	1	1	0	145	34	3	243	152	3	207	379	270	4545
Eurycercus Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Holopedium Gibberum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ilyocryptus Imm.	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Ilyocryptus Sordidus	0	0	0	0	0	0	0	0	0	36	0	0	0	0
Ilyocryptus Spinifer	0	0	0	0	0	0	0	1	1	2	2	0	2	0
Leptodora Kindtii	1	2	0	2	10	1	1	1	14	5	5	5	1	7
Leydigia Acanthocercoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macrothrix Laticornis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macrothrix Rosea	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Appendix 5-I. (Continued)

	May 1984							Aug 1984						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Moina Imm.	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Moina Micrura	0	0	0	0	0	0	0	1	0	0	1	1	48	47
Pleuroxus Denticulatus	0	0	1	0	0	1	0	1	0	0	1	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Sida Crystallina	1	2	0	2	0	1	1	6	19	2	1	0	1	0
Simocephalus Serrulatus	1	0	0	1	0	1	0	0	0	0	0	0	0	0
Total	1906	1413	1832	13312	6975	8013	10006	5754	9202	2758	4524	4326	3333	10289
Copepoda														
Calanoid Imm.	5	3	7	272	284	102	283	23	18	8	155	4	15	53
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	21	0	1	0	0
Cyclopoid Imm.	127	168	259	2425	1381	3163	2750	540	1021	623	616	886	1538	5121
Cyclops Bicuspidatus Thomasi	28	2	24	142	295	129	156	0	0	0	91	0	0	0
Cyclops Varicans Rubellus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclops Vernalis	13	39	33	489	287	512	335	79	84	107	152	3	55	131
Diaptomus Mississippiensis	1	1	0	2	0	0	0	0	1	0	0	1	1	2
Diaptomus Pallidus	2	1	3	6	20	56	11	71	5	31	25	5	3	46
Diaptomus Reighardi	2	2	5	119	15	145	19	48	40	97	29	22	49	4
Ergasilus Sp.	0	0	0	0	0	0	0	0	0	22	1	0	1	1
Eucyclops Agilis	0	0	0	0	0	0	0	5	0	0	0	0	0	0
Harpacticoid Imm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesocyclops Edax	16	1	5	31	281	22	3	29	119	206	465	233	698	1418
Nauplii	616	414	437	3255	1937	3287	5015	2263	1386	907	3211	8406	4987	16407
Tropocyclops Prasinus	1	1	0	63	0	1	0	31	13	1	1	32	1	90
Total	811	632	773	6804	4500	7417	8572	3089	2687	2023	4746	9593	7348	23273

Appendix 5-I. *(Continued)*

	May 1984							Aug 1984						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera														
Asplanchna Sp.	468	199	1014	1990	2101	1520	8896	1485	269	1309	1251	569	617	1323
Bdelloidea	0	0	0	0	0	0	0	51	35	21	105	0	0	0
Brachionus Angularis	120	31	0	159	74	81	383	2096	3238	5057	10458	11522	6410	16836
Brachionus Bennini	0	0	0	0	0	0	0	0	1607	0	0	2044	0	47
Brachionus Bidentata	9	0	0	0	0	0	0	0	0	0	91	0	0	0
Brachionus Budapestinensis	17	0	0	0	0	0	0	1599	1222	2323	5641	7976	6159	8811
Brachionus Calyciflorus	26	7	95	63	214	123	25	1037	192	231	826	600	339	140
Brachionus Caudatus	14	0	0	0	67	0	0	639	194	620	621	1738	231	597
Brachionus Quadridentatus	10	36	42	127	7	0	130	62	0	0	0	0	0	0
Cephalodella Sp.	0	0	0	0	0	164	0	0	0	0	0	0	0	0
Collotheca Sp.	42	32	211	843	679	909	960	0	43	228	19	648	506	1098
Conochiloides Sp.	125	11	150	0	7	0	202	659	3523	3554	5251	3037	4023	5936
Conochilus Hippocrepis	0	0	0	0	0	82	130	0	0	0	0	96	0	0
Conochilus Unicornis	723	266	3610	15318	18468	6931	46203	598	884	620	814	2651	1036	4721
Contracted Rotifera	0	0	0	0	7	0	0	0	0	0	0	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	47	0
Filinia Longiseta	15	70	28	116	144	265	383	21	0	0	0	0	0	78
Gastropus Sp.	0	0	0	0	0	0	0	0	0	0	23	0	0	0
Hexarthra Intermedia	0	0	0	0	0	0	0	80	0	130	19	3551	15	47
Hexarthra Mira	0	0	0	0	0	0	0	0	0	72	23	0	94	0
Kellicottia Bostoniensis	0	15	0	0	0	0	130	0	0	0	0	0	12	0
Kellicottia Longispina	15	5	14	157	74	0	177	0	0	0	0	0	47	0
Keratella Sp.	1677	1069	3194	26050	15652	10509	14250	648	784	597	1567	4752	1912	3303
Lecane Sp.	5	0	0	0	0	0	0	0	0	42	19	0	0	0
Monostyla Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Platyias Patulus	19	0	0	0	67	0	0	31	30	0	0	0	0	0
Ploesoma Hudsoni	1	0	0	63	0	1	640	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	May 1984							Aug 1984						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Ploesoma Truncata	0	0	0	187	0	0	257	508	1202	5285	18894	18084	4084	10508
Polyarthra Sp.	192	45	889	5251	7775	7213	18574	1346	510	3130	3487	9792	3320	3295
Rotaria Sp.	0	0	0	0	0	51	0	0	0	0	0	0	0	0
Synchaeta Sp.	3302	4319	20073	80878	71240	55954	171565	461	286	1163	1895	3767	1238	2303
Trichocerca Sp.	7	26	24	0	134	0	1473	48	42	54	328	1889	587	1339
Trichotria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	45
Total	6787	6131	29344	131202	116710	83803	264378	11369	14061	24436	51332	72716	30677	60427

Appendix 5-I. (Continued)

	Nov 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Branchiura							
Argulus Sp.	0	0	0	0	0	1	0
Total	0	0	0	0	0	1	0
Cladocera							
Bosmina Longirostris	1234	4094	4396	11728	17161	10990	17320
Ceriodaphnia Imm.	0	0	0	0	0	5	0
Ceriodaphnia Lacustris	0	0	0	0	1	15	0
Chydorus Sp.	0	0	0	0	0	0	11
Daphnia Ambigua	0	0	0	1	0	0	0
Daphnia Galeata	0	0	0	0	0	0	0
Daphnia Imm.	0	0	4	0	0	10	11
Daphnia Parvula	0	0	0	108	54	103	90
Daphnia Pulex	0	0	1	0	10	0	245
Daphnia Retrocurva	13	6	14	47	96	76	97
Diaphanosoma Leuchtenbergianum	2	0	9	17	11	34	135
Eurycercus Sp.	2	0	0	0	0	0	0
Holopedium Gibberum	0	0	0	0	0	0	1
Ilyocryptus Imm.	0	0	0	0	0	0	0
Ilyocryptus Sordidus	0	0	0	0	0	0	0
Ilyocryptus Spinifer	0	3	0	0	0	0	0
Leptodora Kindtii	21	2	4	83	81	33	18
Leydigia Acanthocercoides	0	0	3	0	0	0	0
Leydigia Quadrangularis	0	0	0	1	1	0	0
Macrothrix Laticornis	0	0	0	0	1	0	0
Macrothrix Rosea	0	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Nov 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Moina Imm.	0	0	0	0	0	0	0
Moina Micrura	0	0	0	0	0	0	0
Pleuroxus Denticulatus	1	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0
Sida Crystallina	2	0	0	0	0	0	0
Simocephalus Serrulatus	0	0	0	1	0	0	0
Total	1275	4105	4431	11986	17416	11266	17928
Copepoda							
Calanoid Imm.	10	4	2	21	19	25	109
Canthocamptus Robertcokeri	1	2	1	1	0	5	0
Cyclopoid Imm.	63	122	321	1496	1818	1490	4583
Cyclops Bicuspidatus Thomasi	1	8	0	19	39	0	0
Cyclops Varicans Rubellus	0	0	0	0	0	58	0
Cyclops Vernalis	60	118	390	187	208	310	70
Diaptomus Mississippiensis	0	0	0	0	0	0	0
Diaptomus Pallidus	6	2	4	33	9	15	25
Diaptomus Reighardi	7	4	6	56	13	20	26
Ergasilus Sp.	0	0	3	0	2	2	1
Eucyclops Agilis	0	41	6	0	0	0	0
Harpacticoid Imm.	0	0	1	0	7	0	0
Mesocyclops Edax	2	19	32	76	113	116	90
Nauplii	315	254	297	2526	3440	3104	9225
Tropocyclops Prasinus	0	1	3	15	5	5	54
Total	465	575	1066	4430	5673	5150	14183

Appendix 5-I. (Continued)

	Nov 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Rotifera							
Asplanchna Sp.	14	6	0	0	0	0	32
Bdelloidea	0	0	0	0	0	0	0
Brachionus Angularis	15	3	1	5	14	0	239
Brachionus Bennini	0	0	0	0	0	0	0
Brachionus Bidentata	0	0	0	0	0	0	0
Brachionus Budapestinensis	10	0	0	0	0	0	21
Brachionus Calyciflorus	8	3	0	0	0	14	4
Brachionus Caudatus	2	0	0	0	7	0	32
Brachionus Quadridentatus	0	0	0	0	0	0	0
Cephalodella Sp.	0	0	0	0	0	0	0
Collotheca Sp.	2	0	2	0	5	4	0
Conochiloides Sp.	2	0	0	0	0	0	0
Conochilus Hippocrepis	0	0	0	0	0	0	0
Conochilus Unicornis	18	0	0	0	0	0	75
Contracted Rotifera	0	0	0	0	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0
Filinia Longiseta	0	0	0	0	0	0	0
Gastropus Sp.	0	0	0	0	0	0	0
Hexarthra Intermedia	2	0	0	0	0	0	0
Hexarthra Mira	0	0	0	0	0	0	0
Kellicottia Bostoniensis	0	2	0	0	0	4	0
Kellicottia Longispina	0	0	0	0	0	0	0
Keratella Sp.	207	282	281	2203	3432	1405	2218
Lecane Sp.	0	0	0	0	0	0	0
Monostyla Sp.	2	0	0	0	0	0	0
Platyias Patulus	0	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	35	37

Appendix 5-I. (Continued)

	Nov 1984						
	Tennessee River Mile						
	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Ploesoma Truncata	25	3	1	77	45	10	214
Polyarthra Sp.	2	4	23	169	1118	198	801
Rotaria Sp.	0	0	0	0	0	0	0
Synchaeta Sp.	53	16	0	100	65	5	481
Trichocerca Sp.	7	0	0	0	5	0	0
Trichotria Sp.	0	0	0	0	0	0	0
Total	369	319	308	2554	4691	1675	4154

Appendix 5-I. (Continued)

	Feb 1985							May 1985						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4*	528.0*	529.5	532.1	496.5	506.6	518.0	527.4	528.0*	529.5	532.1
Cladocera														
Alona Rectangula	0	0	0			0	0	0	0	0	0		0	0
Bosmina Longirostris	349	899	1313			156	1240	1387	2308	1123	1063		1390	137
Camptocercus Rectirostris	1	0	0			0	0	0	0	0	0		0	0
Ceriodaphnia Lacustris	0	0	0			0	0	2	1	0	0		0	0
Chydorus Sp.	9	1	3			49	65	1	157	2	0		267	0
Daphnia Galeata	0	0	0			0	0	0	1	0	0		0	0
Daphnia Imm.	14	1	0			0	0	70	73	0	0		0	0
Daphnia Parvula	0	21	0			0	17	137	73	1	0		0	150
Daphnia Pulex	7	0	0			0	31	0	0	0	0		0	0
Daphnia Retrocurva	12	209	1			92	158	891	1249	2105	5687		5187	9933
Diaphanosoma Leuchtenbergianum	0	0	1			13	34	8227	1514	11	6770		4500	9993
Holopedium Gibberum	0	0	0			1	0	0	0	0	0		0	0
Ilyocryptus Imm.	0	0	0			0	0	0	0	0	0		0	0
Ilyocryptus Spinifer	0	0	0			0	0	0	0	1	0		0	0
Leptodora Kindtii	0	0	0			0	1	340	6	15	11		147	152
Leydigia Quadrangularis	0	0	0			0	62	0	0	0	0		0	0
Moina Imm.	0	0	0			0	0	0	0	0	0		0	0
Moina Micrura	0	0	0			0	0	0	0	0	0		0	0
Moina Minuta	0	0	0			0	0	0	0	0	0		0	0
Pleuroxus Denticulatus	1	1	0			36	18	1	0	0	0		0	0
Scapholebris Kingi	0	0	0			0	0	1	0	0	0		0	0
Sida Crystallina	0	0	0			0	31	3	1	0	0		0	0
Simocephalus Serrulatus	1	1	1			0	31	2	1	84	0		0	0
Total	394	1133	1319			347	1688	11062	5384	3342	13531		11491	20365

Appendix 5-I. (Continued)

	Feb 1985							May 1985						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4*	528.0*	529.5	532.1	496.5	506.6	518.0	527.4	528.0*	529.5	532.1
Copepoda														
Calanoid Imm.	46	70	29			116	389	363	417	472	1630		1767	2237
Canthocamptus Robertcokeri	0	0	0			1	19	0	0	0	0		0	0
Cyclopoid Imm.	186	341	329			314	214	1643	2021	4847	4540		6180	13380
Cyclops Bicuspidatus Thomasi	15	41	15			58	1	157	251	332	1300		831	1484
Cyclops Vernalis	33	49	73			41	197	434	518	632	851		4687	3473
Diaptomus Birgeri	0	0	0			0	0	2	0	0	0		0	0
Diaptomus Mississippiensis	0	0	0			0	0	1	92	84	1		0	0
Diaptomus Pallidus	20	24	1			36	131	143	228	304	643		5	977
Diaptomus Reighardi	1	43	1			41	127	83	238	441	1280		1530	1000
Diaptomus Sanguineus	0	0	0			0	0	0	0	0	0		1	0
Ergasilus Sp.	0	0	0			23	0	0	0	0	0		1	3
Eucyclops Agilis	1	1	30			0	18	1	0	84	2		0	130
Eucyclops Speratus	0	1	0			0	1	0	1	0	0		0	0
Harpacticoid Imm.	0	0	0			0	1	1	0	0	0		0	0
Mesocyclops Edax	1	0	1			27	35	633	345	971	2523		5480	7193
Nauplii	10617	3783	2879			3976	3457	28027	14372	18459	25300		36960	42563
Tropocyclops Prasinus	1	1	1			41	2	88	146	4	2		0	1
Total	10921	4354	3359			4674	4592	31576	18629	26630	38072		57442	72441
Rotifera														
Asplanchna Sp.	203	62	197			203	212	8470	1646	688	0		0	137
Brachionus Angularis	97	223	205			443	48	76373	911	655	493		940	10420
Brachionus Bennini	0	21	0			0	0	0	0	0	0		0	0
Brachionus Bidentata	0	0	0			0	0	87	0	0	0		0	0
Brachionus Budapestinensis	19	33	14			35	18	115077	167	0	0		0	0
Brachionus Calyciflorus	98	63	205			54	243	4697	73	712	0		0	150

Appendix 5-I. (Continued)

	Feb 1985							May 1985						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4*	528.0*	529.5	532.1	496.5	506.6	518.0	527.4	528.0*	529.5	532.1
Brachionus Caudatus	0	21	0			54	17	3693	177	1019	0		0	137
Brachionus Havanaensis	0	0	0			0	0	0	0	0	0		0	0
Brachionus Quadridentatus	0	0	0			0	0	170	161	84	0		0	0
Brachionus Urceolaris	0	0	0			0	0	137	161	84	0		0	0
Cephalodella Sp.	0	0	0			0	0	0	0	0	0		0	0
Collotheca Sp.	19	32	59			0	0	327	177	308	0		27	0
Conochiloides Sp.	0	0	532			0	17	0	0	168	0		0	0
Conochilus Unicornis	0	0	43			0	0	0	388	505	0		0	0
Contracted Rotifera	12	0	14			13	0	0	0	0	0		0	0
Dipleuchlanis Sp.	0	0	0			0	0	27	0	0	0		0	0
Epiphanes Macrourus	0	0	0			0	0	0	0	0	0		0	280
Euchlanis Sp.	0	0	0			0	17	0	0	0	0		0	0
Filinia Longiseta	0	66	129			22	49	70	89	0	0		27	0
Hexarthra Intermedia	14	0	14			0	0	0	0	0	980		13	0
Hexarthra Mira	0	0	0			0	0	0	0	0	0		0	2473
Kellicottia Bostoniensis	14	75	15			21	53	90	3365	0	0		0	0
Kellicottia Longispina	175	0	27			62	92	0	34189	48719	371630		305613	160153
Keratella Sp.	4177	5044	3923			3607	5853	12913	6989	5635	16380		33173	23577
Lecane Sp.	0	0	0			0	0	137	0	0	0		0	0
Monostyla Sp.	0	0	0			0	0	70	0	0	0		0	0
Platyias Patulus	0	0	0			0	0	0	0	0	0		0	0
Ploesoma Hudsoni	0	0	0			0	0	0	0	0	3		0	0
Ploesoma Truncata	0	42	0			0	0	787	167	0	0		690	0
Polyarthra Sp.	3938	6249	5241			3694	2162	6723	49781	17902	101200		127210	56233
Synchaeta Sp.	10696	20670	20300			6794	6598	41020	30609	15509	4873		38073	19703
Trichocerca Sp.	0	21	15			22	18	7550	0	0	2117		4513	2873
Trichotria Sp.	39	13	0			0	0	0	0	0	997		0	1860
Total	19501	32635	30933			15024	15397	278418	129050	91988	498673		510279	277996

Appendix 5-I. (Continued)

	Aug 1985							Nov 1985						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Cladocera														
Alona Rectangula	65	0	0	0	0	0	0	5	0	0	0	0	0	82
Bosmina Longirostris	19219	6697	10516	4026	11283	22092	7297	1428	1358	466	2925	3037	4641	3882
Camptocercus Rectirostris	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Ceriodaphnia Lacustris	325	263	308	200	4	6	280	0	0	2	111	301	14	446
Chydorus Sp.	0	0	1	0	0	0	0	15	0	0	0	0	0	0
Daphnia Galeata	0	0	0	0	0	0	0	0	0	0	0	78	0	0
Daphnia Imm.	0	0	0	0	0	0	50	0	9	0	3	138	0	297
Daphnia Parvula	0	21	0	382	109	0	34	6	7	18	96	0	98	223
Daphnia Pulex	0	0	0	51	0	0	0	0	0	0	0	0	0	0
Daphnia Retrocurva	350	52	71	416	1085	1982	2903	129	110	221	1449	2875	3853	4846
Diaphanosoma Leuchtenbergianum	6113	4297	3251	14094	15859	36016	20820	0	7	18	1709	2519	3186	7947
Holopedium Gibberum	0	0	0	0	0	0	0	0	1	0	3	0	0	36
Ilyocryptus Imm.	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Ilyocryptus Spinifer	130	13	22	0	0	3	0	0	19	1	0	0	0	2
Leptodora Kindtii	16	5	4	121	576	11	208	0	3	0	60	12	5	7
Leydigia Quadrangularis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moina Imm.	0	0	0	28	0	0	0	0	0	0	0	0	0	0
Moina Micrura	129	0	0	108	1	0	1	0	0	0	0	1	0	0
Moina Minuta	1	0	0	0	36	0	0	0	0	0	0	0	0	0
Pleuroxus Denticulatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scapholebris Kingi	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sida Crystallina	2	13	21	6	79	0	0	0	0	29	5	0	0	2
Simocephalus Serrulatus	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total	26351	11364	14194	19433	29032	60110	31593	1583	1514	755	6361	8961	11797	17770

Appendix 5-I. (Continued)

	Aug 1985							Nov 1985						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Copepoda														
Calanoid Imm.	591	553	935	595	921	1547	828	82	130	38	1155	1492	2569	2235
Canthocamptus Robertcokeri	0	0	0	0	0	0	0	0	0	3	0	39	1	2
Cyclopoid Imm.	2691	2160	1640	2773	2944	2382	4033	568	1038	774	5707	2625	12824	14521
Cyclops Bicuspidatus Thomasi	130	32	0	42	0	0	0	15	70	150	227	117	493	314
Cyclops Vernalis	692	397	132	1394	767	1546	2411	148	219	260	2023	1768	3490	2276
Diaptomus Birgeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaptomus Mississippiensis	1	43	4	172	72	161	277	7	0	13	5	1	4	1
Diaptomus Pallidus	359	47	77	121	186	474	377	25	55	17	301	241	248	185
Diaptomus Reighardi	384	46	150	331	149	437	365	54	41	30	352	288	209	437
Diaptomus Sanguineus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ergasilus Sp.	2	79	2	172	4	9	81	1	1	1	4	4	5	2
Eucyclops Agilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucyclops Speratus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Harpacticoid Imm.	0	0	0	0	0	0	0	1	0	0	1	0	0	83
Mesocyclops Edax	514	321	77	1391	2419	2468	8404	43	199	278	1022	491	2131	1908
Nauplii	13476	8521	12387	36070	42214	71063	42977	1476	1431	1575	12184	12305	32578	40903
Tropocyclops Prasinus	2	1	1	28	0	346	71	1	9	0	1	41	0	71
Total	18842	12200	15405	43089	49676	80433	59824	2421	3193	3139	22982	19412	54552	62938
Rotifera														
Asplanchna Sp.	301	225	749	367	665	731	1255	84	23	0	0	0	149	152
Brachionus Angularis	6866	914	1125	2407	1522	2402	6367	9	0	111	0	204	74	223
Brachionus Bennini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Bidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Budapestinensis	6334	349	1003	1320	1009	684	914	5	0	0	0	0	74	33
Brachionus Calyciflorus	366	0	0	57	83	85	69	43	0	0	0	0	0	0

Appendix 5-I. (Continued)

	Aug 1985							Nov 1985						
	Tennessee River Mile													
	496.5	506.6	518.0	527.4	528.0	529.5	532.1	496.5	506.6	518.0	527.4	528.0	529.5	532.1
Brachionus Caudatus	1159	0	103	0	71	256	1553	14	0	0	0	0	0	0
Brachionus Havanaensis	242	0	34	0	0	0	0	0	0	0	0	0	74	0
Brachionus Quadridentatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachionus Urceolaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalodella Sp.	0	0	21	0	0	0	0	0	0	25	0	0	0	0
Collotheca Sp.	0	23	0	57	113	361	254	30	7	114	256	64	0	215
Conochiloides Sp.	687	199	117	0	0	247	0	4	0	0	0	0	0	0
Conochilus Unicornis	41630	33	0	51	0	266	309	180	0	0	0	0	0	82
Contracted Rotifera	1	11	21	0	0	0	85	0	0	0	0	46	0	82
Dipleuchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Epiphanes Macrourus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euchlanis Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Filinia Longiseta	169	21	21	1	72	77	323	0	7	22	0	0	0	0
Hexarthra Intermedia	1273	0	232	153	0	0	115	0	0	0	0	0	0	103
Hexarthra Mira	0	42	0	57	0	0	0	0	0	0	0	0	0	0
Kellicottia Bostoniensis	128	85	21	164	149	161	153	6	14	0	0	0	74	115
Kellicottia Longispina	113	348	104	51	149	0	185	0	0	0	0	0	0	0
Keratella Sp.	1814	395	1575	6493	8802	13235	10203	2007	2224	6334	46192	33107	56515	69531
Lecane Sp.	193	0	0	176	1	0	50	0	0	0	44	78	0	0
Monostyla Sp.	0	0	0	0	0	0	0	20	0	0	0	0	76	0
Platyias Patulus	65	11	21	0	44	0	161	5	0	0	0	0	0	0
Ploesoma Hudsoni	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ploesoma Truncata	1756	504	762	1904	2269	3550	4494	28	0	0	0	0	0	140
Polyarthra Sp.	4612	1425	3587	2930	3242	20232	10100	115	242	140	1942	1151	615	3468
Synchaeta Sp.	1707	35	273	57	0	0	312	962	0	110	89	296	0	486
Trichocerca Sp.	775	361	829	200	478	3179	1619	86	9	812	3677	5434	6201	17856
Trichotria Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	70191	4981	10598	16445	18669	45466	38521	3598	2526	7668	52200	40380	63852	92486

*No sample taken or sample not acceptable due to malfunctioning equipment or mishandling.

APPENDIX 5-J

ZOOPLANKTON DIVERSITY INDEX VALUES
DURING PREOPERATIONAL MONITORING PERIODS,
WATTS BAR NUCLEAR PLANT

Appendix 5-J. Zooplankton Diversity Index Values During Preoperational Monitoring Periods, Watts Bar Nuclear Plant

	Tennessee River Mile													
	496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar
Feb 1973	12	0.34	15	1.58	17	1.32	15	1.67	16	1.83	14	1.79	15	1.99
May 1973	27	2.17	25	0.96	22	1.87	21	2.08	26	2.14	23	2.17	27	2.38
Aug 1973	24	2.59	31	2.64	25	2.85	32	2.77	26	2.83	24	3.36	31	3.31
Nov 1973	25	2.45	20	1.90	23	2.20	21	2.03	23	2.19	22	2.41	28	2.54
Feb 1974	20	2.21	24	2.29	21	2.29	19	2.43	25	2.29	20	2.12	26	2.07
May 1974	39	2.42	19	1.10	18	1.83	22	1.73	22	1.68	20	1.41	21	2.12
Aug 1974	23	3.11	14	2.65	20	2.63	18	3.05	20	2.96	18	3.06	24	3.00
Nov 1974	22	2.44	18	1.81	19	1.73	24	1.79	24	1.68	29	2.15	24	2.31
Feb 1975	22	2.16	21	2.10	17	1.89	17	2.25	15	2.28	21	2.19	21	2.16
May 1975	29	1.46	29	1.47	28	1.47	28	1.23	24	2.79	26	1.36	26	1.80
Aug 1975	34	3.61	24	2.85	26	2.97	28	3.09	27	3.04	26	2.85	26	2.82
Nov 1975	35	3.25	23	2.44	20	2.29	27	2.47	26	2.53	23	2.39	26	2.17

Appendix 5-J. (Continued)

Date	Tennessee River Mile 496.5 No. Taxa	DBar	506.6 No. Taxa	DBar	518.0 No. Taxa	DBar	527.4 No. Taxa	DBar	528.0 No. Taxa	DBar	529.5 No. Taxa	DBar	532.1 No. Taxa	DBar
Feb 1976	21	1.52	*		*		*		*		*		*	
May 1976	33	1.89	26	0.89	23	2.06	25	1.79	24	1.85	26	1.87	31	2.40
Aug 1976	33	3.49	24	2.79	28	2.75	31	2.55	28	2.23	27	2.72	26	3.10
Nov 1976	28	2.06	22	1.90	24	2.03	23	1.85	29	1.85	32	2.14	32	2.01
Feb 1977	17	1.75	19	1.67	20	1.75	21	1.69	18	1.68	19	1.71	22	1.73
May 1977	35	2.80	29	2.40	26	2.90	27	2.99	25	3.06	24	2.84	28	3.18
Aug 1977	33	3.07	26	3.26	30	2.99	26	3.24	30	3.32	28	3.07	29	2.63
Nov 1977	31	2.00	22	1.56	27	1.78	23	1.85	29	1.58	25	2.75	27	2.42
May 1982	28	2.30	19	0.84	22	1.87	19	2.44	16	2.30	23	2.81	23	2.60
Aug 1982	37	3.23	39	3.01	35	2.90	37	3.00	31	3.23	30	2.94	34	3.22
Nov 1982	21	1.18	18	0.87	25	2.28	27	2.40	25	2.46	28	2.52	27	2.55

Appendix 5-J. (Continued)

	Tennessee River Mile													
	496.5		506.6		518.0		527.4		528.0		529.5		532.1	
Date	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar	No. Taxa	DBar
Feb 1983	18	1.28	15	0.98	21	0.61	19	1.32	23	1.23	23	1.29	20	1.33
Jun 1983	33	2.57	29	2.51	33	3.04	30	2.27	28	2.74	31	2.44	37	2.69
Aug 1983	28	3.05	19	2.23	32	3.22	22	3.57	24	3.60	21	3.60	18	3.36
Nov 1983	21	0.71	16	0.68	25	1.62	29	2.20	31	2.32	35	2.54	35	2.62
Feb 1984	30	2.10	23	1.78	25	1.91	24	1.73	20	1.85	20	1.81	27	1.94
May 1984	34	2.60	28	2.00	23	1.83	28	2.03	30	2.02	29	2.01	33	1.87
Aug 1984	34	3.50	29	3.02	32	3.43	35	3.12	29	3.53	33	3.52	33	3.58
Nov 1984	28	1.74	20	0.77	19	0.90	20	1.17	24	1.21	23	1.12	25	1.42
Feb 1985	27	1.83	28	1.70	28	1.77	*		*		27	2.20	34	2.44
May 1985	39	2.56	34	2.47	29	2.35	21	1.38	*		22	1.88	25	2.44
Aug 1985	39	2.93	35	2.95	33	2.96	34	3.22	30	3.02	27	2.86	33	3.50
Nov 1985	29	2.68	21	2.21	23	1.92	22	1.66	24	2.07	23	1.83	32	2.11

*No sample taken or sample not acceptable due to malfunctioning equipment or mishandling.

APPENDIX 5-K

SIMILARITY OF ZOOPLANKTON COMMUNITY STRUCTURE DURING PREOPERATIONAL MONITORING BASED ON SORENSEN'S QUOTIENT OF SIMILARITY AND PERCENT SIMILARITY INDEX, WATTS BAR NUCLEAR PLANT

Appendix 5-K. Similarity of Zooplankton Community Structure during Preoperational Monitoring Based on Sorensen's Quotient of Similarity and Percent Similarity Index, Watts Bar Nuclear Plant

SORENSENS QUOTIENT OF SIMILARITY MATRIX

FEB 1973

	1	2	3	4	5	6	7
1	100.00						
2	66.67	100.00					
3	72.22	82.05	100.00				
4	76.47	75.68	80.00	100.00			
5	74.29	73.68	87.80	76.92	100.00		
6	77.42	76.47	75.68	74.29	77.78	100.00	
7	72.73	83.33	87.18	81.08	84.21	82.35	100.00

MAY 1983

	1	2	3	4	5	6	7
1	100.00						
2	83.87	100.00					
3	89.66	89.29	100.00				
4	87.72	83.64	94.12	100.00			
5	87.10	76.67	85.71	87.27	100.00		
6	91.53	84.21	94.34	92.31	91.23	100.00	
7	88.89	81.97	91.23	85.71	88.52	93.10	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

AUG 1973

	1	2	3	4	5	6	7
1	100.00						
2	77.61	100.00					
3	80.00	75.36	100.00				
4	81.82	77.33	88.24	100.00			
5	81.97	80.00	88.89	89.86	100.00		
6	81.36	76.47	91.80	83.58	93.55	100.00	
7	75.76	85.33	85.29	83.78	86.96	89.55	100.00

NOV 1973

	1	2	3	4	5	6	7
1	100.00						
2	71.70	100.00					
3	77.19	84.62	100.00				
4	72.73	84.00	85.19	100.00			
5	73.68	80.77	82.14	88.89	100.00		
6	72.73	88.00	85.19	88.46	85.19	100.00	
7	72.13	78.57	76.67	82.76	86.67	82.76	100.00

FEB 1974

	1	2	3	4	5	6	7
1	100.00						
2	83.02	100.00					
3	88.00	83.02	100.00				
4	83.33	74.51	83.33	100.00			
5	77.78	84.21	77.78	76.92	100.00		
6	85.71	80.77	81.63	89.36	86.79	100.00	
7	80.00	82.76	76.36	83.02	81.36	81.48	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

MAY 1974

	1	2	3	4	5	6	7
1	100.00						
2	62.69	100.00					
3	55.38	81.82	100.00				
4	62.86	89.80	85.11	100.00			
5	62.86	81.63	80.85	84.62	100.00		
6	61.76	85.11	84.44	92.00	84.00	100.00	
7	60.87	87.50	82.61	90.20	90.20	89.80	100.00

AUG 1974

	1	2	3	4	5	6	7
1	100.00						
2	65.12	100.00					
3	77.55	75.00	100.00				
4	68.09	73.68	81.82	100.00			
5	72.00	73.17	80.85	80.00	100.00		
6	70.83	82.05	84.44	79.07	86.96	100.00	
7	77.78	66.67	74.51	73.47	80.77	80.00	100.00

NOV 1974

	1	2	3	4	5	6	7
1	100.00						
2	69.57	100.00					
3	76.60	78.05	100.00				
4	67.92	68.09	70.83	100.00			
5	67.92	72.34	70.83	88.89	100.00		
6	75.86	65.38	75.47	77.97	84.75	100.00	
7	81.48	66.67	73.47	72.73	76.36	83.33	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

FEB 1975

	1	2	3	4	5	6	7
1	100.00						
2	81.63	100.00					
3	80.00	86.36	100.00				
4	75.56	86.36	85.00	100.00			
5	65.12	71.43	73.68	78.95	100.00		
6	73.47	79.17	81.82	86.36	66.67	100.00	
7	73.47	83.33	77.27	77.27	71.43	83.33	100.00

MAY 1975

	1	2	3	4	5	6	7
1	100.00						
2	80.60	100.00					
3	75.00	77.61	100.00				
4	78.13	74.63	81.25	100.00			
5	80.00	79.37	86.67	90.00	100.00		
6	77.42	83.08	87.10	80.65	86.21	100.00	
7	80.65	80.00	80.65	83.87	89.66	80.00	100.00

AUG 1975

	1	2	3	4	5	6	7
1	100.00						
2	73.53	100.00					
3	78.26	84.75	100.00				
4	80.56	87.10	85.71	100.00			
5	76.06	85.25	83.87	89.23	100.00		
6	74.29	80.00	81.97	90.63	88.89	100.00	
7	81.16	84.75	83.33	95.24	90.32	88.52	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

NOV 1975

	1	2	3	4	5	6	7
1	100.00						
2	70.59	100.00					
3	71.88	81.48	100.00				
4	76.06	81.97	87.72	100.00			
5	74.29	83.33	85.71	88.89	100.00		
6	73.53	82.76	88.89	88.52	93.33	100.00	
7	67.61	81.97	80.70	81.25	88.89	91.80	100.00

FEB 1976*

	1
1	100.00

MAY 1976

	1	2	3	4	5	6	7
1	100.00						
2	81.16	100.00					
3	76.92	75.86	100.00				
4	80.60	83.33	89.29	100.00			
5	77.61	83.33	85.71	86.21	100.00		
6	73.53	75.41	80.70	81.36	84.75	100.00	
7	76.71	69.70	74.19	78.13	75.00	80.00	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

AUG 1976

	1	2	3	4	5	6	7
1	100.00						
2	81.25	100.00					
3	80.00	86.67	100.00				
4	82.19	82.54	86.96	100.00			
5	82.86	83.33	84.85	86.96	100.00		
6	85.29	86.21	87.50	80.60	84.38	100.00	
7	83.58	87.72	92.06	84.85	88.89	88.52	100.00

NOV 1976

	1	2	3	4	5	6	7
1	100.00						
2	61.02	100.00					
3	66.67	73.68	100.00				
4	64.41	71.43	87.72	100.00			
5	69.70	69.84	81.25	85.71	100.00		
6	63.77	69.70	83.58	84.85	79.45	100.00	
7	67.65	67.69	84.85	83.08	80.56	85.33	100.00

FEB 1977

	1	2	3	4	5	6	7
1	100.00						
2	65.12	100.00					
3	54.55	76.60	100.00				
4	53.33	75.00	77.55	100.00			
5	55.81	73.91	76.60	87.50	100.00		
6	55.81	69.57	76.60	87.50	86.96	100.00	
7	56.52	77.55	68.00	74.51	77.55	77.55	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

MAY 1977

	1	2	3	4	5	6	7
1	100.00						
2	75.68	100.00					
3	68.57	87.10	100.00				
4	77.78	87.50	86.67	100.00			
5	71.43	87.10	93.10	90.00	100.00		
6	75.36	85.25	87.72	91.53	91.23	100.00	
7	71.23	86.15	81.97	88.89	85.25	90.00	100.00

AUG 1977

	1	2	3	4	5	6	7
1	100.00						
2	84.06	100.00					
3	76.71	81.82	100.00				
4	84.06	87.10	87.88	100.00			
5	79.45	84.85	91.43	90.91	100.00		
6	78.87	81.25	88.24	90.63	85.29	100.00	
7	77.78	83.08	89.86	86.15	86.96	89.55	100.00

NOV 1977

	1	2	3	4	5	6	7
1	100.00						
2	75.41	100.00					
3	74.63	90.00	100.00				
4	75.41	85.19	80.00	100.00			
5	76.47	85.25	83.58	81.97	100.00		
6	79.37	85.71	80.65	85.71	85.71	100.00	
7	72.73	71.19	67.69	71.19	78.79	75.41	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

MAY 1982

	1	2	3	4	5	6	7
1	100.00						
2	77.78	100.00					
3	82.14	79.17	100.00				
4	75.47	84.44	80.85	100.00			
5	74.51	79.07	75.56	71.43	100.00		
6	80.70	85.71	78.43	83.33	73.91	100.00	
7	77.19	77.55	74.51	79.17	78.26	88.46	100.00

AUG 1982

	1	2	3	4	5	6	7
1	100.00						
2	85.71	100.00					
3	80.95	74.42	100.00				
4	80.95	76.74	81.40	100.00			
5	86.84	82.05	79.49	84.62	100.00		
6	76.32	71.79	84.62	76.92	85.71	100.00	
7	85.00	82.93	85.37	92.68	86.49	78.38	100.00

NOV 1982

	1	2	3	4	5	6	7
1	100.00						
2	73.91	100.00					
3	65.38	64.00	100.00				
4	66.67	73.08	75.86	100.00			
5	60.38	66.67	66.67	74.58	100.00		
6	65.45	67.92	77.97	81.97	80.00	100.00	
7	70.37	65.38	79.31	83.33	74.58	88.52	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

FEB 1983

	1	2	3	4	5	6	7
1	100.00						
2	58.54	100.00					
3	66.67	68.18	100.00				
4	68.18	79.07	76.60	100.00			
5	59.57	69.57	68.00	69.39	100.00		
6	66.67	59.57	58.82	64.00	67.92	100.00	
7	66.67	59.09	62.50	51.06	60.00	62.75	100.00

JUN 1983

	1	2	3	4	5	6	7
1	100.00						
2	80.00	100.00					
3	72.97	80.00	100.00				
4	76.06	83.58	81.69	100.00			
5	81.16	86.15	78.26	81.82	100.00		
6	79.45	81.16	76.71	77.14	82.35	100.00	
7	71.79	78.38	74.36	74.67	76.71	75.32	100.00

AUG 1983

	1	2	3	4	5	6	7
1	100.00						
2	69.09	100.00					
3	74.63	66.67	100.00				
4	71.43	77.55	68.85	100.00			
5	65.52	78.43	69.84	84.62	100.00		
6	71.43	81.63	65.57	88.00	73.08	100.00	
7	73.08	75.56	63.16	73.91	75.00	73.91	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

NOV 1983

	1	2	3	4	5	6	7
1	100.00						
2	77.27	100.00					
3	74.07	75.00	100.00				
4	77.97	67.92	76.19	100.00			
5	75.41	65.45	76.92	80.00	100.00		
6	67.69	64.41	72.46	78.38	78.95	100.00	
7	67.69	57.63	69.57	72.97	78.95	82.50	100.00

FEB 1984

	1	2	3	4	5	6	7
1	100.00						
2	78.69	100.00					
3	75.00	80.00	100.00				
4	73.02	66.67	63.16	100.00			
5	65.52	73.47	61.54	70.59	100.00		
6	55.17	61.22	61.54	62.75	73.91	100.00	
7	72.73	63.16	73.33	67.80	66.67	62.96	100.00

MAY 1984

	1	2	3	4	5	6	7
1	100.00						
2	88.24	100.00					
3	76.19	84.21	100.00				
4	81.16	82.54	68.97	100.00			
5	78.26	79.37	82.76	78.13	100.00		
6	74.29	75.00	71.19	83.08	73.85	100.00	
7	78.38	85.29	79.37	84.06	84.06	80.00	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

AUG 1984

	1	2	3	4	5	6	7
1	100.00						
2	83.33	100.00					
3	80.00	87.32	100.00				
4	82.05	81.08	88.31	100.00			
5	77.78	85.29	81.69	81.08	100.00		
6	80.00	84.51	86.49	85.71	84.51	100.00	
7	77.33	81.69	78.38	77.92	87.32	83.78	100.00

NOV 1984

	1	2	3	4	5	6	7
1	100.00						
2	70.37	100.00					
3	61.82	72.34	100.00				
4	66.67	78.26	72.34	100.00			
5	67.80	66.67	76.92	78.43	100.00		
6	61.02	70.59	73.08	70.59	71.43	100.00	
7	70.00	69.23	71.70	69.23	73.68	73.68	100.00

FEB 1985*

	1	2	3	6	7
1	100.00				
2	79.37	100.00			
3	83.87	76.19	100.00		
6	75.41	74.19	81.97	100.00	
7	72.46	77.14	78.26	79.41	100.00

Appendix 5-K. (Continued)

SORENSENS QUOTIENT OF SIMILARITY MATRIX

MAY 1985*

	1	2	3	4	6	7
1	100.00					
2	82.93	100.00				
3	73.68	82.86	100.00			
4	58.82	61.29	71.43	100.00		
6	60.87	66.67	66.67	77.55	100.00	
7	63.89	66.67	76.67	80.77	71.70	100.00

AUG 1985

	1	2	3	4	5	6	7
1	100.00						
2	83.95	100.00					
3	87.18	82.67	100.00				
4	81.48	84.62	74.67	100.00			
5	82.67	77.78	78.26	83.33	100.00		
6	80.56	81.16	81.82	78.26	82.54	100.00	
7	86.08	81.58	82.19	86.84	88.57	83.58	100.00

NOV 1985

	1	2	3	4	5	6	7
1	100.00						
2	65.52	100.00					
3	64.41	74.51	100.00				
4	66.67	80.77	79.25	100.00			
5	62.30	71.70	77.78	83.64	100.00		
6	71.19	74.51	76.92	71.70	74.07	100.00	
7	77.14	77.42	76.19	81.25	76.92	76.19	100.00

Appendix 5–K. (Continued.)

PERCENT SIMILARITY MATRIX

FEB 1973

	1	2	3	4	5	6	7
1	100.00						
2	35.18	100.00					
3	51.77	73.01	100.00				
4	47.17	57.08	79.62	100.00			
5	37.45	68.62	70.96	82.28	100.00		
6	29.96	85.11	67.12	53.54	64.69	100.00	
7	28.85	74.13	63.60	67.26	77.65	77.87	100.00

MAY 1973

	1	2	3	4	5	6	7
1	100.00						
2	62.44	100.00					
3	64.50	79.28	100.00				
4	56.61	62.80	77.75	100.00			
5	35.69	40.54	54.92	67.59	100.00		
6	43.24	49.37	65.91	71.33	82.85	100.00	
7	32.09	33.16	45.83	53.94	77.83	74.42	100.00

AUG 1973

	1	2	3	4	5	6	7
1	100.00						
2	67.57	100.00					
3	38.59	47.57	100.00				
4	32.44	40.53	85.91	100.00			
5	20.09	31.62	62.13	72.52	100.00		
6	13.88	24.00	46.58	50.08	63.05	100.00	
7	10.99	19.26	38.39	45.86	60.08	81.55	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

NOV 1973

	1	2	3	4	5	6	7
1	100.00						
2	78.80	100.00					
3	67.98	79.82	100.00				
4	39.30	44.72	54.70	100.00			
5	25.10	27.71	37.60	71.33	100.00		
6	16.86	18.83	26.00	52.28	73.78	100.00	
7	9.55	10.16	14.29	30.58	48.93	65.76	100.00

FEB 1974

	1	2	3	4	5	6	7
1	100.00						
2	87.22	100.00					
3	77.46	79.46	100.00				
4	87.56	87.58	69.90	100.00			
5	83.80	93.35	83.74	83.19	100.00		
6	84.02	86.63	87.19	76.28	91.45	100.00	
7	90.76	87.20	75.62	86.74	86.53	82.85	100.00

MAY 1974

	1	2	3	4	5	6	7
1	100.00						
2	50.16	100.00					
3	25.15	47.30	100.00				
4	56.35	66.10	32.32	100.00			
5	40.81	40.12	16.84	64.08	100.00		
6	41.68	54.64	24.93	77.47	77.37	100.00	
7	43.46	30.56	12.64	51.47	81.82	63.36	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

AUG 1974

	1	2	3	4	5	6	7
1	100.00						
2	57.79	100.00					
3	54.04	55.47	100.00				
4	45.06	47.62	62.46	100.00			
5	33.58	36.80	53.79	77.52	100.00		
6	36.45	41.07	55.81	83.15	78.71	100.00	
7	16.96	14.41	24.87	44.24	53.41	50.55	100.00

NOV 1974

	1	2	3	4	5	6	7
1	100.00						
2	72.12	100.00					
3	60.84	69.75	100.00				
4	42.88	43.59	60.90	100.00			
5	39.08	36.03	46.84	82.00	100.00		
6	24.09	19.36	29.37	54.49	64.86	100.00	
7	18.02	14.13	22.00	42.37	51.25	82.87	100.00

FEB 1975

	1	2	3	4	5	6	7
1	100.00						
2	75.40	100.00					
3	64.41	86.51	100.00				
4	85.54	78.66	68.75	100.00			
5	58.16	74.50	72.38	66.11	100.00		
6	66.05	80.30	80.58	74.99	84.49	100.00	
7	73.94	73.88	66.73	82.21	80.97	81.37	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

MAY 1975

	1	2	3	4	5	6	7
1	100.00						
2	63.43	100.00					
3	81.54	74.51	100.00				
4	74.44	52.62	71.62	100.00			
5	36.26	51.02	47.33	45.40	100.00		
6	78.01	63.03	83.75	78.21	56.92	100.00	
7	66.05	44.46	62.78	76.30	43.93	75.56	100.00

AUG 1975

	1	2	3	4	5	6	7
1	100.00						
2	60.90	100.00					
3	64.55	73.93	100.00				
4	29.89	33.91	34.68	100.00			
5	34.60	37.91	44.03	75.25	100.00		
6	28.42	34.44	40.46	76.55	78.86	100.00	
7	16.75	16.79	18.05	62.30	46.74	48.84	100.00

NOV 1975

	1	2	3	4	5	6	7
1	100.00						
2	47.04	100.00					
3	51.13	69.01	100.00				
4	34.53	20.61	34.42	100.00			
5	26.34	15.50	26.95	82.27	100.00		
6	21.07	11.95	21.10	66.94	81.53	100.00	
7	17.77	9.35	16.02	59.52	70.01	78.44	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

FEB 1976*

	1
	100.00

MAY 1976

	1	2	3	4	5	6	7
1	100.00						
2	73.47	100.00					
3	73.41	59.86	100.00				
4	64.17	66.97	66.97	100.00			
5	66.16	68.99	68.34	93.80	100.00		
6	51.94	53.97	54.23	82.56	81.65	100.00	
7	38.41	29.55	48.38	57.31	57.74	59.91	100.00

AUG 1976

	1	2	3	4	5	6	7
1	100.00						
2	67.85	100.00					
3	36.86	52.92	100.00				
4	18.78	27.05	58.90	100.00			
5	22.37	32.10	68.30	85.84	100.00		
6	41.98	61.91	74.92	42.90	51.86	100.00	
7	24.18	33.20	70.22	70.61	70.43	55.73	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

NOV 1976

	1	2	3	4	5	6	7
1	100.00						
2	80.84	100.00					
3	43.76	53.02	100.00				
4	30.58	37.29	73.52	100.00			
5	32.26	39.32	72.73	94.77	100.00		
6	26.31	32.52	69.73	89.65	87.99	100.00	
7	15.39	19.02	44.20	61.35	58.77	67.80	100.00

FEB 1977

	1	2	3	4	5	6	7
1	100.00						
2	68.31	100.00					
3	85.85	74.92	100.00				
4	79.20	84.72	88.07	100.00			
5	74.97	88.86	82.48	92.99	100.00		
6	78.72	86.35	87.24	96.51	94.33	100.00	
7	74.44	87.31	81.87	93.25	92.86	92.66	100.00

MAY 1977

	1	2	3	4	5	6	7
1	100.00						
2	55.24	100.00					
3	71.21	61.85	100.00				
4	53.45	26.00	45.64	100.00			
5	79.93	46.77	75.33	64.50	100.00		
6	50.04	24.81	43.26	84.63	57.63	100.00	
7	46.41	21.84	39.10	83.83	56.52	80.26	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

AUG 1977

	1	2	3	4	5	6	7
1	100.00						
2	71.55	100.00					
3	69.50	87.92	100.00				
4	45.69	51.89	52.50	100.00			
5	53.72	60.23	62.56	85.54	100.00		
6	54.78	61.86	64.69	81.36	86.39	100.00	
7	25.25	27.11	28.18	57.51	49.37	45.98	100.00

NOV 1977

	1	2	3	4	5	6	7
1	100.00						
2	41.16	100.00					
3	32.22	81.85	100.00				
4	18.37	55.46	67.07	100.00			
5	17.71	52.97	66.11	90.21	100.00		
6	4.97	17.68	23.19	39.30	41.30	100.00	
7	4.04	14.47	19.13	32.52	34.37	71.56	100.00

MAY 1982

	1	2	3	4	5	6	7
1	100.00						
2	62.20	100.00					
3	70.48	69.22	100.00				
4	64.07	37.03	56.08	100.00			
5	75.32	47.41	65.00	82.32	100.00		
6	66.79	38.35	60.52	83.53	84.36	100.00	
7	75.87	59.65	76.29	69.10	73.32	73.62	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

AUG 1982

	1	2	3	4	5	6	7
1	100.00						
2	48.09	100.00					
3	73.37	57.98	100.00				
4	42.13	20.00	39.01	100.00			
5	55.77	30.22	55.73	72.62	100.00		
6	50.68	28.13	53.30	75.37	84.66	100.00	
7	55.50	28.60	52.95	73.24	86.06	85.28	100.00

NOV 1982

	1	2	3	4	5	6	7
1	100.00						
2	81.31	100.00					
3	71.98	66.96	100.00				
4	44.28	33.86	46.67	100.00			
5	29.59	22.11	30.91	72.91	100.00		
6	24.88	18.37	26.25	64.48	74.58	100.00	
7	30.47	22.75	32.09	66.46	79.23	83.60	100.00

FEB 1983

	1	2	3	4	5	6	7
1	100.00						
2	82.62	100.00					
3	87.92	81.09	100.00				
4	79.36	89.53	77.61	100.00			
5	85.68	85.95	83.82	79.92	100.00		
6	70.02	82.58	68.21	81.93	72.10	100.00	
7	86.74	84.65	81.55	82.28	92.76	75.01	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

JUN 1983

	1	2	3	4	5	6	7
1	100.00						
2	44.66	100.00					
3	7.51	22.96	100.00				
4	6.21	19.05	66.69	100.00			
5	4.67	14.72	65.10	76.00	100.00		
6	4.27	13.42	58.21	75.08	71.90	100.00	
7	8.89	26.33	67.34	67.96	59.95	55.08	100.00

AUG 1983

	1	2	3	4	5	6	7
1	100.00						
2	66.54	100.00					
3	65.00	64.83	100.00				
4	43.05	39.16	58.59	100.00			
5	46.36	40.56	62.34	79.92	100.00		
6	48.54	51.80	60.15	64.82	65.05	100.00	
7	30.65	29.82	48.64	69.07	63.36	54.06	100.00

NOV 1983

	1	2	3	4	5	6	7
1	100.00						
2	53.43	100.00					
3	74.42	49.31	100.00				
4	60.08	27.85	64.01	100.00			
5	45.91	20.26	48.39	78.45	100.00		
6	27.49	11.39	29.55	53.51	68.91	100.00	
7	51.15	36.08	68.78	74.42	59.40	42.56	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

FEB 1984

	1	2	3	4	5	6	7
1	100.00						
2	53.97	100.00					
3	87.33	59.71	100.00				
4	75.87	40.51	73.36	100.00			
5	78.04	40.49	72.40	83.96	100.00		
6	83.37	63.35	82.57	69.01	68.69	100.00	
7	69.32	33.60	63.71	86.81	85.08	60.04	100.00

MAY 1984

	1	2	3	4	5	6	7
1	100.00						
2	78.67	100.00					
3	43.56	40.15	100.00				
4	11.51	10.16	34.64	100.00			
5	13.50	11.88	39.68	86.84	100.00		
6	16.97	15.01	48.35	76.44	82.44	100.00	
7	6.41	5.60	20.24	62.26	61.20	51.28	100.00

AUG 1984

	1	2	3	4	5	6	7
1	100.00						
2	64.21	100.00					
3	58.50	59.61	100.00				
4	43.82	42.49	63.70	100.00			
5	30.23	34.02	47.49	74.78	100.00		
6	49.71	53.28	75.00	71.18	60.58	100.00	
7	31.12	32.38	46.55	65.57	68.34	60.41	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX

NOV 1984

	1	2	3	4	5	6	7
1	100.00						
2	52.71	100.00					
3	48.02	91.05	100.00				
4	19.22	41.25	45.06	100.00			
5	13.68	30.15	33.40	80.25	100.00		
6	19.48	42.68	47.80	92.39	77.39	100.00	
7	10.84	23.73	26.01	67.75	81.09	65.11	100.00

FEB 1985*

	1	2	3	6	7
1	100.00				
2	68.31	100.00			
3	67.88	92.61	100.00		
6	74.76	65.73	65.04	100.00	
7	66.81	63.78	61.90	81.94	100.00

MAY 1985*

	1	2	3	4	6	7
1	100.00					
2	29.39	100.00				
3	25.00	70.13	100.00			
4	14.83	33.71	31.82	100.00		
6	22.70	39.65	33.62	84.71	100.00	
7	27.20	50.89	47.75	63.33	69.29	100.00

Appendix 5-K. (Continued.)

PERCENT SIMILARITY MATRIX
AUG 1985

	1	2	3	4	5	6	7
1	100.00						
2	39.02	100.00					
3	50.50	75.09	100.00				
4	41.86	46.68	51.81	100.00			
5	43.91	43.91	55.74	85.58	100.00		
6	38.16	25.82	34.31	57.62	67.40	100.00	
7	42.21	35.44	42.81	74.35	81.50	70.69	100.00

NOV 1985

	1	2	3	4	5	6	7
1	100.00						
2	80.83	100.00					
3	55.32	61.26	100.00				
4	14.15	16.12	24.37	100.00			
5	17.06	18.85	28.32	84.12	100.00		
6	9.16	10.45	15.82	75.06	67.29	100.00	
7	7.65	7.99	12.42	63.81	56.62	83.87	100.00

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1 = Tennessee River Mile 496.5.
2 = Tennessee River Mile 506.6.
3 = Tennessee River Mile 518.0.
4 = Tennessee River Mile 527.4.
5 = Tennessee River Mile 528.0.
6 = Tennessee River Mile 529.5.
7 = Tennessee River Mile 532.1.

*Data not available from all collection sites.

APPENDIX 5-L

SUMMARY OF ZOOPLANKTON DATA COLLECTED DURING PREOPERATIONAL MONITORING PERIODS, WATTS BAR NUCLEAR PLANT

Appendix 5-L. Summary of Zooplankton Data (No./m^3) Collected During Preoperational Monitoring Periods, Watts Bar Nuclear Plant

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Feb 1973	496.5	1	Total	55143	55143		
		1	Cladocera	99	99		
		1	Copepoda	1502	1502		
		1	Rotifera	53542	53542		
Feb 1973	506.6	1	Total	25521	14684	15325.8	104.37
		2		3847			
		1	Cladocera	174	155	26.9	17.34
		2		136			
		1	Copepoda	2233	2155	111.0	5.15
		2		2076			
		1	Rotifera	23114	12375	15187.9	122.74
		2		1635			
Feb 1973	518.0	1	Total	22949	24130	1670.2	6.92
		2		25311			
		1	Cladocera	203	232	41.0	17.68
		2		261			
		1	Copepoda	1361	1747	545.9	31.25
		2		2133			
		1	Rotifera	21385	22151	1083.3	4.89
		2		22917			
Feb 1973	527.4	1	Total	27895	36039	11517.4	31.96
		2		44183			
		1	Cladocera	177	493	446.9	90.65
		2		809			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	2829	3802	1375.3	36.18
		2		4774			
		1	Rotifera	24889	31745	9695.1	30.54
		2		38600			
Feb 1973	528.0	1	Total	32503	27518	7050.6	25.62
		2		22532			
		1	Cladocera	544	508	50.9	10.02
		2		472			
		1	Copepoda	4521	4502	27.6	0.61
		2		4482			
		1	Rotifera	27438	22508	6972.1	30.98
		2		17578			
Feb 1973	529.5	1	Total	21057	13274	11007.5	82.93
		2		5490			
		1	Cladocera	250	202	67.9	33.61
		2		154			
		1	Copepoda	2539	1731	1142.7	66.01
		2		923			
		1	Rotifera	18268	11341	9797.0	86.39
		2		4413			
Feb 1973	532.1	1	Total	17562	20516	4177.6	20.36
		2		23470			
		1	Cladocera	678	686	11.3	1.65
		2		694			
		1	Copepoda	5252	4917	473.8	9.64
		2		4582			
		1	Rotifera	11632	14913	4640.0	31.11
		2		18194			

Appendix 5-L.

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
May 1973	496.5	1	Total	49924	48540	1958.0	4.03
		2		47155			
		1	Cladocera	25969	24393	2229.5	9.14
		2		22816			
		1	Copepoda	2304	2648	486.5	18.37
		2		2992			
		1	Rotifera	21651	21499	215.0	1.00
		2		21347			
May 1973	506.6	1	Total	41751	49101	10394.5	21.17
		2		56451			
		1	Cladocera	35411	42106	9467.5	22.49
		2		48800			
		1	Copepoda	1704	1459	346.5	23.75
		2		1214			
		1	Rotifera	4636	5537	1273.5	23.00
		2		6437			
May 1973	518.0	1	Total	46641	73679	38236.8	51.90
		2		100716			
		1	Cladocera	30766	45790	21247.1	46.40
		2		60814			
		1	Copepoda	1708	2018	437.7	21.70
		2		2327			
		1	Rotifera	14167	25871	16552.0	63.98
		2		37575			
May 1973	527.4	1	Total	85799	98546	18027.0	18.29
		2		111293			
		1	Cladocera	36837	41226	6206.3	15.05
		2		45614			
		1	Copepoda	3997	3819	251.7	6.59
		2		3641			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	44965	53502	12072.4	22.56
		2		62038			
May 1973	528.0	1	Total	250830	192413	82614.8	42.94
		2		133995			
		1	Cladocera	100544	77906	32015.0	41.09
		2		55268			
		1	Copepoda	11530	9221	3265.4	35.41
		2		6912			
		1	Rotifera	138756	105286	47334.4	44.96
		2		71815			
May 1973	529.5	1	Total	197070	148877	68155.2	45.78
		2		100684			
		1	Cladocera	81655	64102	24824.4	38.73
		2		46548			
		1	Copepoda	17675	13550	5833.6	43.05
		2		9425			
		1	Rotifera	97740	71226	37497.2	52.65
		2		44711			
May 1973	532.1	1	Total	174825	246459	101305.1	41.10
		2		318092			
		1	Cladocera	55604	82993	38733.9	46.67
		2		110382			
		1	Copepoda	17450	23820	9008.5	37.82
		2		30190			
		1	Rotifera	101771	139646	53562.6	38.36
		2		177520			

Appendix 5-L.

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Aug 1973	496.5	1	Total	19233	17129	2976.2	17.38
		2		15024			
		1	Cladocera	8879	8283	843.6	10.19
		2		7686			
		1	Copepoda	2523	2373	212.1	8.94
		2		2223			
		1	Rotifera	7831	6473	1920.5	29.67
		2		5115			
Aug 1973	506.6	1	Total	36902	31340	7866.6	25.10
		2		25777			
		1	Cladocera	17794	15253	3593.5	23.56
		2		12712			
		1	Copepoda	3531	2774	1071.3	38.63
		2		2016			
		1	Rotifera	15574	13312	3199.7	24.04
		2		11049			
Aug 1973	518.0	1	Total	37933	69187	44199.8	63.88
		2		100441			
		1	Cladocera	4571	8924	6155.4	68.98
		2		13276			
		1	Copepoda	2158	3390	1742.3	51.40
		2		4622			
		1	Rotifera	31204	56874	36302.2	63.83
		2		82543			
Aug 1973	527.4	1	Total	65864	86831	29651.1	34.15
		2		107797			
		1	Cladocera	7095	10447	4740.4	45.38
		2		13799			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	6268	7334	1507.6	20.56
		2		8400			
		1	Rotifera	52501	69050	23403.1	33.89
		2		85598			
Aug 1973	528.0	1	Total	116748	152213	50155.1	32.95
		2		187678			
		1	Cladocera	18689	20937	3178.4	15.18
		2		23184			
		1	Copepoda	9035	12233	4522.7	36.97
		2		15431			
		1	Rotifera	89024	119044	42454.0	35.66
		2		149063			
Aug 1973	529.5	1	Total	283028	227679	78275.3	34.38
		2		172330			
		1	Cladocera	50813	40397	14730.4	36.46
		2		29981			
		1	Copepoda	36499	28354	11518.8	40.62
		2		20209			
		1	Rotifera	195716	158928	52026.1	32.74
		2		122140			
Aug 1973	532.1	1	Total	290993	290482	722.7	0.25
		2		289971			
		1	Cladocera	39909	51856	16894.9	32.58
		2		63802			
		1	Copepoda	22151	27412	7440.2	27.14
		2		32673			
		1	Rotifera	228932	211214	25057.0	11.86
		2		193496			

Appendix 5-L.

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1973	496.5	1	Total	1942	1918	34.6	1.81
		2		1893			
		1	Cladocera	791	847	78.5	9.27
		2		902			
		1	Copepoda	458	442	22.6	5.12
		2		426			
		1	Rotifera	693	629	90.5	14.39
		2		565			
Nov 1973	506.6	1	Total	2291	1938	499.2	25.76
		2		1585			
		1	Cladocera	925	954	41.0	4.30
		2		983			
		1	Copepoda	516	336	254.6	75.76
		2		156			
		1	Rotifera	850	648	285.7	44.09
		2		446			
Nov 1973	518.0	1	Total	2255	2790	756.6	27.12
		2		3325			
		1	Cladocera	937	1176	338.0	28.74
		2		1415			
		1	Copepoda	434	480	65.1	13.55
		2		526			
		1	Rotifera	884	1134	353.6	31.18
		2		1384			
Nov 1973	527.4	1	Total	6954	6618	475.9	7.19
		2		6281			
		1	Cladocera	3148	3196	67.2	2.10
		2		3243			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	1640	1610	43.1	2.68
		2		1579			
		1	Rotifera	2166	1813	499.9	27.58
		2		1459			
Nov 1973	528.0	1	Total	9606	11879	3213.8	27.06
		2		14151			
		1	Cladocera	4275	5223	1340.0	25.66
		2		6170			
		1	Copepoda	2247	2853	856.3	30.02
		2		3458			
		1	Rotifera	3084	3804	1017.5	26.75
		2		4523			
Nov 1973	529.5	1	Total	21685	18458	4564.4	24.73
		2		15230			
		1	Cladocera	5499	4746	1064.9	22.44
		2		3993			
		1	Copepoda	8661	7434	1735.2	23.34
		2		6207			
		1	Rotifera	7525	6278	1764.2	28.10
		2		5030			
Nov 1973	532.1	1	Total	31085	35867	6762.1	18.85
		2		40648			
		1	Cladocera	7463	8797	1885.9	21.44
		2		10130			
		1	Copepoda	8840	8019	1161.8	14.49
		2		7197			
		1	Rotifera	14782	19052	6038.0	31.69
		2		23321			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Feb 1974	496.5	1	Total	4063	5041	1382.4	27.43
		2		6018			
		1	Cladocera	230	289	82.7	28.68
		2		347			
		1	Copepoda	822	1207	544.5	45.11
		2		1592			
		1	Rotifera	3011	3545	755.2	21.30
		2		4079			
Feb 1974	506.6	1	Total	5019	4876	202.9	4.16
		2		4732			
		1	Cladocera	427	404	32.5	8.05
		2		381			
		1	Copepoda	1226	1325	139.3	10.52
		2		1423			
		1	Rotifera	3366	3147	309.7	9.84
		2		2928			
Feb 1974	518.0	1	Total	3636	3322	444.1	13.37
		2		3008			
		1	Cladocera	162	231	97.6	42.24
		2		300			
		1	Copepoda	1055	971	119.5	12.31
		2		886			
		1	Rotifera	2419	2121	422.1	19.91
		2		1822			
Feb 1974	527.4	1	Total	4809	6118	1851.2	30.26
		2		7427			
		1	Cladocera	383	406	31.8	7.85
		2		428			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	1538	1770	328.1	18.54
		2		2002			
		1	Rotifera	2888	3943	1491.3	37.83
		2		4997			
Feb 1974	528.0	1	Total	3672	4407	1039.4	23.59
		2		5142			
		1	Cladocera	364	366	2.8	0.77
		2		368			
		1	Copepoda	1069	1270	283.5	22.34
		2		1470			
		1	Rotifera	2239	2772	753.1	27.17
		2		3304			
Feb 1974	529.5	1	Total	3090	3785	982.2	25.95
		2		4479			
		1	Cladocera	173	189	22.6	11.97
		2		205			
		1	Copepoda	928	1002	103.9	10.38
		2		1075			
		1	Rotifera	1989	2594	855.6	32.98
		2		3199			
Feb 1974	532.1	1	Total	2049	5242	4514.9	86.14
		2		8434			
		1	Cladocera	231	343	158.4	46.18
		2		455			
		1	Copepoda	529	1162	895.2	77.04
		2		1795			
		1	Rotifera	1289	3737	3461.3	92.63
		2		6184			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
May 1974	496.5	1	Total	42628	44592	2776.8	6.23
		2		46555			
		1	Cladocera	16168	13562	3685.4	27.17
		2		10956			
		1	Copepoda	1883	1700	258.8	15.22
		2		1517			
		1	Rotifera	24577	29330	6721.0	22.92
		2		34082			
May 1974	506.6	1	Total	16595	22478	8319.1	37.01
		2		28360			
		1	Cladocera	13164	16980	5395.9	31.78
		2		20795			
		1	Copepoda	1203	2426	1729.6	71.29
		2		3649			
		1	Rotifera	2228	3072	1193.6	38.85
		2		3916			
May 1974	518.0	1	Total	8683	8360	456.8	5.46
		2		8037			
		1	Cladocera	4358	3873	686.6	17.73
		2		3387			
		1	Copepoda	620	609	16.3	2.67
		2		597			
		1	Rotifera	3705	3879	246.1	6.34
		2		4053			
May 1974	527.4	1	Total	37849	42595	6711.2	15.76
		2		47340			
		1	Cladocera	21293	26718	7671.4	28.71
		2		32142			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	2497	2593	135.8	5.24
		2		2689			
		1	Rotifera	14059	13284	1096.0	8.25
		2		12509			
May 1974	528.0	1	Total	53956	89214	49862.3	55.89
		2		124472			
		1	Cladocera	34651	57585	32433.6	56.32
		2		80519			
		1	Copepoda	5239	8419	4496.5	53.41
		2		11598			
		1	Rotifera	14066	23211	12932.3	55.72
		2		32355			
May 1974	529.5	1	Total	23234	56536	47096.1	83.30
		2		89838			
		1	Cladocera	15248	37476	31435.1	83.88
		2		59704			
		1	Copepoda	1560	6552	7059.8	107.75
		2		11544			
		1	Rotifera	6426	12508	8601.2	68.77
		2		18590			
May 1974	532.1	1	Total	114854	121619	9566.4	7.87
		2		128383			
		1	Cladocera	60906	57382	4983.7	8.69
		2		53858			
		1	Copepoda	17626	17806	253.9	1.43
		2		17985			
		1	Rotifera	36322	46431	14296.3	30.79
		2		56540			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Aug 1974	496.5	1	Total	9680	9312	520.4	5.59
		2		8944			
		1	Cladocera	3580	3480	142.1	4.08
		2		3379			
		1	Copepoda	3978	3555	598.2	16.83
		2		3132			
		1	Rotifera	2122	2278	219.9	9.66
		2		2433			
Aug 1974	506.6	1	Total	7066	7405	478.7	6.47
		2		7743			
		1	Cladocera	3878	4089	298.4	7.30
		2		4300			
		1	Copepoda	2743	3008	374.8	12.46
		2		3273			
		1	Rotifera	445	308	194.5	63.24
		2		170			
Aug 1974	518.0	1	Total	16880	17777	1267.8	7.13
		2		18673			
		1	Cladocera	9953	9726	321.0	3.30
		2		9499			
		1	Copepoda	6497	7596	1553.5	20.45
		2		8694			
		1	Rotifera	430	455	35.4	7.77
		2		480			
Aug 1974	527.4	1	Total	20217	21461	1758.6	8.19
		2		22704			
		1	Cladocera	5916	8584	3772.4	43.95
		2		11251			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	12616	11277	1894.3	16.80
		2		9937			
		1	Rotifera	1685	1601	119.5	7.47
		2		1516			
Aug 1974	528.0	1	Total	30638	31439	1132.8	3.60
		2		32240			
		1	Cladocera	16195	14525	2362.4	16.27
		2		12854			
		1	Copepoda	13071	14957	2666.5	17.83
		2		16842			
		1	Rotifera	1372	1958	828.7	42.33
		2		2544			
Aug 1974	529.5	1	Total	27433	26595	1185.8	4.46
		2		25756			
		1	Cladocera	9485	8897	832.3	9.35
		2		8308			
		1	Copepoda	15936	16044	152.7	0.95
		2		16152			
		1	Rotifera	2012	1654	506.3	30.61
		2		1296			
Aug 1974	532.1	1	Total	47099	58517	16147.5	27.59
		2		69935			
		1	Cladocera	20548	19321	1735.9	8.99
		2		18093			
		1	Copepoda	13953	18215	6027.4	33.09
		2		22477			
		1	Rotifera	12598	20982	11856.1	56.51
		2		29365			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1974	496.5	1	Total	10482	9801	963.8	9.83
		2		9119			
		1	Cladocera	2099	2877	1099.6	38.23
		2		3654			
		1	Copepoda	2683	2223	650.5	29.26
		2		1763			
		1	Rotifera	5700	4701	1412.8	30.05
		2		3702			
Nov 1974	506.6	1	Total	7599	7788	267.3	3.43
		2		7977			
		1	Cladocera	3800	3499	425.7	12.17
		2		3198			
		1	Copepoda	546	451	135.1	29.98
		2		355			
		1	Rotifera	3253	3839	828.0	21.57
		2		4424			
Nov 1974	518.0	1	Total	10305	12272	2781.1	22.66
		2		14238			
		1	Cladocera	2400	3082	964.5	31.29
		2		3764			
		1	Copepoda	312	394	115.3	29.29
		2		475			
		1	Rotifera	7593	8796	1701.3	19.34
		2		9999			
Nov 1974	527.4	1	Total	32080	27310	6745.8	24.70
		2		22540			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	7395	6449	1338.6	20.76
		2		5502			
		1	Copepoda	2376	1876	707.1	37.69
		2		1376			
		1	Rotifera	22309	18986	4700.1	24.76
		2		15662			
Nov 1974	528.0	1	Total	31099	35106	5666.8	16.14
		2		39113			
		1	Cladocera	7029	8339	1852.6	22.22
		2		9649			
		1	Copepoda	3955	4503	774.3	17.20
		2		5050			
		1	Rotifera	20115	22265	3039.9	13.65
		2		24414			
Nov 1974	529.5	1	Total	58522	71197	17924.4	25.18
		2		83871			
		1	Cladocera	13049	16239	4511.3	27.78
		2		19429			
		1	Copepoda	7828	10203	3358.8	32.92
		2		12578			
		1	Rotifera	37645	44754	10052.9	22.46
		2		51862			
Nov 1974	532.1	1	Total	96265	98689	3427.3	3.47
		2		101112			
		1	Cladocera	22505	23603	1552.1	6.58
		2		24700			
		1	Copepoda	17929	18720	1118.6	5.98
		2		19511			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	55831	56366	756.6	1.34
		2		56901			
Feb 1975	496.5	1	Total	13470	24228	15214.1	62.80
		2		34986			
		1	Cladocera	312	536	316.8	59.10
		2		760			
		1	Copepoda	3944	7363	4835.2	65.67
		2		10782			
		1	Rotifera	9214	16329	10062.1	61.62
		2		23444			
Feb 1975	506.6	1	Total	18185	15272	4119.6	26.97
		2		12359			
		1	Cladocera	567	553	20.5	3.71
		2		538			
		1	Copepoda	4463	3762	992.1	26.37
		2		3060			
		1	Rotifera	13155	10958	3107.0	28.35
		2		8761			
Feb 1975	518.0	1	Total	7594	11974	6194.3	51.73
		2		16354			
		1	Cladocera	385	592	292.7	49.45
		2		799			
		1	Copepoda	1456	2587	1599.5	61.83
		2		3718			
		1	Rotifera	5753	8795	4302.0	48.91
		2		11837			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Feb 1975	527.4	1	Total	17661	22375	6666.6	29.79
		2		27089			
		1	Cladocera	1293	1585	413.0	26.05
		2		1877			
		1	Copepoda	6859	7459	847.8	11.37
		2		8058			
		1	Rotifera	9509	13332	5405.8	40.55
		2		17154			
Feb 1975	528.0	1	Total	12169	11124	1478.6	13.29
		2		10078			
		1	Cladocera	912	973	85.6	8.80
		2		1033			
		1	Copepoda	4816	4524	413.7	9.14
		2		4231			
		1	Rotifera	6441	5628	1150.5	20.44
		2		4814			
Feb 1975	529.5	1	Total	13953	13583	523.3	3.85
		2		13213			
		1	Cladocera	1211	1258	65.8	5.23
		2		1304			
		1	Copepoda	5074	4717	505.6	10.72
		2		4359			
		1	Rotifera	7668	7609	83.4	1.10
		2		7550			
Feb 1975	532.1	1	Total	12432	15838	4816.8	30.41
		2		19244			
		1	Cladocera	884	1049	233.3	22.24
		2		1214			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	4454	6033	2232.3	37.01
		2		7611			
		1	Rotifera	7094	8757	2351.1	26.85
		2		10419			
May 1975	496.5	1	Total	92398	81033	16072.5	19.83
		2		69668			
		1	Cladocera	75528	62244	18787.1	30.18
		2		48959			
		1	Copepoda	3508	3393	162.6	4.79
		2		3278			
		1	Rotifera	13362	15397	2877.2	18.69
		2		17431			
May 1975	506.6	1	Total	54052	42669	16098.0	37.73
		2		31286			
		1	Cladocera	45707	31371	20274.2	64.63
		2		17035			
		1	Copepoda	1798	2012	302.6	15.04
		2		2226			
		1	Rotifera	6547	9286	3873.5	41.71
		2		12025			
May 1975	518.0	1	Total	66799	69006	3121.2	4.52
		2		71213			
		1	Cladocera	51526	52028	709.9	1.36
		2		52530			
		1	Copepoda	3888	3845	61.5	1.60
		2		3801			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	11385	13134	2472.8	18.83
		2		14882			
May 1975	527.4	1	Total	135754	114599	29917.7	26.11
		2		93444			
		1	Cladocera	108972	91686	24446.1	26.66
		2		74400			
		1	Copepoda	8901	8366	757.3	9.05
		2		7830			
		1	Rotifera	17881	14548	4714.3	32.41
		2		11214			
May 1975	528.0	1	Total	37771	41915	5859.8	13.98
		2		46058			
		1	Cladocera	13315	14729	1999.0	13.57
		2		16142			
		1	Copepoda	12658	13248	833.7	6.29
		2		13837			
		1	Rotifera	11798	13939	3027.1	21.72
		2		16079			
May 1975	529.5	1	Total	76583	86375	13847.3	16.03
		2		96166			
		1	Cladocera	53930	58917	7052.7	11.97
		2		63904			
		1	Copepoda	12063	15173	4397.5	28.98
		2		18282			
		2		13980			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
May 1975	532.1	1	Total	123849	138334	20484.9	14.81
		2		152819			
		1	Cladocera	80399	92060	16491.1	17.91
		2		103721			
		1	Copepoda	25557	25804	348.6	1.35
		2		26050			
		1	Rotifera	17893	20471	3645.1	17.81
		2		23048			
Aug 1975	496.5	1	Total	16493	16675	256.7	1.54
		2		16856			
		1	Cladocera	5697	5106	835.8	16.37
		2		4515			
		1	Copepoda	3492	3624	186.7	5.15
		2		3756			
		1	Rotifera	7304	7945	905.8	11.40
		2		8585			
Aug 1975	506.6	1	Total	22170	19199	4202.3	21.89
		2		16227			
		1	Cladocera	9482	8590	1262.2	14.69
		2		7697			
		1	Copepoda	4930	3632	1835.6	50.54
		2		2334			
		1	Rotifera	7758	6977	1104.5	15.83
		2		6196			
Aug 1975	518.0	1	Total	15835	17051	1719.0	10.08
		2		18266			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	5703	5612	128.7	2.29
		2		5521			
		1	Copepoda	4254	4461	292.0	6.55
		2		4667			
		1	Rotifera	5878	6978	1555.6	22.29
		2		8078			
Aug 1975	527.4	1	Total	67636	80368	18005.8	22.40
		2		93100			
		1	Cladocera	26397	30461	5746.7	18.87
		2		34524			
		1	Copepoda	13346	18044	6643.3	36.82
		2		22741			
		1	Rotifera	27893	31864	5615.8	17.62
		2		35835			
Aug 1975	528.0	1	Total	60345	53591	9552.3	17.82
		2		46836			
		1	Cladocera	19040	21575	3585.0	16.62
		2		24110			
		1	Copepoda	14857	11988	4057.4	33.85
		2		9119			
		1	Rotifera	26448	20028	9080.0	45.34
		2		13607			
Aug 1975	529.5	1	Total	49155	55832	9442.7	16.91
		2		62509			
		1	Cladocera	17626	21776	5868.3	26.95
		2		25925			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	19880	20631	1061.4	5.14
		2		21381			
		1	Rotifera	11649	13426	2513.1	18.72
		2		15203			
Aug 1975	532.1	1	Total	149167	168984	28024.8	16.58
		2		188800			
		1	Cladocera	44947	46841	2677.8	5.72
		2		48734			
		1	Copepoda	25845	25993	209.3	0.81
		2		26141			
		1	Rotifera	78375	96150	25137.6	26.14
		2		113925			
Nov 1975	496.5	1	Total	13022	12645	533.2	4.22
		2		12268			
		1	Cladocera	1197	1338	198.7	14.86
		2		1478			
		1	Copepoda	3336	3818	681.7	17.85
		2		4300			
		1	Rotifera	8489	7490	1413.5	18.87
		2		6490			
Nov 1975	506.6	1	Total	6468	5853	870.4	14.87
		2		5237			
		1	Cladocera	910	1084	245.4	22.65
		2		1257			
		1	Copepoda	2145	1957	265.9	13.59
		2		1769			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No. Group	Number	Mean	Std Dev	C.V.
		1 Rotifera	3413	2812	849.9	30.23
		2	2211			
Nov 1975	518.0	1 Total	9425	10778	1912.7	17.75
		2	12130			
		1 Cladocera	1314	1476	229.1	15.52
		2	1638			
		1 Copepoda	3376	3344	45.3	1.35
		2	3312			
		1 Rotifera	4735	5958	1728.9	29.02
		2	7180			
Nov 1975	527.4	1 Total	41197	50667	13392.6	26.43
		2	60137			
		1 Cladocera	7484	7011	668.9	9.54
		2	6538			
		1 Copepoda	11553	10861	979.3	9.02
		2	10168			
		1 Rotifera	22160	32796	15040.9	45.86
		2	43431			
Nov 1975	528.0	1 Total	70434	69090	1901.4	2.75
		2	67745			
		1 Cladocera	8460	8812	497.8	5.65
		2	9164			
		1 Copepoda	17907	18519	865.5	4.67
		2	19131			
		1 Rotifera	44067	41759	3264.7	7.82
		2	39450			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1975	529.5	1	Total	83826	91215	10448.9	11.46
		2		98603			
		1	Cladocera	11782	11115	944.0	8.49
		2		10447			
		1	Copepoda	26736	29554	3985.3	13.48
		2		32372			
		1	Rotifera	45308	50546	7407.7	14.66
		2		55784			
Nov 1975	532.1	1	Total	118041	118041		
		1	Cladocera	15715	15715		
		1	Copepoda	25014	25014		
		1	Rotifera	77312	77312		
Feb 1976*	496.5	1	Total	158765	129463	41439.3	32.01
		2		100161			
		1	Cladocera	1073	848	318.2	37.52
		2		623			
		1	Copepoda	19972	15376	6500.4	42.28
		2		10779			
		1	Rotifera	137720	113240	34620.7	30.57
		2		88759			
May 1976	496.5	1	Total	63430	66035	3684.0	5.58
		2		68640			
		1	Cladocera	34568	37778	4538.9	12.01
		2		40987			
		1	Copepoda	13875	13907	45.3	0.33
		2		13939			
		1	Rotifera	14987	14351	900.1	6.27
		2		13714			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
May 1976	506.6	1	Total	66310	66807	702.9	1.05
		2		67304			
		1	Cladocera	52413	52848	615.2	1.16
		2		53283			
		1	Copepoda	7368	8199	1175.2	14.33
		2		9030			
		1	Rotifera	6529	5760	1087.5	18.88
		2		4991			
May 1976	518.0	1	Total	78157	69962	11589.5	16.57
		2		61767			
		1	Cladocera	31176	28306	4059.5	14.34
		2		25435			
		1	Copepoda	22872	21770	1559.2	7.16
		2		20667			
		1	Rotifera	24109	19887	5970.8	30.02
		2		15665			
May 1976	527.4	1	Total	122549	130804	11673.6	8.92
		2		139058			
		1	Cladocera	62035	63942	2696.2	4.22
		2		65848			
		1	Copepoda	29079	32696	5115.2	15.64
		2		36313			
		1	Rotifera	31435	34166	3862.2	11.30
		2		36897			
May 1976	528.0	1	Total	136238	125208	15599.5	12.46
		2		114177			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	66916	56817	14282.1	25.14
		2		46718			
		1	Copepoda	33843	34827	1391.6	4.00
		2		35811			
		1	Rotifera	35479	33564	2708.9	8.07
		2		31648			
May 1976	529.5	1	Total	185799	177344	11957.9	6.74
		2		168888			
		1	Cladocera	87197	81554	7980.4	9.79
		2		75911			
		1	Copepoda	52626	46689	8396.9	17.98
		2		40751			
		1	Rotifera	45976	49101	4419.4	9.00
		2		52226			
May 1976	532.1	1	Total	193331	201471	11511.7	5.71
		2		209611			
		1	Cladocera	26338	32128	8188.3	25.49
		2		37918			
		1	Copepoda	103527	103843	446.2	0.43
		2		104158			
		1	Rotifera	63466	65501	2877.2	4.39
		2		67535			
Aug 1976	496.5	1	Total	33893	33948	77.1	0.23
		2		34002			
		1	Cladocera	4514	6380	2638.2	41.35
		2		8245			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	7742	7141	850.6	11.91
		2		6539			
		1	Rotifera	21637	20428	1710.5	8.37
		2		19218			
Aug 1976	506.6	1	Total	47918	49604	2384.4	4.81
		2		51290			
		1	Cladocera	7332	9558	3147.3	32.93
		2		11783			
		1	Copepoda	8611	8962	496.4	5.54
		2		9313			
		1	Rotifera	31975	31085	1259.4	4.05
		2		30194			
Aug 1976	518.0	1	Total	124162	137495	18855.7	13.71
		2		150828			
		1	Cladocera	20290	22935	3739.9	16.31
		2		25579			
		1	Copepoda	20247	17906	3311.4	18.49
		2		15564			
		1	Rotifera	83625	96655	18427.2	19.06
		2		109685			
Aug 1976	527.4	1	Total	368664	316357	73973.3	23.38
		2		264050			
		1	Cladocera	38828	34472	6160.3	17.87
		2		30116			
		1	Copepoda	31346	25571	8167.8	31.94
		2		19795			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	298490	256315	59645.2	23.27
		2		214139			
Aug 1976	528.0	1	Total	253508	253396	159.1	0.06
		2		253283			
		1	Cladocera	31457	28086	4767.3	16.97
		2		24715			
		1	Copepoda	27630	25152	3505.1	13.94
		2		22673			
		1	Rotifera	194421	200158	8113.3	4.05
		2		205895			
Aug 1976	529.5	1	Total	109445	100582	12534.2	12.46
		2		91719			
		1	Cladocera	26881	27526	911.5	3.31
		2		28170			
		1	Copepoda	13585	14981	1974.2	13.18
		2		16377			
		1	Rotifera	68979	58076	15419.9	26.55
		2		47172			
Aug 1976	532.1	1	Total	261821	220253	58786.0	26.69
		2		178685			
		1	Cladocera	30076	22634	10525.3	46.50
		2		15191			
		1	Copepoda	31067	23151	11194.9	48.36
		2		15235			
		1	Rotifera	200678	174469	37065.8	21.24
		2		148259			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1976	496.5	1	Total	5070	6328	1779.1	28.11
		2		7586			
		1	Cladocera	1494	1620	177.5	10.96
		2		1745			
		1	Copepoda	607	712	148.5	20.86
		2		817			
		1	Rotifera	2969	3997	1453.1	36.36
		2		5024			
Nov 1976	506.6	1	Total	6495	7864	1935.4	24.61
		2		9232			
		1	Cladocera	1795	2050	360.6	17.59
		2		2305			
		1	Copepoda	291	430	196.6	45.72
		2		569			
		1	Rotifera	4409	5384	1378.2	25.60
		2		6358			
Nov 1976	518.0	1	Total	23807	21634	3073.8	14.21
		2		19460			
		1	Cladocera	2619	2484	191.6	7.72
		2		2348			
		1	Copepoda	1220	1105	162.6	14.72
		2		990			
		1	Rotifera	19968	18045	2719.5	15.07
		2		16122			
Nov 1976	527.4	1	Total	31551	33524	2790.2	8.32
		2		35497			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	4116	3665	638.5	17.42
		2		3213			
		1	Copepoda	4621	4691	99.0	2.11
		2		4761			
		1	Rotifera	22814	25169	3329.8	13.23
		2		27523			
Nov 1976	528.0	1	Total	34374	31914	3479.7	10.90
		2		29453			
		1	Cladocera	3767	3093	953.2	30.82
		2		2419			
		1	Copepoda	5644	4980	939.7	18.87
		2		4315			
		1	Rotifera	24963	23841	1586.7	6.66
		2		22719			
Nov 1976	529.5	1	Total	31632	40248	12184.2	30.27
		2		48863			
		1	Cladocera	3169	3398	323.1	9.51
		2		3626			
		1	Copepoda	6601	7456	1208.4	16.21
		2		8310			
		1	Rotifera	21862	29395	10652.6	36.24
		2		36927			
Nov 1976	532.1	1	Total	67011	74144	10087.6	13.61
		2		81277			
		1	Cladocera	3919	5733	2564.7	44.74
		2		7546			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	16537	16047	693.0	4.32
		2		15557			
		1	Rotifera	46555	52365	8215.9	15.69
		2		58174			
Feb 1977	496.5	1	Total	76590	101024	34554.2	34.20
		2		125457			
		1	Cladocera	895	662	330.2	49.92
		2		428			
		1	Copepoda	9009	8346	938.3	11.24
		2		7682			
		1	Rotifera	66686	92017	35822.7	38.93
		2		117347			
Feb 1977	506.6	1	Total	227389	190167	52640.6	27.68
		2		152944			
		1	Cladocera	964	1239	388.9	31.39
		2		1514			
		1	Copepoda	14497	12539	2769.0	22.08
		2		10581			
		1	Rotifera	211928	176389	50260.4	28.49
		2		140849			
Feb 1977	518.0	1	Total	117738	115829	2700.4	2.33
		2		113919			
		1	Cladocera	246	730	683.8	93.73
		2		1213			
		1	Copepoda	10362	9154	1708.4	18.66
		2		7946			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	107130	105945	1675.8	1.58
		2		104760			
Feb 1977	527.4	1	Total	128629	145569	23956.1	16.46
		2		162508			
		1	Cladocera	759	725	48.1	6.63
		2		691			
		1	Copepoda	11312	15089	5340.8	35.40
		2		18865			
		1	Rotifera	116558	129755	18663.4	14.38
		2		142952			
Feb 1977	528.0	1	Total	160331	162162	2589.4	1.60
		2		163993			
		1	Cladocera	1237	996	341.5	34.31
		2		754			
		1	Copepoda	14755	13591	1646.9	12.12
		2		12426			
		1	Rotifera	144339	147576	4577.8	3.10
		2		150813			
Feb 1977	529.5	1	Total	154389	147919	9150.0	6.19
		2		141449			
		1	Cladocera	299	526	320.3	60.96
		2		752			
		1	Copepoda	12939	13614	953.9	7.01
		2		14288			
		1	Rotifera	141151	133780	10424.2	7.79
		2		126409			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Feb 1977	532.1	1	Total	146067	165259	27140.9	16.42
		2		184450			
		1	Cladocera	754	1073	450.4	42.00
		2		1391			
		1	Copepoda	17676	21551	5479.4	25.43
		2		25425			
		1	Rotifera	127637	142636	21211.1	14.87
		2		157634			
May 1977	496.5	1	Total	71147	71147		
		1	Cladocera	17007	17007		
		1	Copepoda	2581	2581		
		1	Rotifera	51559	51559		
May 1977	506.6	1	Total	36346	28202	11518.1	40.84
		2		20057			
		1	Cladocera	12977	8960	5680.9	63.40
		2		4943			
		1	Copepoda	1783	1314	664.0	50.55
		2		844			
		1	Rotifera	21586	17928	5173.2	28.86
		2		14270			
May 1977	518.0	1	Total	57490	55824	2356.1	4.22
		2		54158			
		1	Cladocera	9109	8218	1260.8	15.34
		2		7326			
		1	Copepoda	3578	2597	1388.1	53.46
		2		1615			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	44803	45010	292.7	0.65
		2		45217			
May 1977	527.4	1	Total	119606	187723	96331.3	51.32
		2		255839			
		1	Cladocera	27264	39845	17792.2	44.65
		2		52426			
		1	Copepoda	7398	15933	12069.6	75.75
		2		24467			
		1	Rotifera	84944	131945	66469.5	50.38
		2		178946			
May 1977	528.0	1	Total	88444	90830	3374.3	3.71
		2		93216			
		1	Cladocera	21609	20819	1117.2	5.37
		2		20029			
		1	Copepoda	5770	5717	75.7	1.32
		2		5663			
		1	Rotifera	61065	64295	4567.2	7.10
		2		67524			
May 1977	529.5	1	Total	178656	194944	23034.7	11.82
		2		211232			
		1	Cladocera	37854	45003	10109.5	22.46
		2		52151			
		1	Copepoda	28864	29919	1492.0	4.99
		2		30974			
		1	Rotifera	111938	120023	11433.2	9.53
		2		128107			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
May 1977	532.1	1	Total	200596	227723	38363.4	16.85
		2		254850			
		1	Cladocera	34382	40393	8500.1	21.04
		2		46403			
		1	Copepoda	34253	37017	3908.9	10.56
		2		39781			
		1	Rotifera	131961	150314	25954.4	17.27
		2		168666			
Aug 1977	496.5	1	Total	17195	25532	11790.3	46.18
		2		33869			
		1	Cladocera	2068	2706	901.6	33.32
		2		3343			
		1	Copepoda	4246	7108	4047.5	56.94
		2		9970			
		1	Rotifera	10881	15719	6841.3	43.52
		2		20556			
Aug 1977	506.6	1	Total	36634	31908	6684.3	20.95
		2		27181			
		1	Cladocera	7376	6755	878.2	13.00
		2		6134			
		1	Copepoda	13154	11306	2614.2	23.12
		2		9457			
		1	Rotifera	16104	13847	3191.9	23.05
		2		11590			
Aug 1977	518.0	1	Total	35147	30259	6912.7	22.85
		2		25371			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	7744	6367	1948.1	30.60
		2		4989			
		1	Copepoda	12618	11101	2146.1	19.33
		2		9583			
		1	Rotifera	14785	12767	2854.6	22.36
		2		10748			
Aug 1977	527.4	1	Total	88957	82704	8843.8	10.69
		2		76450			
		1	Cladocera	23822	19681	5856.3	29.76
		2		15540			
		1	Copepoda	19432	19999	801.9	4.01
		2		20566			
		1	Rotifera	45703	43024	3789.4	8.81
		2		40344			
Aug 1977	528.0	1	Total	46797	64984	25720.3	39.58
		2		83171			
		1	Cladocera	10369	14929	6448.1	43.19
		2		19488			
		1	Copepoda	13701	17223	4980.9	28.92
		2		20745			
		1	Rotifera	22727	32833	14291.3	43.53
		2		42938			
Aug 1977	529.5	1	Total	54929	62150	10211.3	16.43
		2		69370			
		1	Cladocera	12139	15103	4191.0	27.75
		2		18066			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	11700	13978	3221.6	23.05
		2		16256			
		1	Rotifera	31090	33069	2798.7	8.46
		2		35048			
Aug 1977	532.1	1	Total	165810	171093	7470.6	4.37
		2		176375			
		1	Cladocera	18830	13036	8194.7	62.86
		2		7241			
		1	Copepoda	29473	20533	12643.8	61.58
		2		11592			
		1	Rotifera	117507	137524	28308.3	20.58
		2		157541			
Nov 1977	496.5	1	Total	4999	4059	1330.1	32.77
		2		3118			
		1	Cladocera	395	419	33.9	8.10
		2		443			
		1	Copepoda	922	677	346.5	51.18
		2		432			
		1	Rotifera	3682	2963	1017.5	34.35
		2		2243			
Nov 1977	506.6	1	Total	17192	15215	2796.6	18.38
		2		13237			
		1	Cladocera	1280	1103	251.0	22.77
		2		925			
		1	Copepoda	1372	1092	396.7	36.34
		2		811			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	14540	13021	2148.9	16.50
		2		11501			
Nov 1977	518.0	1	Total	27058	20634	9084.9	44.03
		2		14210			
		1	Cladocera	1941	1261	961.7	76.26
		2		581			
		1	Copepoda	2138	1466	951.1	64.90
		2		793			
		1	Rotifera	22979	17908	7172.2	40.05
		2		12836			
Nov 1977	527.4	1	Total	36843	39228	3372.9	8.60
		2		41613			
		1	Cladocera	1354	2876	2151.7	74.83
		2		4397			
		1	Copepoda	6811	6228	824.5	13.24
		2		5645			
		1	Rotifera	28678	30125	2045.7	6.79
		2		31571			
Nov 1977	528.0	1	Total	37746	40958	4542.5	11.09
		2		44170			
		1	Cladocera	1205	2215	1427.6	64.47
		2		3224			
		1	Copepoda	6443	6596	216.4	3.28
		2		6749			
		1	Rotifera	30098	32148	2898.4	9.02
		2		34197			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1977	529.5	1	Total	157200	155486	2424.0	1.56
		2		153772			
		1	Cladocera	7611	7312	423.6	5.79
		2		7012			
		1	Copepoda	32776	30554	3143.1	10.29
		2		28331			
		1	Rotifera	116813	117621	1142.7	0.97
		2		118429			
Nov 1977	532.1	1	Total	132750	192282	84190.3	43.78
		2		251813			
		1	Cladocera	905	2069	1646.1	79.56
		2		3233			
		1	Copepoda	8058	10822	3908.2	36.11
		2		13585			
		1	Rotifera	123787	179391	78635.9	43.83
		2		234995			
May 1982	496.5	1	Total	315611	201752	101079.5	50.10
		2		122592			
		3		167054			
		1	Cladocera	171320	83086	77054.0	92.74
		2		29048			
		3		48891			
		1	Copepoda	21191	21928	4341.7	19.80
		2		18002			
		3		26591			
		1	Rotifera	123100	96738	24196.2	25.01
		2		75542			
		3		91572			

Appendix 5-L. (Continued)

Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
May 1982	506.6	1	Total	92135	105670	12775.2	12.09
		2		117518			
		3		107356			
		1	Cladocera	72281	88819	14466.9	16.29
		2		95045			
		3		99130			
		1	Copepoda	13486	11783	4658.1	39.53
		2		15350			
		3		6513			
		1	Rotifera	6368	5068	2929.9	57.81
		2		7123			
		3		1713			
May 1982	518.0	1	Total	181571	195411	12350.0	6.32
		2		199354			
		3		205308			
		1	Cladocera	95892	97238	4216.7	4.34
		2		93858			
		3		101963			
		1	Copepoda	30785	26615	6764.6	25.42
		2		18810			
		3		30250			
		1	Rotifera	54894	71558	15951.6	22.29
		2		86686			
		3		73095			
May 1982	527.4	1	Total	260759	232889	43074.6	18.50
		2		183277			
		3		254632			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	56009	49483	5651.9	11.42
		2		46144			
		3		46297			
		1	Copepoda	43398	40950	2345.8	5.73
		2		40729			
		3		38722			
		1	Rotifera	161352	142456	40095.8	28.15
		2		96404			
		3		169613			
May 1982	528.0	1	Total	185133	220406	41691.0	18.92
		2		209670			
		3		266415			
		1	Cladocera	36423	63806	23910.6	37.47
		2		74438			
		3		80556			
		1	Copepoda	24570	35981	14482.3	40.25
		2		31099			
		3		52273			
		1	Rotifera	124140	120620	15038.8	12.47
		2		104133			
		3		133586			
May 1982	529.5	1	Total	356341	204146	132122.1	64.72
		2		137205			
		3		118893			
		1	Cladocera	85875	47725	34035.3	71.31
		2		36827			
		3		20474			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	63404	39940	20936.0	52.42
		2		33249			
		3		23168			
		1	Rotifera	207062	116481	78550.8	67.44
		2		67129			
		3		75251			
May 1982	532.1	1	Total	231388	242720	25797.0	10.63
		2		272243			
		3		224528			
		1	Cladocera	84524	87823	5982.8	6.81
		2		94729			
		3		84216			
		1	Copepoda	70751	51574	16641.5	32.27
		2		43039			
		3		40931			
		1	Rotifera	76113	103323	29380.0	28.44
		2		134475			
		3		99381			
Aug 1982	496.5	1	Total	43546	29387	12390.6	42.16
		2		24085			
		3		20529			
		1	Cladocera	8502	5439	2722.9	50.06
		2		3292			
		3		4524			
		1	Copepoda	3938	2514	1284.6	51.09
		2		1442			
		3		2163			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	31106	21433	8818.3	41.14
		2		19351			
		3		13842			
Aug 1982	506.6	1	Total	7223	11706	4225.0	36.09
		2		12282			
		3		15614			
		1	Cladocera	2061	3783	1498.5	39.61
		2		4501			
		3		4788			
		1	Copepoda	1165	2091	865.3	41.38
		2		2229			
		3		2879			
		1	Rotifera	3997	5832	1989.8	34.12
		2		5552			
		3		7947			
Aug 1982	518.0	1	Total	12616	22441	8895.8	39.64
		2		24758			
		3		29949			
		1	Cladocera	2936	4944	1811.2	36.64
		2		5440			
		3		6455			
		1	Copepoda	2367	4561	1936.1	42.45
		2		6031			
		3		5284			
		1	Rotifera	7313	12937	5456.9	42.18
		2		13287			
		3		18210			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Aug 1982	527.4	1	Total	95001	88564	14957.5	16.89
		2		71466			
		3		99226			
		1	Cladocera	10608	8527	2419.7	28.38
		2		5872			
		3		9102			
		1	Copepoda	9791	8456	2542.6	30.07
		2		5524			
		3		10053			
		1	Rotifera	74602	71581	10337.1	14.44
		2		60070			
		3		80071			
Aug 1982	528.0	1	Total	40015	54787	17767.5	32.43
		2		49844			
		3		74503			
		1	Cladocera	3612	7198	3194.6	44.38
		2		8242			
		3		9740			
		1	Copepoda	7902	9037	1320.4	14.61
		2		8722			
		3		10486			
		1	Rotifera	28501	38553	13792.6	35.78
		2		32880			
		3		54277			
Aug 1982	529.5	1	Total	66535	58253	14971.3	25.70
		2		40971			
		3		67254			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	7265	7256	2158.0	29.74
		2		5094			
		3		9410			
		1	Copepoda	13192	9939	4034.0	40.59
		2		5425			
		3		11199			
		1	Rotifera	46078	41058	9189.7	22.38
		2		30452			
		3		46645			
Aug 1982	532.1	1	Total	21625	57659	47843.6	82.98
		2		39410			
		3		111941			
		1	Cladocera	2294	7855	7505.4	95.55
		2		4879			
		3		16392			
		1	Copepoda	3030	9394	9603.0	102.22
		2		4712			
		3		20440			
		1	Rotifera	16301	40410	30801.2	76.22
		2		29819			
		3		75109			
Nov 1982	496.5	1	Total	5068	3878	1074.6	27.71
		2		3589			
		3		2978			
		1	Cladocera	3568	2773	895.4	32.29
		2		2948			
		3		1803			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	793	596	246.9	41.43
		2		319			
		3		676			
		1	Rotifera	707	509	192.7	37.84
		2		322			
		3		499			
Nov 1982	506.6	1	Total	3938	2771	1776.1	64.10
		2		3648			
		3		727			
		1	Cladocera	3320	2278	1526.9	67.04
		2		2988			
		3		525			
		1	Copepoda	140	273	249.7	91.45
		2		561			
		3		118			
		1	Rotifera	478	220	223.3	101.33
		2		99			
		3		84			
Nov 1982	518.0	1	Total	3432	4138	650.5	15.72
		2		4269			
		3		4713			
		1	Cladocera	1475	1889	360.6	19.09
		2		2135			
		3		2057			
		1	Copepoda	569	738	234.1	31.74
		2		639			
		3		1005			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	1388	1511	132.3	8.75
		2		1495			
		3		1651			
Nov 1982	527.4	1	Total	11437	13307	3886.8	29.21
		2		10708			
		3		17775			
		1	Cladocera	4283	5088	1993.8	39.19
		2		7358			
		3		3622			
		1	Copepoda	1234	1363	124.3	9.12
		2		1374			
		3		1482			
		1	Rotifera	5920	6856	5408.5	78.89
		2		1976			
		3		12671			
Nov 1982	528.0	1	Total	10259	21775	16415.6	75.39
		2		14495			
		3		40572			
		1	Cladocera	4940	5075	3205.1	63.15
		2		1940			
		3		8346			
		1	Copepoda	1144	1602	498.5	31.12
		2		1529			
		3		2133			
		1	Rotifera	4175	15098	13430.2	88.95
		2		11026			
		3		30093			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1982	529.5	1	Total	38145	27093	13456.0	49.67
		2		12109			
		3		31025			
		1	Cladocera	7927	5729	2425.3	42.34
		2		3127			
		3		6132			
		1	Copepoda	11470	6933	4176.9	60.24
		2		3247			
		3		6083			
		1	Rotifera	18748	14431	7531.0	52.19
		2		5735			
		3		18810			
Nov 1982	532.1	1	Total	23444	21256	6917.2	32.54
		2		26814			
		3		13509			
		1	Cladocera	4255	3565	1713.6	48.07
		2		4826			
		3		1614			
		1	Copepoda	5130	4595	1683.5	36.64
		2		5946			
		3		2709			
		1	Rotifera	14059	13096	3528.1	26.94
		2		16042			
		3		9186			
Feb 1983	496.5	1	Total	31126	26643	3932.7	14.76
		2		23776			
		3		25026			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	1673	1885	1005.5	53.33
		2		2980			
		3		1003			
		1	Copepoda	3088	2070	918.3	44.36
		2		1818			
		3		1304			
		1	Rotifera	26365	22687	3693.6	16.28
		2		18978			
		3		22719			
Feb 1983	506.6	1	Total	15225	19362	4579.6	23.65
		2		24283			
		3		18578			
		1	Cladocera	421	599	618.9	103.38
		2		1287			
		3		88			
		1	Copepoda	1587	1963	1220.2	62.16
		2		3327			
		3		975			
		1	Rotifera	13217	16800	3284.8	19.55
		2		19669			
		3		17515			
Feb 1983	518.0	1	Total	6190	23105	18719.3	81.02
		2		19909			
		3		43217			
		1	Cladocera	0	279	261.6	93.88
		2		519			
		3		317			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	741	1537	951.7	61.94
		2		1278			
		3		2591			
		1	Rotifera	5449	21290	17646.0	82.88
		2		18112			
		3		40309			
Feb 1983	527.4	1	Total	15927	19592	3556.0	18.15
		2		19820			
		3		23028			
		1	Cladocera	304	360	147.8	41.01
		2		249			
		3		528			
		1	Copepoda	1145	943	347.0	36.81
		2		1141			
		3		542			
		1	Rotifera	14478	18289	3742.0	20.46
		2		18430			
		3		21958			
Feb 1983	528.0	1	Total	41007	24282	14629.1	60.25
		2		13868			
		3		17970			
		1	Cladocera	651	542	96.4	17.78
		2		507			
		3		468			
		1	Copepoda	2532	1819	829.9	45.62
		2		908			
		3		2017			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	37824	21921	13855.9	63.21
		2		12453			
		3		15485			
Feb 1983	529.5	1	Total	7559	14758	10594.4	71.79
		2		26923			
		3		9791			
		1	Cladocera	295	474	340.8	71.90
		2		867			
		3		260			
		1	Copepoda	650	1142	602.5	52.76
		2		1814			
		3		962			
		1	Rotifera	6614	13142	9662.7	73.53
		2		24242			
		3		8569			
Feb 1983	532.1	1	Total	6430	23935	18633.5	77.85
		2		21852			
		3		43522			
		1	Cladocera	156	983	812.4	82.67
		2		1012			
		3		1780			
		1	Copepoda	379	1211	1190.7	98.33
		2		679			
		3		2575			
		1	Rotifera	5895	21741	16692.2	76.78
		2		20161			
		3		39167			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Jun 1983	496.5	1	Total	9586	6776	2810.0	41.47
		2		6775			
		3		3966			
		1	Cladocera	1266	790	412.6	52.25
		2		543			
		3		560			
		1	Copepoda	712	481	203.7	42.38
		2		402			
		3		328			
		1	Rotifera	7608	5505	2282.4	41.46
		2		5830			
		3		3078			
Jun 1983	506.6	1	Total	26646	22249	10793.2	48.51
		2		30149			
		3		9951			
		1	Cladocera	1381	1360	1004.2	73.82
		2		2354			
		3		346			
		1	Copepoda	961	714	430.1	60.27
		2		963			
		3		217			
		1	Rotifera	24304	20175	9426.7	46.73
		2		26832			
		3		9388			
Jun 1983	518.0	1	Total	150165	168117	73290.5	43.59
		2		248716			
		3		105471			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	18945	11054	7503.0	67.88
		2		10206			
		3		4011			
		1	Copepoda	2313	790	1319.0	166.96
		2		28			
		3		29			
		1	Rotifera	128907	156273	72508.1	46.40
		2		238482			
		3		101431			
Jun 1983	527.4	1	Total	249150	208864	73365.0	35.13
		2		124183			
		3		253260			
		1	Cladocera	13547	8274	7255.2	87.68
		2		0			
		3		11276			
		1	Copepoda	7493	3361	3805.4	113.21
		2		0			
		3		2591			
		1	Rotifera	228110	197229	63510.5	32.20
		2		124183			
		3		239393			
Jun 1983	528.0	1	Total	359644	278560	163656.3	58.75
		2		90192			
		3		385843			
		1	Cladocera	26546	12255	12589.4	102.73
		2		2802			
		3		7418			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	5187	6070	2867.8	47.25
		2		3747			
		3		9275			
		1	Rotifera	327911	260235	154316.6	59.30
		2		83643			
		3		369150			
Jun 1983	529.5	1	Total	205663	306247	102679.5	33.53
		2		302176			
		3		410901			
		1	Cladocera	4313	27831	34910.9	125.44
		2		67944			
		3		11236			
		1	Copepoda	7740	13751	7797.4	56.70
		2		10952			
		3		22562			
		1	Rotifera	193610	264664	98498.3	37.22
		2		223280			
		3		377103			
Jun 1983	532.1	1	Total	101032	142885	88508.8	61.94
		2		244558			
		3		83064			
		1	Cladocera	1979	5640	3870.7	68.63
		2		9691			
		3		5251			
		1	Copepoda	3055	5275	3827.0	72.55
		2		9694			
		3		3076			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	95998	131969	81413.8	61.69
		2		225173			
		3		74737			
Aug 1983	496.5	1	Total	15187	23663	7727.6	32.66
		2		25487			
		3		30316			
		1	Cladocera	310	7745	6484.7	83.73
		2		10690			
		3		12234			
		1	Copepoda	3461	2956	439.8	14.88
		2		2747			
		3		2659			
		1	Rotifera	11416	12963	2153.9	16.62
		2		12050			
		3		15423			
Aug 1983	506.6	1	Total	42596	26201	14424.3	55.05
		2		20546			
		3		15461			
		1	Cladocera	22920	14172	7661.9	54.06
		2		10942			
		3		8654			
		1	Copepoda	4868	3095	1722.4	55.65
		2		2989			
		3		1428			
		1	Rotifera	14808	8934	5124.4	57.36
		2		6615			
		3		5379			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Aug 1983	518.0	1	Total	36421	41359	4353.8	10.53
		2		43009			
		3		44646			
		1	Cladocera	8025	10440	3066.6	29.37
		2		13890			
		3		9404			
		1	Copepoda	4939	6039	1036.3	17.16
		2		6997			
		3		6180			
		1	Rotifera	23457	24880	3682.4	14.80
		2		22122			
		3		29062			
Aug 1983	527.4	1	Total	70391	64224	13837.7	21.55
		2		73906			
		3		48375			
		1	Cladocera	13493	12937	895.7	6.92
		2		13415			
		3		11904			
		1	Copepoda	14002	11465	2331.6	20.34
		2		10977			
		3		9416			
		1	Rotifera	42896	39822	11540.8	28.98
		2		49514			
		3		27055			
Aug 1983	528.0	1	Total	69413	67948	13023.4	19.17
		2		54254			
		3		80177			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	9820	11365	1367.3	12.03
		2		11856			
		3		12419			
		1	Copepoda	15011	11863	3329.9	28.07
		2		8377			
		3		12201			
		1	Rotifera	44582	44720	10768.7	24.08
		2		34021			
		3		55557			
Aug 1983	529.5	1	Total	62502	63501	31350.9	49.37
		2		95339			
		3		32661			
		1	Cladocera	15517	15611	9423.8	60.37
		2		25081			
		3		6234			
		1	Copepoda	19505	21652	10558.9	48.77
		2		33119			
		3		12331			
		1	Rotifera	27480	26238	11571.6	44.10
		2		37139			
		3		14096			
Aug 1983	532.1	1	Total	180054	103599	84400.0	81.47
		2		117711			
		3		13033			
		1	Cladocera	32339	17176	15582.2	90.72
		2		17984			
		3		1206			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	20006	11589	9508.6	82.05
		2		13487			
		3		1275			
		1	Rotifera	127709	74834	59405.5	79.38
		2		86240			
		3		10552			
Nov 1983	496.5	1	Total	16602	13854	2819.6	20.35
		2		10968			
		3		13993			
		1	Cladocera	14148	12298	1960.5	15.94
		2		10243			
		3		12502			
		1	Copepoda	571	515	96.4	18.71
		2		404			
		3		571			
		1	Rotifera	1883	1041	788.0	75.68
		2		321			
		3		920			
Nov 1983	506.6	1	Total	6372	5216	1978.1	37.92
		2		2932			
		3		6344			
		1	Cladocera	5114	4423	1646.7	37.23
		2		2543			
		3		5611			
		1	Copepoda	519	424	133.2	31.39
		2		272			
		3		482			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	739	369	327.4	88.72
		2		117			
		3		251			
Nov 1983	518.0	1	Total	11417	15274	3645.7	23.87
		2		15743			
		3		18663			
		1	Cladocera	6068	9472	2949.6	31.14
		2		11280			
		3		11067			
		1	Copepoda	799	587	245.5	41.83
		2		318			
		3		644			
		1	Rotifera	4550	5216	1517.3	29.09
		2		4145			
		3		6952			
Nov 1983	527.4	1	Total	30398	32048	4499.0	14.04
		2		28607			
		3		37139			
		1	Cladocera	13868	13866	2266.0	16.34
		2		11599			
		3		16131			
		1	Copepoda	2507	3580	1527.9	42.68
		2		2903			
		3		5329			
		1	Rotifera	14023	14602	933.3	6.39
		2		14105			
		3		15679			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Nov 1983	528.0	1	Total	34835	46246	34998.6	75.68
		2		85526			
		3		18377			
		1	Cladocera	15462	19152	12106.9	63.21
		2		32675			
		3		9320			
		1	Copepoda	4759	4354	2780.2	63.85
		2		6910			
		3		1394			
		1	Rotifera	14614	22739	20391.6	89.68
		2		45941			
		3		7663			
Nov 1983	529.5	1	Total	109603	86340	26064.5	30.19
		2		91245			
		3		58171			
		1	Cladocera	37714	32949	10890.6	33.05
		2		40645			
		3		20488			
		1	Copepoda	22853	17074	5887.4	34.48
		2		17286			
		3		11084			
		1	Rotifera	49036	36316	11515.9	31.71
		2		33314			
		3		26599			
Nov 1983	532.1	1	Total	11811	23669	10977.1	46.38
		2		25719			
		3		33476			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Cladocera	3721	8239	4336.2	52.63
		2		8629			
		3		12367			
		1	Copepoda	2107	4710	2456.6	52.16
		2		6988			
		3		5034			
		1	Rotifera	5983	10720	5074.3	47.33
		2		10102			
		3		16075			
Feb 1984	496.5	1	Total	34516	19029	15900.5	83.56
		2		2745			
		3		19825			
		1	Cladocera	791	801	611.6	76.38
		2		194			
		3		1417			
		1	Copepoda	5541	2920	2527.9	86.58
		2		497			
		3		2721			
		1	Rotifera	28184	15308	13069.1	85.37
		2		2054			
		3		15687			
Feb 1984	506.6	1	Total	6422	7072	769.9	10.89
		2		7922			
		3		6871			
		1	Cladocera	128	189	176.2	93.06
		2		388			
		3		52			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Copepoda	593	910	274.4	30.17
		2		1078			
		3		1058			
		1	Rotifera	5701	5973	419.7	7.03
		2		6456			
		3		5761			
Feb 1984	518.0	1	Total	22415	16468	5340.7	32.43
		2		14908			
		3		12081			
		1	Cladocera	834	417	363.4	87.08
		2		252			
		3		166			
		1	Copepoda	5778	3413	2082.5	61.02
		2		2607			
		3		1854			
		1	Rotifera	15803	12638	2915.9	23.07
		2		12049			
		3		10061			
Feb 1984	527.4	1	Total	41451	27337	12277.4	44.91
		2		21437			
		3		19124			
		1	Cladocera	1352	766	604.3	78.85
		2		802			
		3		145			
		1	Copepoda	6995	4297	2365.7	55.06
		2		2579			
		3		3316			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
		1	Rotifera	33104	22274	9454.8	42.45
		2		18056			
		3		15663			
Feb 1984	528.0	1	Total	19816	27579	10229.9	37.09
		2		23750			
		3		39171			
		1	Cladocera	318	543	671.0	123.50
		2		1298			
		3		14			
		1	Copepoda	5094	7031	3426.5	48.74
		2		5011			
		3		10987			
		1	Rotifera	14404	20005	7232.3	36.15
		2		17441			
		3		28170			
Feb 1984	529.5	1	Total	13520	14992	4193.5	27.97
		2		19723			
		3		11733			
		1	Cladocera	546	690	411.0	59.53
		2		1154			
		3		371			
		1	Copepoda	3032	3037	960.0	31.61
		2		3999			
		3		2079			
		1	Rotifera	9942	11265	2881.1	25.58
		2		14570			
		3		9283			

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Quarter	River Mile	Rep No.	Group	Number	Mean	Std Dev	C.V.
Feb 1984	532.1	1	Total	28078	34591	11782.0	34.06
		2		27504			
		3		48192			
		1	Cladocera	804	943	273.7	29.04
		2		766			
		3		1258			
		1	Copepoda	5228	6752	1844.0	27.31
		2		6227			
		3		8802			
		1	Rotifera	22046	26896	9760.6	36.29
		2		20511			
		3		38132			

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
May 1984	496.5	CLADOCERA	2880	1461	1375	1905	845.2	44.36
		COPEPODA	1183	634	610	809	324.1	40.06
		ROTIFERA	9960	3834	6560	6785	3069.2	45.24
		TOTAL	14023	5929	8545	9499	4130.5	43.48
May 1984	506.6	CLADOCERA	1434	1109	1696	1413	294.1	20.81
		COPEPODA	613	891	390	631	251.0	39.76
		ROTIFERA	5531	3903	8960	6131	2581.4	42.10
		TOTAL	7578	5903	11046	8176	2623.1	32.08
May 1984	518.0	CLADOCERA	1577	269	3645	1830	1702.2	93.00
		COPEPODA	832	90	1394	772	654.1	84.72
		ROTIFERA	30448	2299	55286	29344	26510.7	90.34
		TOTAL	32857	2658	60325	31947	28844.3	90.29
May 1984	527.4	CLADOCERA	10968	7194	21774	13312	7567.4	56.85
		COPEPODA	3615	6801	9996	6804	3190.5	46.89
		ROTIFERA	81611	96551	215440	131201	73334.8	55.90
		TOTAL	96194	110546	247210	151317	83355.5	55.09
May 1984	528.0	CLADOCERA	10288	782	9851	6974	5366.6	76.96
		COPEPODA	8430	628	4444	4501	3901.3	86.68
		ROTIFERA	211990	21869	116265	116708	95061.3	81.45
		TOTAL	230708	23279	130560	128182	103734.9	80.93
May 1984	529.5	CLADOCERA	12246	2909	8883	8013	4729.0	59.02
		COPEPODA	7687	3689	10875	7417	3600.6	48.55
		ROTIFERA	92053	35961	123399	83804	44298.8	52.86
		TOTAL	111986	42559	143157	99234	51497.1	51.89

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
May 1984	532.1	CLADOCERA	3461	6554	19999	10005	8792.4	87.88
		COPEPODA	3918	11190	10609	8572	4041.2	47.14
		ROTIFERA	58893	349990	384250	264378	178777.5	67.62
		TOTAL	66272	367734	414858	282955	189126.2	66.84
Aug 1984	496.5	CLADOCERA	1042	6464	9750	5752	4397.4	76.45
		COPEPODA	567	2854	5849	3090	2648.9	85.72
		ROTIFERA	1643	13250	19212	11368	8934.4	78.59
		TOTAL	3252	22568	34811	20210	15911.1	78.73
Aug 1984	506.6	CLADOCERA	6795	11447	9355	9199	2329.9	25.33
		COPEPODA	2141	2979	2940	2687	473.0	17.60
		ROTIFERA	11041	14739	16402	14061	2744.1	19.52
		TOTAL	19977	29165	28697	25946	5174.9	19.94
Aug 1984	518.0	CLADOCERA	2737	2805	2731	2758	41.1	1.49
		COPEPODA	2024	2330	1714	2023	308.0	15.23
		ROTIFERA	15263	27792	30250	24435	8037.7	32.89
		TOTAL	20024	32927	34695	29215	8008.9	27.41
Aug 1984	527.4	CLADOCERA	2918	4376	6272	4522	1681.8	37.19
		COPEPODA	2320	4790	7122	4744	2401.3	50.62
		ROTIFERA	29710	40091	84195	51332	28929.6	56.36
		TOTAL	34948	49257	97589	60598	32824.3	54.17
Aug 1984	528.0	CLADOCERA	2971	4921	5082	4325	1175.1	27.17
		COPEPODA	5053	11598	12121	9591	3938.4	41.07
		ROTIFERA	23911	65511	128733	72718	52781.4	72.58
		TOTAL	31935	82030	145936	86634	57139.8	65.96

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
Aug 1984	529.5	CLADOCERA	336	1300	8354	3330	4377.5	131.46
		COPEPODA	937	4527	16579	7348	8193.6	111.51
		ROTIFERA	8212	13912	69910	30678	34095.2	111.14
		TOTAL	9485	19739	94843	41356	46604.3	112.69
Aug 1984	532.1	CLADOCERA	10662	7486	12716	10288	2635.0	25.61
		COPEPODA	33933	22209	13678	23273	10169.4	43.70
		ROTIFERA	77945	48715	54626	60429	15454.8	25.58
		TOTAL	122540	78410	81021	93990	24759.2	26.34
Nov 1984	496.5	CLADOCERA	81	2738	1005	1275	1348.9	105.82
		COPEPODA	412	578	400	463	99.5	21.47
		ROTIFERA	265	486	359	370	110.9	29.98
		TOTAL	758	3802	1764	2108	1550.9	73.57
Nov 1984	506.6	CLADOCERA	3118	2433	6765	4105	2328.7	56.72
		COPEPODA	639	387	703	576	167.1	28.99
		ROTIFERA	340	209	405	318	99.8	31.39
		TOTAL	4097	3029	7873	5000	2545.0	50.90
Nov 1984	518.0	CLADOCERA	7353	3335	2606	4431	2556.4	57.69
		COPEPODA	1762	627	811	1067	609.2	57.11
		ROTIFERA	401	303	223	309	89.2	28.85
		TOTAL	9516	4265	3640	5807	3227.3	55.58
Nov 1984	527.4	CLADOCERA	13257	12165	10536	11986	1369.3	11.42
		COPEPODA	4707	4512	4067	4429	328.0	7.41
		ROTIFERA	2734	2377	2550	2554	178.5	6.99
		TOTAL	20698	19054	17153	18968	1774.1	9.35

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
Nov 1984	528.0	CLADOCERA	25881	10475	15894	17417	7815.1	44.87
		COPEPODA	8280	4044	4700	5675	2280.0	40.18
		ROTIFERA	7405	2279	4393	4692	2576.1	54.90
		TOTAL	41566	16798	24987	27784	12618.6	45.42
Nov 1984	529.5	CLADOCERA	7425	17953	8423	11267	5811.7	51.58
		COPEPODA	4197	7257	3993	5149	1828.4	35.51
		ROTIFERA	1068	2264	1696	1676	598.3	35.70
		TOTAL	12691	27474	14112	18092	8155.8	45.08
Nov 1984	532.1	CLADOCERA	6797	33813	13172	17927	14121.8	78.77
		COPEPODA	8969	24746	8835	14183	9147.8	64.50
		ROTIFERA	2228	6938	3294	4153	2469.8	59.47
		TOTAL	17994	65497	25301	36264	25578.8	70.53
Feb 1985*	496.5	Cladocera	179	780	219	393	336.0	85.58
		Copepoda	22004	7486	3267	10919	9828.9	90.02
		Rotifera	18439	25259	14808	19502	5306.0	27.21
		Total	40622	33525	18294	30814	11408.3	37.02
Feb 1985*	506.6	Cladocera	1884	631	879	1131	663.5	58.65
		Copepoda	4612	4189	4261	4354	226.3	5.20
		Rotifera	26361	28138	43402	32634	9367.9	28.71
		Total	32857	32958	48542	38119	9026.7	23.68
Feb 1985*	518.0	Cladocera	891	1034	2029	1318	619.9	47.03
		Copepoda	3374	3167	3532	3358	183.0	5.45
		Rotifera	26818	26621	39359	30933	7298.1	23.59
		Total	31083	30822	44920	35608	8065.2	22.65

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
Feb 1985*	529.5	Cladocera	378	395	268	347	68.9	19.87
		Copepoda	6839	1024	6159	4674	3179.2	68.02
		Rotifera	29759	5355	9963	15026	12965.8	86.29
		Total	36976	6774	16390	20047	15429.5	76.97
Feb 1985*	532.1	Cladocera	664	1363	3031	1686	1216.1	72.13
		Copepoda	3512	3906	6354	4591	1539.7	33.54
		Rotifera	7568	7303	31317	15396	13788.6	89.56
		Total	11744	12572	40702	21673	16485.1	76.06
May 1985*	496.5	Cladocera	4331	15414	13435	11060	5910.9	53.44
		Copepoda	17459	58173	19095	31576	23048.5	72.99
		Rotifera	223240	296050	315961	278417	48810.7	17.53
		Total	245030	369637	348491	321053	66681.1	20.77
May 1985*	506.6	Cladocera	5592	3285	7271	5383	2001.2	37.18
		Copepoda	26847	13973	15065	18628	7138.5	38.32
		Rotifera	99636	146871	140643	129050	25662.9	19.89
		Total	132075	164129	162979	153061	18183.5	11.88
May 1985*	518.0	Cladocera	5087	1975	2962	3341	1590.3	47.59
		Copepoda	26028	42069	11787	26628	15149.9	56.89
		Rotifera	119577	104463	51923	91988	35510.4	38.60
		Total	150692	148507	66672	121957	47890.7	39.27
May 1985*	527.4	Cladocera	5894	14090	20610	13531	7373.9	54.49
		Copepoda	54244	25200	34771	38072	14800.7	38.88
		Rotifera	328010	486030	681980	498673	177323.4	35.56
		Total	388148	525320	737361	550276	175939.0	31.97

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
May 1985*	529.5	Cladocera	17690	6200	10580	11490	5798.8	50.47
		Copepoda	69885	55926	46508	57440	11761.8	20.48
		Rotifera	590450	464910	475480	510280	69630.1	13.65
		Total	678025	527036	532568	579210	85621.3	14.78
May 1985*	532.1	Cladocera	14490	25267	21340	20366	5454.2	26.78
		Copepoda	51520	81641	84161	72441	18161.6	25.07
		Rotifera	175230	281910	376850	277997	100867.0	36.28
		Total	241240	388818	482351	370803	121560.8	32.78
Aug 1985	496.5	Cladocera	15796	34683	28571	26350	9637.4	36.57
		Copepoda	14760	23176	18590	18842	4213.7	22.36
		Rotifera	63269	71458	75846	70191	6383.5	9.09
		Total	93825	129317	123007	115383	18934.5	16.41
Aug 1985	506.6	Cladocera	4478	20134	9478	11363	7996.5	70.37
		Copepoda	8373	17259	10969	12200	4569.2	37.45
		Rotifera	3704	6816	4423	4981	1629.3	32.71
		Total	16555	44209	24870	28545	14188.5	49.71
Aug 1985	518.0	Cladocera	26955	9115	6515	14195	11126.7	78.38
		Copepoda	25491	10646	10077	15405	8739.7	56.73
		Rotifera	19428	7676	4693	10599	7790.3	73.50
		Total	71874	27437	21285	40199	27603.6	68.67
Aug 1985	527.4	Cladocera	16045	23143	19114	19434	3559.8	18.32
		Copepoda	27191	34183	67891	43088	21762.4	50.51
		Rotifera	9273	15139	24925	16446	7907.4	48.08
		Total	52509	72465	111930	78968	30239.6	38.29

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
Aug 1985	528.0	Cladocera	25994	21778	39328	29033	9161.3	31.55
		Copepoda	34689	42539	71799	49676	19557.3	39.37
		Rotifera	14024	13556	28428	18669	8454.5	45.29
		Total	74707	77873	139555	97378	36560.4	37.54
Aug 1985	529.5	Cladocera	77462	67530	35341	60111	22018.8	36.63
		Copepoda	103081	73456	64761	80433	20090.1	24.98
		Rotifera	66920	39384	30092	45465	19152.3	42.13
		Total	247463	180370	130194	186009	58837.5	31.63
Aug 1985	532.1	Cladocera	31491	22615	40676	31594	9030.9	28.58
		Copepoda	51133	47495	80847	59825	18296.2	30.58
		Rotifera	20168	28343	67047	38519	25041.5	65.01
		Total	102792	98453	188570	129938	50822.8	39.11
Nov 1985	496.5	Cladocera	1094	2199	1456	1583	563.3	35.59
		Copepoda	2137	2713	2406	2419	288.2	11.92
		Rotifera	2814	4631	3345	3597	934.3	25.98
		Total	6045	9543	7207	7598	1781.5	23.45
Nov 1985	506.6	Cladocera	2626	1035	878	1513	967.1	63.92
		Copepoda	3941	1760	3877	3193	1241.1	38.87
		Rotifera	3683	1030	2865	2526	1358.6	53.78
		Total	10250	3825	7620	7232	3230.1	44.67
Nov 1985	518.0	Cladocera	1062	762	444	756	309.0	40.88
		Copepoda	5244	2143	2030	3139	1823.9	58.10
		Rotifera	10148	6382	6472	7667	2148.8	28.03
		Total	16454	9287	8946	11562	4239.7	36.67

Appendix 5-L. (Continued)

Qtr.	River Mile	Group	Sample 1	Sample 2	Sample 3	Mean	Std.	C.V.
Nov 1985	527.4	Cladocera	5762	8375	4944	6360	1792.0	28.18
		Copepoda	23625	29623	15698	22982	6984.7	30.39
		Rotifera	43200	69862	43539	52200	15296.4	29.30
		Total	72587	107860	64181	81543	23175.8	28.42
Nov 1985	528.0	Cladocera	4893	9129	12859	8960	3985.7	44.48
		Copepoda	13557	25336	19340	19411	5889.8	30.34
		Rotifera	28626	47349	45166	40380	10237.9	25.35
		Total	47076	81814	77365	68752	18903.0	27.49
Nov 1985	529.5	Cladocera	4974	12977	17438	11796	6315.3	53.54
		Copepoda	31972	70701	60981	54551	20149.2	36.94
		Rotifera	33163	95227	63168	63853	31037.7	48.61
		Total	70109	178905	141587	130200	55284.6	42.46
Nov 1985	532.1	Cladocera	9838	29356	14113	17769	10259.8	57.74
		Copepoda	41704	79148	67962	62938	19220.9	30.54
		Rotifera	53116	142509	81837	92487	45638.2	49.35
		Total	104658	251013	163912	173194	73617.7	42.51

*Data not available from all collection sites.

APPENDIX 6-A

MEAN PERIPHYTON DENSITIES (CELLS PER SQUARE CENTIMETER)
AT EACH STATION DURING PREOPERATIONAL MONITORING (1974-1985),
WATTS BAR NUCLEAR PLANT, CHICKAMAUGA RESERVOIR

Appendix 6-A. Mean Periphyton Densities (Cells Per Square Centimeter) at Each Station During Preoperational Monitoring (1974-1985), Watts Bar Nuclear Plant, Chickamauga Reservoir.

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1974	Chlorophyta	Ankistrodesmus	-*	0	0	0	0	0
		Chlamydomonas	-	0	0	0	0	0
		Cladophora	-	0	0	0	0	0
		Closterium	-	0	0	0	0	0
		Cosmarium	-	0	0	33	0	0
		Crucigenia	-	0	0	0	0	0
		Draparnaldia	-	313	197	82	0	50
		Kirchneriella	-	0	0	0	0	0
		Micractinium	-	0	0	0	0	0
		Mougeotia	-	132	0	0	0	0
		Oedogonium	-	0	0	0	0	0
		Pediastrum	-	0	0	0	0	0
		Protococcus	-	0	0	0	0	0
		Protoderma	-	0	0	0	0	0
		Scenedesmus	-	132	99	427	592	723
		Schroederia	-	0	0	0	0	0
		Spirogyra	-	0	0	0	0	0
		Staurastrum	-	0	0	0	0	0
		Stigeoclonium	-	904	362	690	559	641
		Tetraedon	-	0	0	0	0	0
		Tetraspora	-	0	0	66	0	0
		Tetrastrum	-	0	0	0	0	0
		Ulothrix	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1974	Chrysophyta	Achnanthes	-	4240	1348	82	263	1759
		Asterionella	-	0	0	0	0	0
		Bacillaria	-	165	0	66	0	0
		Cocconeis	-	198	0	247	0	723
		Cyclotella	-	0	0	33	0	0
		Cymatopleura	-	0	0	0	0	0
		Cymbella	-	15891	16561	9630	19752	27640
		Diatoma	-	0	0	66	0	280
		Eunotia	-	0	0	0	0	0
		Fragilaria	-	247	395	165	1216	1841
		Gomphonema	-	10649	10057	4914	3484	8923
		Gyrosigma	-	0	17	0	0	0
		Mallomonas	-	0	0	0	0	0
		Melosira	-	16022	24551	13985	14067	17616
		Meridion	-	0	0	0	0	0
		Navicula	-	9958	13738	9367	6869	9219
		Nitzschia	-	0	0	0	0	0
		Pinnularia	-	33	0	33	0	0
		Pleurosigma	-	0	0	0	0	0
		Rhizosolenia	-	0	0	0	0	0
		Rhoicosphenia	-	0	0	0	0	0
		Stephanodiscus	-	0	0	0	0	181
		Surirella	-	0	17	0	0	0
		Synedra	-	2219	2827	1611	723	2465
		Synura	-	0	0	0	0	0
		Tabellaria	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1974	Cyanophyta	Anacystis	-	0	0	0	0	0
		Chroococcus	-	0	0	0	0	0
		Dactylococcopsis	-	115	33	3	0	0
		Lyngbya	-	0	0	0	0	0
		Merismopedia	-	789	0	0	0	0
		Oscill. Spiral	-	0	0	0	0	0
		Oscillatoria	-	0	0	0	0	0
		Phormidium	-	674	904	230	329	263
	Euglenophyta	Euglena	-	0	0	0	0	0
		Trachelomonas	-	0	0	0	0	0
	Pyrrhophyta	Glenodinium	-	0	0	0	0	0
		Gymnodinium	-	0	0	0	0	0
Aug 1974	Chlorophyta	Ankistrodesmus	-	0	0	0	0	0
		Chlamydomonas	-	0	0	0	0	0
		Cladophora	-	0	0	0	0	0
		Closterium	-	0	0	0	0	0
		Cosmarium	-	33	0	99	132	230
		Crucigenia	-	0	0	0	0	0
		Draparnaldia	-	0	0	0	0	0
		Kirchneriella	-	0	0	0	0	0
		Micractinium	-	0	0	0	0	0
		Mougeotia	-	197	312	0	378	888
		Oedogonium	-	0	0	0	0	0
		Pediastrum	-	0	0	0	132	263
		Protococcus	-	0	0	0	0	0
		Protoderma	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1974	Chlorophyta	Scenedesmus	-	164	99	658	690	658
		Spirogyra	-	0	0	0	0	0
		Staurastrum	-	0	0	0	0	0
		Stigeoclonium	-	0	0	82	214	296
		Tetraedon	-	0	0	0	0	0
		Tetraspora	-	0	0	0	0	0
		Tetrastrum	-	0	0	0	0	0
		Ulothrix	-	0	0	0	0	0
	Chrysophyta	Achnanthes	-	1759	756	2827	5834	8365
		Asterionella	-	0	0	33	0	0
		Bacillaria	-	99	0	0	0	822
		Cocconeis	-	33	0	2136	4536	756
		Cyclotella	-	0	0	0	17	0
		Cymatopleura	-	0	0	0	0	0
		Cymbella	-	1923	5226	4487	6984	7724
		Diatoma	-	0	0	0	0	0
		Eunotia	-	0	0	0	0	0
		Fragilaria	-	115	0	0	592	345
		Gomphonema	-	5571	3878	2662	9761	10731
		Gyrosigma	-	0	0	0	0	0
		Melosira	-	0	0	0	0	0
		Meridion	-	0	0	0	0	0
		Navicula	-	8381	5538	10961	7740	9548
		Nitzschia	-	0	0	17	0	0
		Pinnularia	-	50	0	0	0	0
		Pleurosigma	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1974	Chrysophyta	Rhizosolenia	-	0	0	0	0	0
		Rhoicosphenia	-	0	0	0	0	0
		Stephanodiscus	-	0	0	0	0	0
		Surirella	-	0	0	0	0	0
		Synedra	-	1233	887	772	1479	1381
		Synura	-	0	0	0	0	0
		Tabellaria	-	0	0	0	0	0
	Cyanophyta	Anacystis	-	0	0	0	0	0
		Chroococcus	-	0	0	0	0	0
		Dactylococcopsis	-	0	0	0	0	0
		Lyngbya	-	0	0	0	0	0
		Merismopedia	-	0	0	0	0	0
		Oscill. Spiral	-	0	0	0	0	0
		Oscillatoria	-	0	0	0	0	0
		Phormidium	-	0	0	0	0	0
	Euglenophyta	Euglena	-	0	0	0	0	0
		Trachelomonas	-	0	0	0	0	0
	Pyrrhophyta	Glenodinium	-	0	0	0	0	0
		Gymnodinium	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
June 1975	Cyanophyta	Anacystis	-	0	0	0	0	0
		Chroococcus	-	0	0	0	0	0
		Dactylococcopsis	-	0	0	0	0	0
		Lyngbya	-	0	0	62	0	0
		Merismopedia	-	0	0	0	1838	249
		Oscill. Spiral	-	0	0	0	0	0
		Oscillatoria	-	10155	374	716	93	312
		Phormidium	-	0	0	0	0	0
	Euglenophyta	Euglena	-	0	0	0	0	0
		Trachelomonas	-	0	0	0	0	0
	Pyrrhophyta	Glenodinium	-	0	0	0	0	0
		Gymnodinium	-	0	0	0	0	0
May 1976	Chlorophyta	Ankistrodesmus	-	0	0	0	0	0
		Chlamydomonas	-	0	0	0	0	0
		Cladophora	-	0	0	0	0	0
		Closterium	-	17	0	0	0	0
		Cosmarium	-	131	0	0	17	0
		Crucigenia	-	0	0	0	0	0
		Draparnaldia	-	0	0	0	0	0
		Kirchneriella	-	0	0	0	0	0
		Micractinium	-	0	0	0	0	0
		Mougeotia	-	625	329	0	0	559
		Oedogonium	-	0	132	0	559	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1976	Chlorophyta	Pediastrum	-	263	0	0	0	132
		Protococcus	-	0	0	0	0	0
		Protoderma	-	0	0	0	0	0
		Scenedesmus	-	0	132	362	165	625
		Schroederia	-	0	0	0	0	0
		Spirogyra	-	0	0	0	0	0
		Staurastrum	-	0	0	0	33	0
		Stigeoclonium	-	168601	103314	14248	153368	157821
		Tetraedon	-	0	0	0	0	0
		Tetraspora	-	0	0	0	0	0
		Tetrastrum	-	0	0	0	0	0
		Ulothrix	-	7987	4569	0	0	0
	Chrysophyta	Achnanthes	-	5817	6360	690	7822	22480
		Asterionella	-	0	0	0	66	0
		Bacillaria	-	0	0	0	0	0
		Cocconeis	-	165	115	0	0	0
		Cyclotella	-	0	0	0	0	0
		Cymatopleura	-	0	0	0	0	0
		Cymbella	-	91416	112039	26145	150525	152283
		Diatoma	-	230	428	33	5637	8496
		Eunotia	-	0	0	0	0	0
		Fragilaria	-	411	756	460	4799	4420
		Gomphonema	-	22053	23565	6705	20180	35922
		Gyrosigma	-	0	17	17	0	0
		Mallomonas	-	0	0	0	0	0
		Melosira	-	56710	59060	10961	52191	43481
		Meridion	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1976	Chrysophyta	Navicula	-	18980	18010	4289	9630	7707
		Nitzschia	-	411	1233	789	2810	4914
		Pinnularia	-	0	0	0	0	0
		Pleurosigma	-	0	17	66	0	0
		Rhizosolenia	-	0	0	0	0	0
		Rhoicosphenia	-	0	0	0	0	0
		Stephanodiscus	-	181	181	82	444	460
		Surirella	-	0	0	17	0	0
		Synedra	-	13163	11043	1709	10057	14297
		Synura	-	0	0	0	0	0
		Tabellaria	-	0	0	0	66	0
	Cyanophyta	Anacystis	-	0	0	0	0	0
		Chroococcus	-	0	0	0	0	0
		Dactylococcopsis	-	0	165	0	33	0
		Lyngbya	-	247	82	0	329	362
		Merismopedia	-	658	0	0	0	0
		Oscill. Spiral	-	0	0	0	0	0
		Oscillatoria	-	0	0	0	0	0
		Phormidium	-	0	0	0	0	0
	Euglenophyta	Euglena	-	82	0	0	0	0
		Trachelomonas	-	0	0	0	0	0
	Pyrrhophyta	Glenodinium	-	0	0	0	0	0
		Gymnodinium	-	0	0	0	0	17

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1976	Chlorophyta	Ankistrodesmus	-	0	0	0	-	0
		Chlamydomonas	-	0	0	0	-	0
		Cladophora	-	0	0	0	-	0
		Closterium	-	0	0	0	-	0
		Cosmarium	-	17	0	0	-	17
		Crucigenia	-	0	148	0	-	0
		Draparnaldia	-	0	0	0	-	0
		Kirchneriella	-	0	0	0	-	0
		Micractinium	-	0	0	0	-	0
		Mougeotia	-	0	0	460	-	247
		Oedogonium	-	0	0	0	-	0
		Pediastrum	-	312	0	131	-	0
		Protococcus	-	0	0	0	-	0
		Protoderma	-	0	0	0	-	0
		Scenedesmus	-	33	296	526	-	773
		Schroederia	-	0	0	0	-	0
		Spirogyra	-	0	0	0	-	0
		Staurastrum	-	0	0	0	-	0
		Stigeoclonium	-	6064	155652	55707	-	86536
		Tetraedon	-	0	0	0	-	17
		Tetraspora	-	0	0	0	-	0
		Tetrastrum	-	0	0	0	-	0
		Ulothrix	-	0	0	0	-	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1976	Chrysophyta	Achnanthes	-	15431	6754	84366	-	34822
		Asterionella	-	0	0	0	-	0
		Bacillaria	-	0	0	0	-	0
		Cocconeis	-	33	0	394	-	0
		Cyclotella	-	0	0	0	-	0
		Cymatopleura	-	0	0	0	-	0
		Cymbella	-	8283	3944	2892	-	4207
		Diatoma	-	0	33	0	-	0
		Eunotia	-	0	0	0	-	0
		Fragilaria	-	214	329	624	-	2909
		Gomphonema	-	27328	10320	16203	-	39077
		Gyrosigma	-	0	0	0	-	0
		Mallomonas	-	0	0	0	-	0
		Melosira	-	11980	8693	7395	-	2367
		Meridion	-	0	0	0	-	0
		Navicula	-	29776	5998	7066	-	3813
		Nitzschia	-	1265	1282	1742	-	1512
		Pinnularia	-	0	0	0	-	0
		Pleurosigma	-	0	0	0	-	0
		Rhizosolenia	-	0	0	0	-	0
		Rhoicosphenia	-	0	0	0	-	0
		Stephanodiscus	-	378	165	0	-	0
		Surirella	-	0	0	0	-	0
		Synedra	-	4207	3402	11273	-	15891
		Synura	-	0	0	0	-	0
		Tabellaria	-	0	0	0	-	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1976	Cyanophyta	Anacystis	-	0	0	0	-	0
		Chroococcus	-	0	0	0	-	0
		Dactylococcopsis	-	0	197	0	-	0
		Lyngbya	-	428	197	559	-	0
		Merismopedia	-	66	0	0	-	0
		Oscill. Spiral	-	0	0	0	-	0
		Oscillatoria	-	2416	2548	2333	-	0
		Phormidium	-	0	0	0	-	0
	Euglenophyta	Euglena	-	0	0	0	-	0
		Trachelomonas	-	0	17	0	-	0
	Pyrrhophyta	Glenodinium	-	0	0	0	-	0
		Gymnodinium	-	0	0	0	-	0
June 1977	Chlorophyta	Ankistrodesmus	-	-	33	17	66	-
		Chlamydomonas	-	-	0	0	17	-
		Cladophora	-	-	0	0	0	-
		Closterium	-	-	0	0	0	-
		Cosmarium	-	-	0	0	0	-
		Crucigenia	-	-	0	0	0	-
		Draparnaldia	-	-	0	0	0	-
		Kirchneriella	-	-	0	0	17	-
		Micractinium	-	-	0	0	0	-
		Mougeotia	-	-	0	0	0	-
		Oedogonium	-	-	99	0	82	-
		Pediastrum	-	-	0	0	0	-
		Protococcus	-	-	920	543	0	-
		Protoderma	-	-	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
June 1977	Chlorophyta	Scenedesmus	-	-	66	181	296	-
		Schroederia	-	-	0	0	0	-
		Spirogyra	-	-	0	0	0	-
		Staurastrum	-	-	0	0	0	-
		Stigeoclonium	-	-	240084	92188	38897	-
		Tetraedon	-	-	0	0	17	-
		Tetraspora	-	-	0	0	0	-
		Tetrastrum	-	-	0	0	0	-
		Ulothrix	-	-	0	0	0	-
	Chrysophyta	Achnanthes	-	-	279588	232377	206177	-
		Asterionella	-	-	0	0	0	-
		Bacillaria	-	-	0	0	0	-
		Cocconeis	-	-	559	345	477	-
		Cyclotella	-	-	0	66	50	-
		Cymatopleura	-	-	0	0	0	-
		Cymbella	-	-	624	444	1709	-
		Diatoma	-	-	0	33	17	-
		Eunotia	-	-	0	0	0	-
		Fragilaria	-	-	0	0	0	-
		Gomphonema	-	-	45092	39390	48756	-
		Gyrosigma	-	-	0	0	0	-
		Mallomonas	-	-	0	0	0	-
		Melosira	-	-	33	50	50	-
		Meridion	-	-	0	0	0	-
		Navicula	-	-	13146	3763	8003	-
		Nitzschia	-	-	1085	855	395	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
June 1977	Chrysophyta	Pinnularia	-	-	0	0	0	-
		Pleurosigma	-	-	0	0	0	-
		Rhizosolenia	-	-	0	0	0	-
		Rhoicosphenia	-	-	263	17	0	-
		Stephanodiscus	-	-	0	33	0	-
		Surirella	-	-	0	0	0	-
		Synedra	-	-	1808	904	920	-
		Synura	-	-	0	0	0	-
		Tabellaria	-	-	0	0	0	-
	Cyanophyta	Anacystis	-	-	362	0	214	-
		Chroococcus	-	-	0	0	0	-
		Dactylococcopsis	-	-	0	17	33	-
		Lyngbya	-	-	263	378	691	-
		Merismopedia	-	-	0	0	0	-
		Oscill. Spiral	-	-	0	0	0	-
		Oscillatoria	-	-	0	33	50	-
		Phormidium	-	-	0	0	0	-
	Euglenophyta	Euglena	-	-	0	0	0	-
		Trachelomonas	-	-	0	0	0	-
	Pyrrhophyta	Glenodinium	-	-	0	0	0	-
		Gymnodinium	-	-	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1977	Chlorophyta	Ankistrodesmus	0	0	0	0	0	-
		Chlamydomonas	0	0	0	0	0	-
		Cladophora	0	0	0	0	0	-
		Closterium	0	0	0	0	0	-
		Cosmarium	0	0	0	0	0	-
		Crucigenia	0	0	0	0	0	-
		Draparnaldia	0	0	0	0	0	-
		Kirchneriella	0	0	0	0	0	-
		Micractinium	0	0	0	0	0	-
		Mougeotia	934	0	477	181	0	-
		Oedogonium	0	0	99	263	329	-
		Pediastrum	0	0	0	0	0	-
		Protococcus	0	0	0	0	0	-
		Protoderma	0	0	0	0	0	-
		Scenedesmus	0	0	280	0	0	-
		Schroederia	0	0	0	0	0	-
		Spirogyra	0	0	789	0	0	-
		Staurastrum	0	0	0	0	0	-
		Stigeoclonium	12357	22579	26638	8792	30910	-
		Tetraedon	0	0	0	0	0	-
		Tetraspora	0	0	0	0	0	-
		Tetrastrum	0	0	0	0	0	-
		Ulothrix	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1977	Chrysophyta	Achnanthes	147501	9613	168075	24485	30204	-
		Asterionella	0	0	0	0	0	-
		Bacillaria	0	0	0	0	0	-
		Cocconeis	7099	9794	13541	1085	5965	-
		Cyclotella	0	0	0	0	0	-
		Cymatopleura	0	0	0	0	0	-
		Cymbella	427	66	2498	0	231	-
		Diatoma	0	0	0	0	0	-
		Eunotia	0	0	0	0	0	-
		Fragilaria	0	0	0	0	0	-
		Gomphonema	1972	1331	7313	921	1134	-
		Gyrosigma	33	0	17	0	0	-
		Mallomonas	0	0	0	0	0	-
		Melosira	2596	115	11191	657	345	-
		Meridion	0	0	0	0	0	-
		Navicula	953	855	8085	805	608	-
		Nitzschia	427	17	690	164	0	-
		Pinnularia	0	0	0	0	0	-
		Pleurosigma	0	0	0	0	0	-
		Rhizosolenia	0	0	0	0	0	-
		Rhoicosphenia	0	0	0	0	0	-
		Stephanodiscus	0	0	0	0	0	-
		Surirella	0	0	0	0	0	-
		Synedra	33	66	1758	559	0	-
		Synura	0	0	0	0	0	-
		Tabellaria	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1977	Cyanophyta	Anacystis	0	0	0	0	0	-
		Chroococcus	0	0	0	0	0	-
		Dactylococcopsis	0	0	0	0	0	-
		Lyngbya	197	0	0	0	115	-
		Merismopedia	0	66	0	0	0	-
		Oscill. Spiral	0	0	0	0	0	-
		Oscillatoria	0	0	411	0	247	-
		Phormidium	0	0	0	0	0	-
	Euglenophyta	Euglena	0	0	0	0	0	-
		Trachelomonas	0	0	0	0	0	-
	Pyrrhophyta	Glenodinium	0	0	0	0	0	-
		Gymnodinium	0	0	0	0	0	-
Dec 1977	Chlorophyta	Ankistrodesmus	0	0	17	33	-	-
		Chlamydomonas	66	247	0	0	-	-
		Cladophora	0	0	0	0	-	-
		Closterium	0	0	0	0	-	-
		Cosmarium	0	0	0	0	-	-
		Crucigenia	0	0	132	0	-	-
		Draparnaldia	0	0	0	0	-	-
		Kirchneriella	0	0	0	0	-	-
		Micractinium	0	0	0	0	-	-
		Mougeotia	0	17	17	0	-	-
		Oedogonium	0	1693	0	0	-	-
		Pediastrum	0	0	0	0	-	-
		Protococcus	0	0	0	0	-	-
		Protoderma	0	0	0	0	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1977	Chlorophyta	Scenedesmus	0	0	0	526	-	-
		Schroederia	0	0	0	0	-	-
		Spirogyra	0	0	0	0	-	-
		Staurastrum	0	0	0	0	-	-
		Stigeoclonium	0	17353	5341	5390	-	-
		Tetraedon	0	0	0	0	-	-
		Tetraspora	0	0	0	0	-	-
		Tetrastrum	0	0	0	0	-	-
		Ulothrix	0	0	0	0	-	-
	Chrysophyta	Achnanthes	51665	161104	6524	4240	-	-
		Asterionella	0	0	0	0	-	-
		Bacillaria	0	0	0	0	-	-
		Cocconeis	2235	3632	50	296	-	-
		Cyclotella	0	0	0	0	-	-
		Cymatopleura	0	0	0	0	-	-
		Cymbella	624	986	4552	2005	-	-
		Diatoma	0	0	0	0	-	-
		Eunotia	0	0	0	0	-	-
		Fragilaria	0	0	0	0	-	-
		Gomphonema	65896	9564	83463	51008	-	-
		Gyrosigma	0	0	17	0	-	-
		Mallomonas	0	0	0	0	-	-
		Melosira	1282	1003	3845	6179	-	-
		Meridion	0	0	0	0	-	-
		Navicula	37500	8726	38207	47195	-	-
		Nitzschia	887	772	493	394	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1977	Chrysophyta	Pinnularia	66	0	0	0	-	-
		Pleurosigma	0	0	0	0	-	-
		Rhizosolenia	0	0	0	0	-	-
		Rhoicosphenia	0	0	0	0	-	-
		Stephanodiscus	99	132	17	164	-	-
		Surirella	0	0	0	0	-	-
		Synedra	0	1183	2761	4305	-	-
		Synura	6507	0	0	0	-	-
		Tabellaria	0	0	0	0	-	-
	Cyanophyta	Anacystis	0	0	0	0	-	-
		Chroococcus	0	50	0	0	-	-
		Dactylococcopsis	0	0	0	0	-	-
		Lyngbya	0	0	33	723	-	-
		Merismopedia	0	0	0	0	-	-
		Oscill. Spiral	0	0	0	0	-	-
		Oscillatoria	164	83	82	99	-	-
		Phormidium	0	0	0	0	-	-
	Euglenophyta	Euglena	0	0	0	0	-	-
		Trachelomonas	0	0	0	0	-	-
	Pyrrhophyta	Glenodinium	0	0	17	33	-	-
		Gymnodinium	0	0	0	0	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
June 1982	Chlorophyta	Ankistrodesmus	-	0	0	0	0	13
		Chlamydomonas	-	0	0	0	0	0
		Cladophora	-	162253	32863	5144	22239	9919
		Closterium	-	0	0	0	0	0
		Cosmarium	-	0	0	0	0	0
		Crucigenia	-	0	0	0	0	0
		Draparnaldia	-	0	0	0	0	0
		Kirchneriella	-	0	0	0	0	0
		Micractinium	-	0	0	0	0	0
		Mougeotia	-	17887	5028	1727	12967	4661
		Oedogonium	-	3599	0	1448	8230	0
		Pediastrum	-	0	0	0	406	0
		Protococcus	-	0	0	0	0	0
		Protoderma	-	0	0	0	0	0
		Scenedesmus	-	3598	423	863	1016	1194
		Schroederia	-	0	0	0	0	0
		Spirogyra	-	0	0	0	0	0
		Staurastrum	-	0	0	0	0	0
		Stigeoclonium	-	763000	220411	23255	131987	23497
		Tetraedon	-	0	0	0	0	0
		Tetraspora	-	0	0	0	0	0
		Tetrastrum	-	0	0	0	0	0
		Ulothrix	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
June 1982	Chrysophyta	Achnanthes	-	222004	19051	92792	298926	97339
		Asterionella	-	0	0	0	0	0
		Bacillaria	-	0	0	0	0	0
		Cocconeis	-	25613	9473	9259	8306	11723
		Cyclotella	-	0	0	0	0	0
		Cymatopleura	-	0	0	0	0	0
		Cymbella	-	34715	46305	16562	14593	18912
		Diatoma	-	3175	6033	1257	991	0
		Eunotia	-	212	0	0	0	0
		Fragilaria	-	5186	2064	445	0	1232
		Gomphonema	-	26037	17675	10694	6528	13107
		Gyrosigma	-	0	0	0	0	0
		Mallomonas	-	0	0	0	0	0
		Melosira	-	22121	33287	3887	7442	6630
		Meridion	-	0	0	0	0	0
		Navicula	-	33022	14289	9703	6744	11672
		Nitzschia	-	212	4816	191	470	0
		Pinnularia	-	0	0	0	0	0
		Pleurosigma	-	106	741	13	0	0
		Rhizosolenia	-	0	0	0	0	0
		Rhoicosphenia	-	0	0	0	0	0
		Stephanodiscus	-	0	0	0	0	0
		Surirella	-	5715	0	0	0	0
		Synedra	-	14183	26830	5119	11266	1791
		Synura	-	0	0	0	0	0
		Tabellaria	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
June 1982	Cyanophyta	Anacystis	-	0	0	0	0	0
		Chroococcus	-	0	0	0	0	0
		Dactylococcopsis	-	0	0	0	0	0
		Lyngbya	-	222687	97796	17070	61370	17375
		Merismopedia	-	0	3810	711	406	0
		Oscill. Spiral	-	0	98643	0	0	0
		Oscillatoria	-	254863	211680	27535	74986	27637
		Phormidium	-	0	0	0	0	0
	Euglenophyta	Euglena	-	0	0	0	0	0
		Trachelomonas	-	0	0	0	0	0
	Pyrrhophyta	Glenodinium	-	0	0	0	0	0
		Gymnodinium	-	0	0	0	0	0
Aug 1982	Chlorophyta	Arkistrodesmus	0	0	0	0	0	0
		Chlamydomonas	0	0	0	0	0	0
		Cladophora	3404	0	0	0	0	0
		Closterium	0	0	0	0	0	0
		Cosmarium	25	0	0	0	0	13
		Crucigenia	0	0	0	0	0	76
		Draparnaldia	0	0	0	0	0	0
		Kirchneriella	0	0	0	0	0	0
		Micractinium	0	0	2667	0	0	0
		Mougeotia	6198	0	5284	5817	19394	572
		Oedogonium	0	0	0	203	0	203

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1982	Chlorophyta	Pediastrum	0	0	0	0	0	51
		Protococcus	0	0	0	0	0	0
		Protoderma	7951	0	0	0	0	0
		Scenedesmus	825	51	2108	1156	2134	844
		Schroederia	0	0	0	0	0	0
		Spirogyra	0	0	0	0	0	0
		Staurastrum	0	0	0	0	0	0
		Stigeoclonium	28894	51	3937	6058	20207	3447
		Tetraedon	0	0	13	0	0	0
		Tetraspora	0	0	0	0	0	0
		Tetrastrum	0	25	0	0	0	0
		Ulothrix	495	0	0	0	0	0
	Chrysophyta	Achnanthes	80967	108	131034	90506	96361	38711
		Asterionella	0	0	0	0	0	0
		Bacillaria	0	0	0	0	0	0
		Cocconeis	12320	2641	3963	3125	12129	2698
		Cyclotella	0	0	0	0	0	0
		Cymatopleura	0	0	0	0	0	0
		Cymbella	6477	63	3137	9513	18734	6355
		Diatoma	914	216	508	0	0	44
		Eunotia	0	0	0	0	0	0
		Fragilaria	203	0	191	1041	229	76
		Gomphonema	8814	222	5296	4077	8433	1765
		Gyrosigma	0	0	0	0	0	0
		Mallomonas	0	0	0	0	0	0
		Melosira	1651	19	5017	2718	394	165
		Meridion	0	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Aug 1982	Chrysophyta	Navicula	9221	222	1651	1219	4407	3707
		Nitzschia	318	0	1003	813	622	32
		Pinnularia	0	0	0	0	0	0
		Pleurosigma	0	0	0	0	0	0
		Rhizosolenia	0	0	0	0	0	0
		Rhoicosphenia	0	0	0	0	0	0
		Stephanodiscus	0	0	0	0	0	0
		Surirella	0	0	0	0	0	0
		Synedra	5804	38	1867	6884	9691	1809
		Synura	0	0	0	0	0	0
		Tabellaria	0	0	0	0	0	0
	Cyanophyta	Anacystis	0	0	0	0	0	0
		Chroococcus	0	0	0	0	0	0
		Dactylococcopsis	0	0	0	0	0	0
		Lyngbya	69397	0	11481	20626	24588	3860
		Merismopedia	737	0	152	254	660	76
		Oscill. Spiral	0	0	0	0	0	0
		Oscillatoria	27535	0	38102	0	12193	2133
		Phormidium	0	0	0	0	0	0
	Euglenophyta	Euglena	0	0	0	0	0	0
		Trachelomonas	0	0	0	0	0	0
	Pyrrhophyta	Glenodinium	0	0	0	0	0	0
		Gymnodinium	0	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1982	Chlorophyta	Ankistrodesmus	0	-	-	-	-	6
		Chlamydomonas	0	-	-	-	-	0
		Cladophora	0	-	-	-	-	686
		Closterium	0	-	-	-	-	0
		Cosmarium	0	-	-	-	-	0
		Crucigenia	0	-	-	-	-	0
		Draparnaldia	0	-	-	-	-	0
		Kirchneriella	0	-	-	-	-	0
		Micractinium	0	-	-	-	-	0
		Mougeotia	0	-	-	-	-	190
		Oedogonium	0	-	-	-	-	63
		Pediastrum	0	-	-	-	-	51
		Protococcus	0	-	-	-	-	0
		Protoderma	0	-	-	-	-	0
		Scenedesmus	0	-	-	-	-	520
		Schroederia	0	-	-	-	-	0
		Spirogyra	0	-	-	-	-	0
		Staurastrum	0	-	-	-	-	0
		Stigeoclonium	583072	-	-	-	-	1625
		Tetraedon	0	-	-	-	-	0
		Tetraspora	0	-	-	-	-	0
		Tetrastrum	0	-	-	-	-	0
		Ulothrix	3175	-	-	-	-	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1982	Chrysophyta	Achnanthes	832114	-	-	-	-	6132
		Asterionella	0	-	-	-	-	0
		Bacillaria	0	-	-	-	-	0
		Cocconeis	93774	-	-	-	-	1289
		Cyclotella	0	-	-	-	-	0
		Cymatopleura	0	-	-	-	-	0
		Cymbella	22226	-	-	-	-	3123
		Diatoma	741	-	-	-	-	1060
		Eunotia	0	-	-	-	-	0
		Fragilaria	1164	-	-	-	-	406
		Gomphonema	58423	-	-	-	-	6335
		Gyrosigma	847	-	-	-	-	32
		Mallomonas	0	-	-	-	-	0
		Melosira	9737	-	-	-	-	4856
		Meridion	0	-	-	-	-	0
		Navicula	78428	-	-	-	-	10074
		Nitzschia	953	-	-	-	-	2127
		Pinnularia	0	-	-	-	-	0
		Pleurosigma	0	-	-	-	-	0
		Rhizosolenia	0	-	-	-	-	0
		Rhoicosphenia	0	-	-	-	-	0
		Stephanodiscus	0	-	-	-	-	0
		Surirella	0	-	-	-	-	0
		Synedra	7726	-	-	-	-	2876
		Synura	0	-	-	-	-	0
		Tabellaria	0	-	-	-	-	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1982	Cyanophyta	Anacystis	0	-	-	-	-	0
		Chroococcus	0	-	-	-	-	0
		Dactylococcopsis	0	-	-	-	-	0
		Lyngbya	0	-	-	-	-	26154
		Merismopedia	0	-	-	-	-	0
		Oscill. Spiral	0	-	-	-	-	0
		Oscillatoria	0	-	-	-	-	9751
		Phormidium	0	-	-	-	-	0
	Euglenophyta	Euglena	0	-	-	-	-	0
		Trachelomonas	0	-	-	-	-	0
	Pyrrhophyta	Glenodinium	0	-	-	-	-	0
		Gymnodinium	0	-	-	-	-	0
Feb 1983	Chlorophyta	Ankistrodesmus	0	-	0	0	0	-
		Chlamydomonas	0	-	0	0	0	-
		Cladophora	0	-	0	0	0	-
		Closterium	0	-	0	0	0	-
		Cosmarium	0	-	0	0	0	-
		Crucigenia	0	-	0	0	0	-
		Draparnaldia	0	-	0	0	0	-
		Kirchneriella	0	-	0	0	0	-
		Micractinium	0	-	0	0	0	-
		Mougeotia	0	-	0	0	0	-
		Oedogonium	0	-	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Feb 1983	Chlorophyta	Pediastrum	0	-	0	0	0	-
		Protococcus	0	-	0	0	0	-
		Protoderma	0	-	0	0	0	-
		Scenedesmus	0	-	0	0	0	-
		Schroederia	0	-	0	0	0	-
		Spirogyra	0	-	0	0	0	-
		Staurastrum	0	-	0	0	0	-
		Stigeoclonium	0	-	0	0	0	-
		Tetraedon	0	-	0	0	0	-
		Tetraspora	0	-	0	0	0	-
		Tetrastrum	0	-	0	0	0	-
		Ulothrix	0	-	0	0	0	-
	Chrysophyta	Achnanthes	7171	-	935	0	230	-
		Asterionella	0	-	1454	12	0	-
		Bacillaria	0	-	0	0	0	-
		Cocconeis	0	-	623	10	0	-
		Cyclotella	0	-	0	0	0	-
		Cymatopleura	0	-	0	0	0	-
		Cymbella	67658	-	9397	54	129	-
		Diatoma	121805	-	20768	901	2893	-
		Eunotia	0	-	0	0	0	-
		Fragilaria	69737	-	17185	451	976	-
		Gomphonema	213678	-	51503	1121	914	-
		Gyrosigma	0	-	0	0	0	-
		Mallomonas	0	-	0	0	0	-
		Melosira	105176	-	50828	1038	727	-
		Meridion	279881	-	2856	62	135	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Feb 1983	Chrysophyta	Navicula	592292	-	54515	1084	980	-
		Nitzschia	10601	-	4932	60	116	-
		Pinnularia	0	-	0	0	0	-
		Pleurosigma	0	-	0	0	0	-
		Rhizosolenia	0	-	0	0	0	-
		Rhoicosphenia	0	-	0	0	0	-
		Stephanodiscus	0	-	52	4	0	-
		Surirella	10809	-	3427	91	145	-
		Synedra	32530	-	17029	172	1182	-
		Synura	0	-	0	0	0	-
		Tabellaria	13303	-	3063	125	137	-
	Cyanophyta	Anacystis	0	-	0	0	0	-
		Chroococcus	0	-	0	0	0	-
		Dactylococcopsis	0	-	0	0	0	-
		Lyngbya	0	-	0	0	0	-
		Merismopedia	0	-	0	0	0	-
		Oscill. Spiral	0	-	0	0	0	-
		Oscillatoria	0	-	0	0	0	-
		Phormidium	0	-	0	0	0	-
	Euglenophyta	Euglena	0	-	0	0	0	-
		Trachelomonas	0	-	0	0	0	-
	Pyrrhophyta	Glenodinium	0	-	0	0	0	-
		Gymnodinium	0	-	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1983	Chlorophyta	Ankistrodesmus	-	0	5093	-	-	-
		Chlamydomonas	-	0	0	-	-	-
		Cladophora	-	0	12472	-	-	-
		Closterium	-	0	0	-	-	-
		Cosmarium	-	0	0	-	-	-
		Crucigenia	-	0	0	-	-	-
		Draparnaldia	-	0	0	-	-	-
		Kirchneriella	-	0	0	-	-	-
		Micractinium	-	0	0	-	-	-
		Mougeotia	-	0	0	-	-	-
		Oedogonium	-	0	0	-	-	-
		Pediastrum	-	0	0	-	-	-
		Protococcus	-	0	0	-	-	-
		Protoderma	-	0	0	-	-	-
		Scenedesmus	-	10	2494	-	-	-
		Schroederia	-	0	0	-	-	-
		Spirogyra	-	0	0	-	-	-
		Staurastrum	-	0	0	-	-	-
		Stigeoclonium	-	766478	427461	-	-	-
		Tetraedon	-	0	0	-	-	-
		Tetraspora	-	0	0	-	-	-
		Tetrastrum	-	0	0	-	-	-
		Ulothrix	-	0	0	-	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1983	Chrysophyta	Achnanthes	-	461342	633033	-	-	-
		Asterionella	-	0	0	-	-	-
		Bacillaria	-	0	0	-	-	-
		Cocconeis	-	227189	23280	-	-	-
		Cyclotella	-	0	0	-	-	-
		Cymatopleura	-	0	0	-	-	-
		Cymbella	-	208	36271	-	-	-
		Diatoma	-	0	0	-	-	-
		Eunotia	-	0	0	-	-	-
		Fragilaria	-	0	0	-	-	-
		Gomphonema	-	18811	104241	-	-	-
		Gyrosigma	-	0	0	-	-	-
		Mallomonas	-	0	0	-	-	-
		Melosira	-	1247	119727	-	-	-
		Meridion	-	0	0	-	-	-
		Navicula	-	19435	80233	-	-	-
		Nitzschia	-	0	0	-	-	-
		Pinnularia	-	0	0	-	-	-
		Pleurosigma	-	0	0	-	-	-
		Rhizosolenia	-	0	0	-	-	-
		Rhoicosphenia	-	0	0	-	-	-
		Stephanodiscus	-	0	0	-	-	-
		Surirella	-	0	0	-	-	-
		Synedra	-	0	28165	-	-	-
		Synura	-	0	0	-	-	-
		Tabellaria	-	0	0	-	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1983	Cyanophyta	Anacystis	-	0	0	-	-	-
		Chroococcus	-	0	0	-	-	-
		Dactylococcopsis	-	0	0	-	-	-
		Lyngbya	-	0	75661	-	-	-
		Merismopedia	-	831	0	-	-	-
		Oscill. Spiral	-	0	0	-	-	-
		Oscillatoria	-	145501	246104	-	-	-
		Phormidium	-	0	0	-	-	-
	Euglenophyta	Euglena	-	0	0	-	-	-
		Trachelomonas	-	0	0	-	-	-
	Pyrrhophyta	Glenodinium	-	0	0	-	-	-
		Gymnodinium	-	0	0	-	-	-
Sep 1983	Chlorophyta	Ankistrodesmus	-	0	-	-	-	675
		Chlamydomonas	-	0	-	-	-	0
		Cladophora	-	0	-	-	-	0
		Closterium	-	0	-	-	-	0
		Cosmarium	-	0	-	-	-	0
		Crucigenia	-	0	-	-	-	0
		Draparnaldia	-	0	-	-	-	0
		Kirchneriella	-	0	-	-	-	0
		Micractinium	-	0	-	-	-	0
		Mougeotia	-	0	-	-	-	0
		Oedogonium	-	0	-	-	-	0
		Pediastrum	-	0	-	-	-	166
		Protococcus	-	187	-	-	-	0
		Protoderma	-	0	-	-	-	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1983	Chlorophyta	Scenedesmus	-	602	-	-	-	2616
		Schroederia	-	0	-	-	-	0
		Spirogyra	-	0	-	-	-	0
		Staurastrum	-	0	-	-	-	0
		Stigeoclonium	-	12408	-	-	-	1589
		Tetraedon	-	0	-	-	-	0
		Tetraspora	-	0	-	-	-	0
		Tetrastrum	-	0	-	-	-	0
		Ulothrix	-	0	-	-	-	0
	Chrysophyta	Achnanthes	-	2617	-	-	-	22979
		Asterionella	-	0	-	-	-	0
		Bacillaria	-	0	-	-	-	0
		Cocconeis	-	11432	-	-	-	1412
		Cyclotella	-	0	-	-	-	0
		Cymatopleura	-	0	-	-	-	0
		Cymbella	-	530	-	-	-	2637
		Diatoma	-	42	-	-	-	62
		Eunotia	-	0	-	-	-	0
		Fragilaria	-	0	-	-	-	0
		Gomphonema	-	73	-	-	-	7912
		Gyrosigma	-	0	-	-	-	0
		Mallomonas	-	0	-	-	-	0
		Melosira	-	665	-	-	-	498
		Meridion	-	0	-	-	-	0
		Navicula	-	228	-	-	-	2357
		Nitzschia	-	0	-	-	-	3001

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1983	Chrysophyta	Pinnularia	-	0	-	-	-	0
		Pleurosigma	-	0	-	-	-	0
		Rhizosolenia	-	0	-	-	-	0
		Rhoicosphenia	-	0	-	-	-	0
		Stephanodiscus	-	93	-	-	-	83
		Surirella	-	0	-	-	-	0
		Synedra	-	260	-	-	-	1672
		Synura	-	0	-	-	-	0
		Tabellaria	-	0	-	-	-	0
	Cyanophyta	Anacystis	-	0	-	-	-	0
		Chroococcus	-	0	-	-	-	0
		Dactylococcopsis	-	0	-	-	-	0
		Lyngbya	-	0	-	-	-	0
		Merismopedia	-	0	-	-	-	0
		Oscill. Spiral	-	0	-	-	-	0
		Oscillatoria	-	0	-	-	-	15534
		Phormidium	-	0	-	-	-	0
	Euglenophyta	Euglena	-	10	-	-	-	0
		Trachelomonas	-	0	-	-	-	0
	Pyrrhophyta	Glenodinium	-	0	-	-	-	0
		Gymnodinium	-	0	-	-	-	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Nov 1983	Chlorophyta	Ankistrodesmus	0	-	0	0	0	0
		Chlamydomonas	0	-	0	0	0	0
		Cladophora	0	-	0	0	0	0
		Closterium	0	-	0	0	0	0
		Cosmarium	0	-	0	0	0	0
		Crucigenia	0	-	0	0	0	0
		Draparnaldia	0	-	0	0	0	0
		Kirchneriella	0	-	0	0	0	0
		Micractinium	0	-	0	0	0	0
		Mougeotia	0	-	426	197	229	0
		Oedogonium	1547	-	499	0	0	0
		Pediastrum	0	-	0	0	0	0
		Protococcus	0	-	0	0	0	0
		Protoderma	0	-	0	0	0	0
		Scenedesmus	0	-	561	415	311	249
		Schroederia	0	-	0	0	0	0
		Spirogyra	0	-	0	0	0	0
		Staurastrum	0	-	3042	3634	0	0
		Stigeoclonium	23104	-	5794	5493	11256	9564
		Tetraedon	0	-	0	0	0	0
		Tetraspora	0	-	0	0	0	0
		Tetrastrum	0	-	0	0	0	0
		Ulothrix	0	-	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Nov 1983	Chrysophyta	Achnanthes	27268	-	62635	49541	43944	38607
		Asterionella	0	-	0	0	0	0
		Bacillaria	0	-	0	0	0	0
		Cocconeis	6853	-	1661	4880	9314	5483
		Cyclotella	0	-	0	0	0	0
		Cymatopleura	0	-	0	0	0	0
		Cymbella	2201	-	3261	4891	6023	7964
		Diatoma	0	-	62	4849	789	395
		Eunotia	0	-	0	0	0	0
		Fragilaria	0	-	0	0	0	0
		Gomphonema	0	-	7829	12097	10000	9833
		Gyrosigma	0	-	0	0	0	0
		Mallomonas	0	-	0	0	0	0
		Melosira	8722	-	6324	6677	5971	6303
		Meridion	0	-	0	0	0	0
		Navicula	6511	-	7622	7476	9667	5098
		Nitzschia	0	-	560	0	62	332
		Pinnularia	0	-	0	0	0	0
		Pleurosigma	0	-	0	0	0	0
		Rhizosolenia	0	-	0	0	0	0
		Rhoicosphenia	0	-	0	0	0	0
		Stephanodiscus	0	-	0	21	0	0
		Surirella	0	-	0	0	0	0
		Synedra	0	-	1641	893	1308	1059
		Synura	0	-	0	0	0	0
		Tabellaria	0	-	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Nov 1983	Cyanophyta	Anacystis	0	-	0	0	0	0
		Chroococcus	0	-	0	0	0	0
		Dactylococcopsis	0	-	0	0	0	0
		Lyngbya	0	-	0	0	5316	0
		Merismopedia	0	-	0	0	0	0
		Oscill. Spiral	0	-	0	0	0	0
		Oscillatoria	0	-	0	0	0	0
		Phormidium	0	-	0	0	0	0
	Euglenophyta	Euglena	0	-	0	0	0	0
		Trachelomonas	0	-	0	0	0	0
	Pyrrhophyta	Glenodinium	0	-	0	0	0	0
		Gymnodinium	0	-	0	0	0	0
Feb 1984	Chlorophyta	Ankistrodesmus	-	0	187	62	0	37
		Chlamydomonas	-	0	0	0	0	0
		Cladophora	-	0	0	0	0	0
		Closterium	-	0	0	0	0	0
		Cosmarium	-	0	0	0	0	0
		Crucigenia	-	0	0	0	0	0
		Draparnaldia	-	0	0	0	0	0
		Kirchneriella	-	0	0	0	0	0
		Micractinium	-	0	0	0	0	0
		Mougeotia	-	0	0	0	0	0
		Oedogonium	-	0	0	0	0	0
		Pediastrum	-	0	0	0	0	0
		Protococcus	-	0	0	0	0	0
		Protoderma	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Feb 1984	Chlorophyta	Scenedesmus	-	0	0	0	0	0
		Schroederia	-	0	0	0	0	0
		Spirogyra	-	0	0	0	0	0
		Staurastrum	-	0	0	0	0	0
		Stigeoclonium	-	0	0	0	0	0
		Tetraedon	-	0	0	0	0	0
		Tetraspora	-	0	0	0	0	0
		Tetrastrum	-	0	0	0	0	0
		Ulothrix	-	0	0	0	0	0
	Chrysophyta	Achnanthes	-	3076	7961	3222	8875	4847
		Asterionella	-	0	270	0	1559	0
		Bacillaria	-	0	0	0	0	0
		Cocconeis	-	3367	416	1621	6007	822
		Cyclotella	-	0	0	0	0	0
		Cymatopleura	-	0	0	353	0	0
		Cymbella	-	29246	7524	31657	1517	8268
		Diatoma	-	14841	68365	57577	142528	8268
		Eunotia	-	0	0	0	0	0
		Fragilaria	-	0	0	1642	1684	1377
		Gomphonema	-	70444	22407	15298	29246	1751
		Gyrosigma	-	0	0	0	0	0
		Mallomonas	-	0	0	0	0	0
		Melosira	-	19352	13407	24714	30098	4274
		Meridion	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Feb 1984	Chrysophyta	Navicula	-	6631	8917	14114	13262	2442
		Nitzschia	-	2141	1455	1621	2391	716
		Pinnularia	-	0	0	0	0	0
		Pleurosigma	-	0	0	0	0	0
		Rhizosolenia	-	0	0	0	0	0
		Rhoicosphenia	-	0	0	0	0	0
		Stephanodiscus	-	0	0	0	0	0
		Surirella	-	0	146	437	0	0
		Synedra	-	45209	27812	29225	40428	9576
		Synura	-	0	0	0	0	0
		Tabellaria	-	2660	2370	2245	2931	0
	Cyanophyta	Anacystis	-	0	0	0	0	0
		Chroococcus	-	0	0	0	0	0
		Dactylococcopsis	-	0	0	0	0	0
		Lyngbya	-	0	0	0	0	0
		Merismopedia	-	0	0	0	0	0
		Oscill. Spiral	-	0	0	0	0	0
		Oscillatoria	-	998	0	0	0	0
		Phormidium	-	0	0	0	0	0
	Euglenophyta	Euglena	-	0	0	0	0	0
		Trachelomonas	-	0	0	0	0	0
	Pyrrhophyta	Glenodinium	-	0	0	0	0	0
		Gymnodinium	-	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
July 1984	Chlorophyta	Ankistrodesmus	0	0	0	-	-	-
		Chlamydomonas	0	0	0	-	-	-
		Cladophora	0	0	0	-	-	-
		Closterium	0	0	0	-	-	-
		Cosmarium	0	0	0	-	-	-
		Crucigenia	0	0	0	-	-	-
		Draparnaldia	0	0	0	-	-	-
		Kirchneriella	0	0	0	-	-	-
		Micractinium	0	0	0	-	-	-
		Mougeotia	0	2648	0	-	-	-
		Oedogonium	0	3219	0	-	-	-
		Pediastrum	0	0	0	-	-	-
		Protococcus	0	0	0	-	-	-
		Protoderma	0	0	0	-	-	-
		Scenedesmus	0	623	935	-	-	-
		Schroederia	0	0	0	-	-	-
		Spirogyra	0	0	0	-	-	-
		Staurastrum	0	0	0	-	-	-
		Stigeoclonium	347595	365352	339496	-	-	-
		Tetraedon	0	0	0	-	-	-
		Tetraspora	0	0	0	-	-	-
		Tetrastrum	0	0	0	-	-	-
		Ulothrix	0	10903	0	-	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
July 1984	Chrysophyta	Achnanthes	344688	318936	237216	-	-	-
		Asterionella	0	0	0	-	-	-
		Bacillaria	0	0	0	-	-	-
		Cocconeis	571	5504	3271	-	-	-
		Cyclotella	0	0	0	-	-	-
		Cymatopleura	0	0	0	-	-	-
		Cymbella	312	3011	2492	-	-	-
		Diatoma	0	0	0	-	-	-
		Eunotia	0	0	0	-	-	-
		Fragilaria	0	0	0	-	-	-
		Gomphonema	1350	5244	3219	-	-	-
		Gyrosigma	0	0	0	-	-	-
		Mallomonas	0	0	0	-	-	-
		Melosira	727	2752	6801	-	-	-
		Meridion	0	0	0	-	-	-
		Navicula	935	2285	8826	-	-	-
		Nitzschia	0	0	0	-	-	-
		Pinnularia	0	0	0	-	-	-
		Pleurosigma	0	0	0	-	-	-
		Rhizosolenia	0	0	0	-	-	-
		Rhoicosphenia	0	0	0	-	-	-
		Stephanodiscus	0	0	0	-	-	-
		Surirella	0	0	0	-	-	-
		Synedra	0	1713	2700	-	-	-
		Synura	0	0	0	-	-	-
		Tabellaria	0	0	0	-	-	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
July 1984	Cyanophyta	Anacystis	0	0	0	-	-	-
		Chroococcus	0	0	0	-	-	-
		Dactylococcopsis	0	0	0	-	-	-
		Lyngbya	46519	88054	77255	-	-	-
		Merismopedia	0	0	0	-	-	-
		Oscill. Spiral	0	0	0	-	-	-
		Oscillatoria	0	0	0	-	-	-
		Phormidium	0	0	0	-	-	-
	Euglenophyta	Euglena	0	0	0	-	-	-
		Trachelomonas	0	0	0	-	-	-
	Pyrrhophyta	Glenodinium	0	0	0	-	-	-
		Gymnodinium	0	0	0	-	-	-
Sep 1984	Chlorophyta	Ankistrodesmus	0	0	0	0	0	-
		Chlamydomonas	0	0	0	0	0	-
		Cladophora	0	0	0	0	0	-
		Closterium	0	0	0	0	0	-
		Cosmarium	0	0	0	0	0	-
		Crucigenia	0	0	0	0	0	-
		Draparnaldia	0	0	0	0	0	-
		Kirchneriella	0	0	0	0	0	-
		Micractinium	0	0	0	0	0	-
		Mougeotia	0	0	0	0	0	-
		Oedogonium	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1984	Chlorophyta	Pediastrum	0	0	0	0	0	-
		Protococcus	0	0	0	0	0	-
		Protoderma	0	0	0	0	0	-
		Scenedesmus	623	727	727	1713	1142	-
		Schroederia	0	0	0	0	0	-
		Spirogyra	0	0	0	0	0	-
		Staurastrum	0	0	21442	0	0	-
		Stigeoclonium	136442	181611	52023	53580	45636	-
		Tetraedon	0	0	0	0	0	-
		Tetraspora	0	0	0	0	0	-
		Tetrastrum	0	0	0	208	0	-
		Ulothrix	0	0	0	0	0	-
	Chrysophyta	Achnanthes	151914	241785	95686	78709	84004	-
		Asterionella	0	0	0	0	0	-
		Bacillaria	0	0	0	0	0	-
		Cocconeis	28815	16821	29178	32657	29438	-
		Cyclotella	0	0	0	0	0	-
		Cymatopleura	0	0	0	0	0	-
		Cymbella	2544	987	2233	5036	2907	-
		Diatoma	0	0	0	208	0	-
		Eutonia	0	0	0	52	0	-
		Fragilaria	0	0	0	0	0	-
		Gomphonema	3167	16614	4725	4829	7113	-
		Gyrosigma	0	0	0	0	0	-
		Mallomonas	0	0	0	0	0	-
		Melosira	2025	1090	1921	3790	4673	-
		Meridion	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1984	Chrysophyta	Navicula	17808	9657	5400	2959	3894	-
		Nitzschia	0	0	0	779	1558	-
		Pinnularia	0	0	0	0	0	-
		Pleurosigma	0	0	0	0	0	-
		Rhizosolenia	0	104	0	0	0	-
		Rholcosphenia	0	0	0	0	0	-
		Stephanodiscus	0	0	0	0	0	-
		Surirella	0	0	0	0	0	-
		Synedra	2907	3219	2388	4673	1402	-
		Synura	0	0	0	0	1194	-
		Tabellaria	0	0	0	0	0	-
	Cyanophyta	Anacystis	0	0	0	0	0	-
		Chroococcus	0	0	0	0	0	-
		Dactylococcopsis	0	0	0	0	0	-
		Lyngbya	37797	98438	30321	44027	48180	-
		Merismopedia	1558	2284	623	1142	2596	-
		Oscill. Spiral	0	0	0	0	0	-
		Oscillatoria	0	935	10384	2907	14122	-
		Phormidium	0	0	0	0	0	-
	Euglenophyta	Euglena	0	0	0	0	0	-
		Trachelomonas	0	0	0	0	0	-
	Pyrrhophyta	Glenodinium	0	0	0	0	0	-
		Gymnodinium	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1984	Chlorophyta	Ankistrodesmus	0	0	-	0	0	0
		Chlamydomonas	0	0	-	0	0	0
		Cladophora	0	0	-	0	0	0
		Closterium	0	0	-	0	0	0
		Cosmarium	0	0	-	0	0	0
		Crucigenia	0	0	-	0	0	0
		Draparnaldia	0	0	-	0	0	0
		Kirchneriella	0	0	-	0	0	0
		Micractinium	0	0	-	0	0	0
		Mougeotia	6452	675	-	519	6178	5815
		Oedogonium	0	0	-	0	0	0
		Pediastrum	0	0	-	0	0	0
		Protococcus	0	0	-	0	0	0
		Protoderma	0	0	-	0	0	0
		Scenedesmus	632	415	-	0	1142	519
		Schroederia	0	0	-	0	0	0
		Spirogyra	0	0	-	0	0	0
		Staurastrum	0	0	-	0	0	0
		Stigeoclonium	88365	31892	-	60381	167646	166607
		Tetraedon	0	0	-	0	0	0
		Tetraspora	0	0	-	0	0	0
		Tetrastrum	0	0	-	0	0	0
		Ulothrix	0	0	-	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1984	Chrysophyta	Achnanthes	158508	60433	-	64327	31619	80266
		Asterionella	0	0	-	0	0	0
		Bacillaria	0	0	-	0	0	0
		Cocconeis	45377	40496	-	13135	32553	14122
		Cyclotella	0	0	-	0	0	0
		Cymatopleura	0	0	-	0	0	0
		Cymbella	4153	1817	-	1402	4257	6697
		Diatoma	0	0	-	0	0	0
		Eunotia	0	0	-	0	0	0
		Fragilaria	0	0	-	0	0	0
		Gomphonema	46935	17548	-	20404	27465	47713
		Gyrosigma	0	0	-	0	0	0
		Mallomonas	0	0	-	0	0	0
		Melosira	4101	1091	-	2700	3375	3479
		Meridion	0	0	-	0	0	0
		Navicula	52542	20352	-	17393	28348	11422
		Nitzschia	3011	1402	-	1091	2648	1609
		Pinnularia	0	0	-	0	0	0
		Pleurosigma	0	0	-	0	0	0
		Rhizosolenia	0	0	-	0	0	0
		Rhoicosphenia	0	0	-	0	0	0
		Stephanodiscus	0	156	-	208	1038	0
		Surirella	0	0	-	0	0	0
		Synedra	7788	8203	-	4828	5088	9865
		Synura	0	0	-	0	0	0
		Tabellaria	0	0	-	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1984	Cyanophyta	Anacystis	0	0	-	0	0	0
		Chroococcus	0	0	-	0	0	0
		Dactylococcopsis	0	0	-	0	0	0
		Lyngbya	0	0	-	0	46104	53995
		Merismopedia	0	0	-	0	831	623
		Oscill. Spiral	0	0	-	0	0	0
		Oscillatoria	0	0	-	0	0	0
		Phormidium	0	0	-	0	0	0
	Euglenophyta	Euglena	0	0	-	0	0	0
		Trachelomonas	0	0	-	0	0	0
	Pyrrhophyta	Glenodinium	0	0	-	0	0	0
		Gymnodinium	0	0	-	0	0	0
Mar 1985	Chlorophyta	Ankistrodesmus	0	0	-	0	0	0
		Chlamydomonas	0	0	-	0	0	0
		Cladophora	0	0	-	0	0	0
		Closterium	0	0	-	0	0	0
		Cosmarium	0	0	-	0	0	0
		Crucigenia	0	0	-	-	0	0
		Draparnaldia	0	0	-	0	0	0
		Kirchneriella	0	0	-	0	0	0
		Micractinium	0	0	-	0	0	0
		Mougeotia	0	0	-	-	0	0
		Oedogonium	0	0	-	-	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Mar 1985	Chlorophyta	Pediastrum	0	0	-	-	0	0
		Protococcus	0	0	-	-	0	0
		Protoderma	0	0	-	-	0	0
		Scenedesmus	191	0	-	-	0	0
		Schroederia	0	0	-	-	0	0
		Spirogyra	0	0	-	-	0	0
		Staurastrum	0	0	-	-	0	0
		Stigeoclonium	798	0	-	-	0	0
		Tetraedon	0	0	-	-	0	0
		Tetraspora	0	0	-	-	0	0
		Tetrastrum	0	0	-	-	0	0
		Ulothrix	0	0	-	-	0	0
	Chrysophyta	Achnanthes	0	0	-	-	137	112
		Asterionella	0	0	-	-	0	0
		Bacillaria	0	0	-	-	0	0
		Cocconeis	320	943	-	-	444	0
		Cyclotella	0	0	-	-	0	0
		Cymatopleura	0	0	-	-	0	0
		Cymbella	693	469	-	-	386	166
		Diatoma	6363	8623	-	-	13141	4249
		Eunotia	0	0	-	-	0	0
		Fragilaria	1877	2538	-	-	2621	320
		Gomphonema	5894	4548	-	-	3851	278
		Gyrosigma	0	0	-	-	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Mar 1985	Chrysophyta	Mallomonas	0	0	-	-	0	170
		Melosira	4681	6882	-	-	2729	473
		Meridion	0	0	-	-	0	0
		Navicula	1209	1433	-	-	1570	324
		Nitzschia	0	225	-	-	8	0
		Pinnularia	0	0	-	-	0	0
		Pleurosigma	54	0	-	-	0	0
		Rhizosolenia	0	0	-	-	0	0
		Rhoicosphenia	0	0	-	-	0	0
		Stephanodiscus	0	0	-	-	0	0
		Surirella	0	0	-	-	0	0
		Synedra	1777	2143	-	-	2359	739
		Synura	0	0	-	-	0	0
		Tabellaria	0	0	-	-	0	0
	Cyanophyta	Anacystis	0	0	-	-	0	0
		Chroococcus	0	0	-	-	0	0
		Dactylococcopsis	0	0	-	-	0	0
		Lyngbya	0	0	-	-	0	0
		Merismopedia	0	0	-	-	0	0
		Oscill. Spiral	0	0	-	-	0	0
		Oscillatoria	1528	0	-	-	0	0
		Phormidium	0	0	-	-	0	0
	Euglenophyta	Euglena	50	0	-	-	0	0
		Trachelomonas	0	0	-	-	0	0
	Pyrrhophyta	Glenodinium	0	0	-	-	0	0
		Gymnodinium	0	0	-	-	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1985	Chlorophyta	Ankistrodesmus	0	0	0	0	0	0
		Chlamydomonas	0	0	0	0	0	0
		Cladophora	0	0	0	0	0	0
		Closterium	0	0	0	0	0	0
		Cosmarium	0	0	0	0	0	0
		Crucigenia	0	0	0	0	0	0
		Draparnaldia	0	0	0	0	0	0
		Kirchneriella	0	0	0	0	0	0
		Micractinium	0	0	0	0	0	0
		Mougeotia	8878	0	8816	3987	5202	8006
		Oedogonium	4361	0	0	6262	0	4579
		Pediastrum	0	0	0	997	1246	0
		Protococcus	0	0	0	0	0	0
		Protoderma	0	0	0	0	0	0
		Scenedesmus	0	62	249	1495	0	0
		Schroederia	0	0	0	623	0	0
		Spirogyra	0	0	0	0	0	0
		Staurastrum	38409	0	0	33737	0	36509
		Stigeoclonium	68657	98999	103453	64701	96226	62271
		Tetraedon	0	0	0	0	0	0
		Tetraspora	0	0	0	0	0	0
		Tetrastrum	0	0	0	0	0	0
		Ulothrix	0	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1985	Chrysophyta	Achnanthes	48129	52521	21339	39219	34235	36540
		Asterionella	0	0	0	0	0	0
		Bacillaria	0	0	0	0	0	0
		Cocconeis	4330	2990	4423	1744	2087	4330
		Cyclotella	0	0	0	0	0	0
		Cymatopleura	0	0	0	0	0	0
		Cymbella	20622	5856	18847	17849	15264	15544
		Diatoma	3209	810	3458	2087	3427	3208
		Eunotia	0	0	0	0	0	0
		Fragilaria	4049	1527	3146	3333	3022	2866
		Gomphonema	20529	0	14672	16822	13021	19345
		Gyrosigma	0	0	0	0	0	0
		Mallomonas	0	0	0	0	0	0
		Melosira	9844	4112	16292	7383	18628	12491
		Meridion	0	0	0	0	0	0
		Navicula	4922	2056	6698	3364	5763	5607
		Nitzschia	0	0	0	1215	218	1433
		Pinnularia	0	0	0	0	0	0
		Pleurosigma	0	0	0	0	0	0
		Rhizosolenia	0	0	0	0	0	0
		Rhoicosphenia	0	0	0	0	0	0
		Stephanodiscus	0	0	0	0	0	0
		Surirella	0	0	0	0	0	0
		Synedra	4704	3364	4112	2741	3022	4735
		Synura	0	0	0	0	0	0
		Tabellaria	0	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
May 1985	Cyanophyta	Anacystis	0	0	0	0	0	0
		Chroococcus	0	0	0	0	0	0
		Dactylococcopsis	0	0	0	0	0	0
		Lyngbya	0	0	0	0	0	0
		Merismopedia	0	0	0	312	0	0
		Oscill. Spiral	0	0	0	0	0	0
		Oscillatoria	0	0	53331	57069	54079	0
		Phormidium	0	0	0	0	0	0
	Euglenophyta	Euglena	0	0	0	0	0	0
		Trachelomonas	0	0	0	0	0	0
	Pyrrhophyta	Glenodinium	0	0	0	0	0	0
		Gymnodinium	0	0	0	0	0	0
Sep 1985	Chlorophyta	Ankistrodesmus	0	0	0	0	0	-
		Chlamydomonas	0	0	0	0	0	-
		Cladophora	0	0	0	0	0	-
		Closterium	0	0	0	0	0	-
		Cosmarium	0	0	0	0	0	-
		Crucigenia	0	0	249	125	0	-
		Draparnaldia	0	0	0	0	0	-
		Kirchneriella	0	0	0	0	0	-
		Micractinium	0	0	0	0	0	-
		Mougeotia	0	0	7726	5015	6884	-
		Oedogonium	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1985	Chlorophyta	Pediastrum	0	0	0	218	0	-
		Protococcus	0	0	0	0	0	-
		Protoderma	0	0	0	0	0	-
		Scenedesmus	1931	1184	2523	3271	2928	-
		Schroederia	0	0	0	0	0	-
		Spirogyra	0	0	0	0	0	-
		Staurastrum	0	0	0	0	0	-
		Stigeoclonium	96351	6885	59499	40279	70339	-
		Tetraedon	0	0	0	0	0	-
		Tetraspora	0	0	0	0	0	-
		Tetrastrum	0	0	0	0	0	-
		Ulothrix	0	0	0	0	0	-
	Chrysophyta	Achnanthes	29874	22117	112611	146971	133732	-
		Asterionella	0	0	0	0	0	-
		Bacillaria	0	0	0	0	0	-
		Cocconeis	38067	11557	20716	18037	4579	-
		Cyclotella	0	0	0	0	0	-
		Cymatopleura	0	0	0	0	0	-
		Cymbella	8255	4766	20965	17631	47443	-
		Diatoma	2555	1807	3988	1807	0	-
		Eunotia	0	0	0	0	0	-
		Fragilaria	7788	3489	9968	12616	9719	-
		Gomphonema	13270	7726	19532	18161	19625	-
		Gyrosigma	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Sep 1985	Chrysophyta	Mallomonas	0	0	0	0	0	-
		Melosira	3084	1994	3177	2866	4797	-
		Meridion	0	0	0	0	0	-
		Navicula	3832	1651	5701	4299	6105	-
		Nitzschia	1153	62	1340	1464	1090	-
		Pinnularia	0	0	0	0	0	-
		Pleurosigma	0	0	0	0	0	-
		Rhizosolenia	0	0	0	0	0	-
		Rhoicosphenia	0	0	0	0	0	-
		Stephanodiscus	0	0	0	0	0	-
		Surirella	0	0	0	0	0	-
		Synedra	4112	1527	3115	2897	4829	-
		Synura	0	0	0	0	0	-
		Tabellaria	0	0	0	0	0	-
	Cyanophyta	Anacystis	0	0	0	0	0	-
		Chroococcus	0	0	0	0	0	-
		Dactylococcopsis	0	0	0	0	0	-
		Lyngbya	0	0	0	0	0	-
		Merismopedia	0	0	125	0	0	-
		Oscill. Spiral	0	0	0	0	0	-
		Oscillatoria	40372	0	56571	52833	45356	-
		Phormidium	0	0	0	0	0	-
	Euglenophyta	Euglena	0	0	0	0	0	-
		Trachelomonas	0	0	0	0	0	-
	Pyrrhophyta	Glenodinium	0	0	0	0	0	-
		Gymnodinium	0	0	0	0	0	-

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1985	Chlorophyta	Ankistrodesmus	0	0	0	0	0	0
		Chlamydomonas	0	0	0	0	0	0
		Cladophora	0	0	0	0	0	0
		Closterium	0	0	0	0	0	0
		Cosmarium	0	0	0	0	0	0
		Crucigenia	0	0	0	0	0	0
		Draparnaldia	0	0	0	0	0	0
		Kirchneriella	0	0	0	0	0	0
		Micractinium	0	0	0	0	0	0
		Mougeotia	0	0	0	0	0	0
		Oedogonium	0	0	0	0	0	0
		Pediastrum	0	0	0	0	0	0
		Protococcus	0	0	0	0	0	0
		Protoderma	0	0	0	0	0	0
		Scenedesmus	0	0	1121	1121	1059	810
		Schroederia	0	0	0	0	0	0
		Spirogyra	0	0	0	0	0	0
		Staurastrum	0	0	0	0	0	0
		Stigeoclonium	57162	70869	57910	53580	44204	58969
		Tetraedon	0	0	0	0	0	0
		Tetraspora	0	0	0	0	0	0
		Tetrastrum	0	0	0	0	0	0
		Ulothrix	0	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1985	Chrysophyta	Achnanthes	17445	21432	56633	14703	13738	29064
		Asterionella	0	0	0	0	0	0
		Bacillaria	0	0	0	0	0	0
		Cocconeis	29936	21401	5421	27756	28285	6822
		Cyclotella	0	0	0	0	0	0
		Cymatopleura	0	0	0	0	0	0
		Cymbella	0	280	4205	2305	3925	4112
		Diatoma	0	0	0	0	0	0
		Eunotia	0	0	0	0	0	0
		Fragilaria	7694	0	0	0	0	0
		Gomphonema	16977	9283	17507	11059	15015	23613
		Gyrosigma	0	0	0	0	0	0
		Mallomonas	0	0	0	0	0	0
		Melosira	0	0	4268	1215	0	0
		Meridion	0	0	0	0	0	0
		Navicula	4922	9034	16105	5202	3987	5078
		Nitzschia	2804	0	125	0	0	0
		Pinnularia	0	0	0	0	0	0
		Pleurosigma	0	0	0	0	0	0
		Rhizosolenia	0	0	0	0	0	0
		Rhoicosphenia	0	0	0	0	0	0
		Stephanodiscus	0	0	0	0	0	0
		Surirella	0	0	0	0	0	0
		Synedra	0	0	3177	2461	2835	3208
		Synura	0	0	0	0	0	0
		Tabellaria	0	0	0	0	0	0

Appendix 6-A (Continued)

Date	Division	Taxon	TRM 496.5	TRM 506.6	TRM 518.0	TRM 527.4	TRM 528.0	TRM 529.5
Dec 1985	Cyanophyta	Anacystis	0	0	0	0	0	0
		Chroococcus	0	0	0	0	0	0
		Dactylococcopsis	0	0	0	0	0	0
		Lyngbya	0	0	0	0	0	0
		Merismopedia	0	125	0	0	0	0
		Oscill. Spiral	0	0	0	0	0	0
		Oscillatoria	0	0	0	0	0	0
		Phormidium	0	0	0	0	0	0
	Euglenophyta	Euglena	0	0	0	0	0	0
		Trachelomonas	0	0	0	0	0	0
	Pyrrhophyta	Glenodinium	0	0	0	0	0	0
		Gymnodinium	0	0	0	0	0	0

*Dash indicates no substrates were recovered from that location.

APPENDIX 6-B

STATISTICAL SUMMARY OF PERIPHYTON ABUNDANCE DATA COLLECTED DURING PREOPERATIONAL MONITORING PERIODS (1974-1985), WATTS BAR NUCLEAR PLANT, CHICKAMAUGA RESERVOIR

Appendix 6-B. Statistical Summary of Periphyton Abundance Data Collected During Preoperational Monitoring Periods (1974-1985), Watts Bar Nuclear Plant, Chickamauga Reservoir.

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
May 74	506.6	1	Total	63300	62676	883.2	1.41
		2		62051			
		1	Chlorophyta	1151	1480	464.6	31.40
		2		1808			
		1	Chrysophyta	60670	59619	1487.0	2.49
		2		58567			
		1	Cyanophyta	1479	1578	139.3	8.83
		2		1676			
May 74	518.0	1	Total	77729	71122	9343.7	13.14
		2		64515			
		1	Chlorophyta	0	657	929.1	141.42
		2		1314			
		1	Chrysophyta	76578	69528	9970.2	14.34
		2		62478			
		1	Cyanophyta	1151	937	302.6	32.30
		2		723			
May 74	527.4	1	Total	53933	41756	17221.6	41.24
		2		29578			
		1	Chlorophyta	1413	1298	163.3	12.59
		2		1182			
		1	Chrysophyta	52126	40195	16873.0	41.98
		2		28264			
		1	Cyanophyta	394	263	185.3	70.44
		2		132			
May 74	528.0	1	Total	47854	47854		
		1	Chlorophyta	1151	1151		
		1	Chrysophyta	46374	46374		
		1	Cyanophyta	329	329		

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
May 74	529.5	1	Total	66323	72321	8482.5	11.73
		2		78319			
		1	Chlorophyta	789	1414	883.2	62.48
		2		2038			
		1	Chrysophyta	65337	70645	7505.9	10.62
		2		75952			
		1	Cyanophyta	197	263	93.3	35.49
		2		329			
Aug 74	506.6	1	Total	23928	21232	3813.4	17.96
		2		18535			
		1	Chlorophyta	197	394	278.6	70.71
		2		591			
		1	Chrysophyta	23731	20838	4092.0	19.64
		2		17944			
Aug 74	518.0	1	Total	20803	23038	3160.8	13.72
		2		25273			
		1	Chlorophyta	197	411	301.9	73.55
		2		624			
		1	Chrysophyta	20606	22628	2858.8	12.63
		2		24649			
Aug 74	527.4	1	Total	22152	33014	15360.5	46.53
		2		43875			
		1	Chlorophyta	263	838	813.2	97.04
		2		1413			
		1	Chrysophyta	21889	32176	14547.3	45.21
		2		42462			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Aug 74	528.0	1	Total	54064	49693	6182.2	12.44
		2		45321			
		1	Chlorophyta	1282	1545	371.2	24.04
		2		1807			
		1	Chrysophyta	52782	48148	6553.5	13.61
		2		43514			
Aug 74	529.5	1	Total	43614	48840	7390.0	15.13
		2		54065			
		1	Chlorophyta	1710	2334	882.5	37.81
		2		2958			
		1	Chrysophyta	41904	46506	6507.5	13.99
		2		51107			
June 75	506.6	1	Total	349609	349781	242.5	0.07
		2		349952			
		1	Chlorophyta	208090	172048	50971.1	29.63
		2		136006			
		1	Chrysophyta	121271	167578	65487.3	39.08
		2		213884			
		1	Cyanophyta	20248	10155	14273.7	140.56
		2		62			
June 75	518.0	1	Total	212387	212387		
		1	Chlorophyta	9657	9657		
		1	Chrysophyta	202356	202356		
		1	Cyanophyta	374	374		
June 75	527.4	1	Total	324596	324596		
		1	Chlorophyta	144199	144199		
		1	Chrysophyta	179619	179619		
		1	Cyanophyta	778	778		

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
June 75	528.0	1 Total	289674	289674		
		1 Chlorophyta	106692	106692		
		1 Chrysophyta	181051	181051		
		1 Cyanophyta	1931	1931		
June 75	529.5	1 Total	396150	318350	110025.8	34.56
		2	240550			
		1 Chlorophyta	194820	125929	97426.6	77.37
		2	57038			
		1 Chrysophyta	200489	191861	12202.5	6.36
		2	183232			
		1 Cyanophyta	841	561	396.7	70.77
		2	280			
May 76	506.6	1 Total	388078	389048	1371.1	0.35
		2	390017			
		1 Chlorophyta	172019	177623	7924.5	4.46
		2	183226			
		1 Chrysophyta	214054	209535	6390.8	3.05
		2	205016			
		1 Cyanophyta	2005	1808	278.6	15.41
		2	1611			
		1 Euglenophyta	0	82	116.0	141.42
		2	164			
May 76	518.0	1 Total	354128	342314	16708.2	4.88
		2	330499			
		1 Chlorophyta	133435	108474	35300.9	32.54
		2	83512			
		1 Chrysophyta	219542	232821	18779.3	8.07
		2	246100			
		1 Cyanophyta	1151	1019	186.7	18.32
		2	887			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
May 76	527.4	1	Total	73191	66700	9179.7	13.76
		2		60209			
		1	Chlorophyta	14067	14609	766.5	5.25
		2		15151			
		1	Chrysophyta	58861	51960	9760.2	18.78
		2		45058			
		1	Cyanophyta	263	132	186.0	141.42
		2		0			
May 76	528.0	1	Total	425678	419318	8994.4	2.15
		2		412958			
		1	Chlorophyta	152103	154141	2881.5	1.87
		2		156178			
		1	Chrysophyta	272622	264224	11876.6	4.49
		2		255826			
		1	Cyanophyta	953	954	0.7	0.07
		2		954			
May 76	529.5	1	Total	444803	454909	14292.0	3.14
		2		465015			
		1	Chlorophyta	149703	159136	13339.6	8.38
		2		168568			
		1	Chrysophyta	293785	294459	952.5	0.32
		2		295132			
		1	Cyanophyta	1315	1299	23.3	1.80
		2		1282			
		1	Pyrrhophyta	0	17	23.3	141.42
		2		33			
Aug 76	506.6	1	Total	102178	108226	8553.2	7.90
		2		114274			
		1	Chlorophyta	3385	6425	4299.2	66.91
		2		9465			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Chrysophyta	95343	98893	5019.8	5.08
		2		102442			
		1	Cyanophyta	3450	2909	765.8	26.33
		2		2367			
Aug 76	518.0	1	Total	175635	199972	34417.0	17.21
		2		224308			
		1	Chlorophyta	136261	156096	28050.2	17.97
		2		175930			
		1	Chrysophyta	36153	40918	6738.7	16.47
		2		45683			
		1	Cyanophyta	3188	2942	348.6	11.85
		2		2695			
		1	Euglenophyta	33	17	23.3	141.42
		2		0			
Aug 76	527.4	1	Total	181671	191671		
		1	Chlorophyta	56824	56824		
		1	Chrysophyta	131955	131955		
		1	Cyanophyta	2892	2892		
Aug 76	529.5	1	Total	173072	192183	27027.0	14.06
		2		211294			
		1	Chlorophyta	73357	87588	20125.0	22.98
		2		101818			
		1	Chrysophyta	99715	104596	6902.1	6.60
		2		109476			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Jun 77	518.0	1	Total	584025	584025		
		1	Chlorophyta	241202	241202		
		1	Chrysophyta	342198	342198		
		1	Cyanophyta	625	625		
Jun 77	527.4	1	Total	249189	371630	173157.7	46.59
		2		494071			
		1	Chlorophyta	99550	92928	9364.9	10.08
		2		86306			
		1	Chrysophyta	148981	278275	182848.6	65.71
		2		407568			
		1	Cyanophyta	658	428	326.0	76.25
		2		197			
Jun 77	528.0	1	Total	267756	306868	55312.0	18.02
		2		345979			
		1	Chlorophyta	40655	39390	1789.0	4.54
		2		38125			
		1	Chrysophyta	226246	266491	56915.0	21.36
		2		306736			
		1	Cyanophyta	855	987	186.0	18.85
		2		1118			
Sep 77	496.5	1	Total	173989	173989		
		1	Chlorophyta	12751	12751		
		1	Chrysophyta	161041	161041		
		1	Cyanophyta	197	197		

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Sep 77	506.6	1	Total	44860	44500	509.8	1.15
		2		44139			
		1	Chlorophyta	24584	22579	2835.5	12.56
		2		20574			
		1	Chrysophyta	20145	21855	2418.3	11.07
		2		23565			
		1	Cyanophyta	131	66	92.6	141.42
		2		0			
Sep 77	518.0	1	Total	262859	241859	29699.2	12.28
		2		220858			
		1	Chlorophyta	31222	28281	4159.2	14.71
		2		25340			
		1	Chrysophyta	231078	213167	25330.7	11.88
		2		195255			
		1	Cyanophyta	559	411	209.3	50.93
		2		263			
Sep 77	527.4	1	Total	51697	37910	19497.8	51.43
		2		24123			
		1	Chlorophyta	13639	9236	6227.5	67.43
		2		4832			
		1	Chrysophyta	38058	28675	13270.3	46.28
		2		19291			
Sep 77	528.0	1	Total	82657	70086	17778.1	25.37
		2		57515			
		1	Chlorophyta	36152	31239	6948.7	22.24
		2		26325			
		1	Chrysophyta	46078	38486	10736.7	27.90
		2		30894			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Cyanophyta	427	362	92.6	25.62
		2		296			
Dec 77	496.5	1	Total	166991	166991		
		1	Chlorophyta	66	66		
		1	Chrysophyta	166761	166761		
		1	Cyanophyta	164	164		
Dec 77	506.6	1	Total	63530	61541	2813.6	4.57
		2		59551			
		1	Chlorophyta	11898	19309	10480.0	54.28
		2		26719			
		1	Chrysophyta	51533	42100	13340.3	31.69
		2		32667			
		1	Cyanophyta	99	132	46.7	35.36
		2		165			
Dec 77	518.0	1	Total	132055	145562	19101.8	13.12
		2		159069			
		1	Chlorophyta	6146	5505	906.5	16.47
		2		4864			
		1	Chrysophyta	125712	139926	20100.9	14.37
		2		154139			
		1	Cyanophyta	197	115	116.0	100.84
		2		33			
		1	Pyrrhophyta	0	17	23.3	141.42
		2		33			
Dec 77	527.4	1	Total	122590	122590		
		1	Chlorophyta	5949	5949		
		1	Chrysophyta	115786	115786		
		1	Cyanophyta	822	822		
		1	Pyrrhophyta	33	33		

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Jun 82	506.6	1	Total	3823573	3820187	159422.0	4.17
		2		3977889			
		3		3659099			
		1	Chlorophyta	1016063	950337	57792.5	6.08
		2		927476			
		3		907472			
		1	Chrysophyta	2261376	2392300	144574.8	6.04
		2		2547462			
		3		2368063			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	546134	477550	84209.1	17.63
		2		502951			
		3		383564			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhotophyta	0	0	0.0	
		2		0			
		3		0			
Jun 82	518.0	1	Total	852701	851218	15296.0	1.80
		2		865719			
		3		835235			
		1	Chlorophyta	254968	258726	10593.7	4.09
		2		270686			
		3		250523			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Chrysophyta	168446	180564	14119.0	7.82
		2		177177			
		3		196068			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	429287	411929	20959.7	5.09
		2		417856			
		3		388644			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Jun 82	527.4	1	Total	260124	227674	39903.6	17.53
		2		239779			
		3		183120			
		1	Chlorophyta	32195	32437	2998.9	9.25
		2		35550			
		3		29567			
		1	Chrysophyta	159345	149921	2998.9	9.25
		2		156982			
		3		133435			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	68584	45316	24290.6	53.60
		2		47247			
		3		20118			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Jun 82	528.0	1	Total	646064	668875	20133.8	3.01
		2		684168			
		3		676393			
		1	Chlorophyta	189102	176846	13537.0	7.65
		2		179120			
		3		162316			
		1	Chrysophyta	334729	355267	17889.8	5.04
		2		363612			
		3		367459			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	122233	136762	12846.8	9.39
		2		141436			
		3		146618			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Jun 82	529.5	1	Total	228005	246701	19102.2	7.74
		2		245913			
		3		266185			
		1	Chlorophyta	35436	39284	4232.9	10.78
		2		38598			
		3		43818			
		1	Chrysophyta	163306	162405	1246.3	0.77
		2		160983			
		3		162927			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	29263	45012	15131.8	33.62
		2		46332			
		3		59440			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Aug 82	496.5	1	Total	296590	272152	24994.4	9.18
		2		273230			
		3		246636			
		1	Chlorophyta	46866	47792	851.5	1.78
		2		47970			
		3		48541			
		1	Chrysophyta	137398	126691	10962.9	8.65
		2		127185			
		3		115489			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	112326	97669	14864.2	15.22
		2		98075			
		3		82606			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Aug 82	506.6	1	Total	5865	3655	2097.0	57.37
		2		3408			
		3		1693			
		1	Chlorophyta	133	127	85.7	67.64
		2		38			
		3		209			
		1	Chrysophyta	5732	3529	2128.4	60.32
		2		3370			
		3		1484			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Aug 82	518.0	1	Total	220574	217411	11069.8	5.09
		2		226555			
		3		205104			
		1	Chlorophyta	11583	14009	2823.4	20.15
		2		13335			
		3		17108			
		1	Chrysophyta	157782	153666	4815.8	3.13
		2		154847			
		3		148370			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	51209	49736	9459.9	19.02
		2		58373			
		3		39626			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Aug 82	527.4	1	Total	143418	154010	25271.2	16.41
		2		135759			
		3		182854			
		1	Chlorophyta	10745	13234	4213.3	31.84
		2		10859			
		3		18099			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Chrysophyta	110726	119896	17762.5	14.81
		2		108592			
		3		140369			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	21947	20880	4143.3	19.84
		2		16308			
		3		24386			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Aug 82	528.0	1	Total	218172	230175	12992.0	5.64
		2		228383			
		3		243970			
		1	Chlorophyta	40426	41734	1543.1	3.70
		2		43436			
		3		41341			
		1	Chrysophyta	130881	151000	19766.9	13.09
		2		151723			
		3		170395			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	46865	37441	8176.4	21.84
		2		33224			
		3		32234			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Aug 82	529.5	1	Total	54830	66638	10226.4	15.35
		2		72428			
		3		72655			
		1	Chlorophyta	4381	5206	769.4	14.78
		2		5904			
		3		5333			
		1	Chrysophyta	48925	55362	5827.2	10.53
		2		60277			
		3		56885			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	1524	6069	4459.2	73.47
		2		6247			
		3		10437			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Dec 82	496.5	1	Total	1565373	1692381	171158.2	10.11
		2		1624749			
		3		1887022			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Chlorophyta	507397	586248	125735.3	21.45
		2		520097			
		3		731249			
		1	Chrysophyta	1057976	1106134	48915.3	4.42
		2		1104652			
		3		1155773			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Dec 82	529.5	1	Total	71530	77357	5182.4	6.70
		2		79089			
		3		81451			
		1	Chlorophyta	2857	3142	1590.2	50.62
		2		1713			
		3		4855			
		1	Chrysophyta	33632	38310	4155.5	10.85
		2		41573			
		3		39726			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Cyanophyta	35041	35905	918.7	2.56
		2		35803			
		3		36870			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 83	496.5	1	Total	1498453	1524641	22688.1	1.49
		2		1537111			
		3		1538359			
		1	Chlorophyta	0	0	0.0	
		2		0			
		3		0			
		1	Chrysophyta	1498453	1524641	22688.1	1.49
		2		1537111			
		3		1538359			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Feb 83	518.0	1	Total	263850	238566	37127.6	15.56
		2		255908			
		3		195941			
		1	Chlorophyta	0	0	0.0	
		2		0			
		3		0			
		1	Chrysophyta	263850	238566	37127.6	15.56
		2		255908			
		3		195941			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 83	527.4	1	Total	6056	5195	879.6	16.93
		2		4298			
		3		5232			
		1	Chlorophyta	0	8	14.4	173.21
		2		25			
		3		0			
		1	Chrysophyta	6056	5187	892.4	17.20
		2		4273			
		3		5232			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 83	528.0	1	Total	9021	8564	717.8	8.38
		2		7737			
		3		8935			
		1	Chlorophyta	0	0	0.0	
		2		0			
		3		0			
		1	Chrysophyta	9021	8564	717.8	8.38
		2		7737			
		3		8935			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
May 83	506.6	1	Total	1632521	1641043	7386.9	0.45
		2		1645616			
		3		1644992			
		1	Chlorophyta	779781	766478	18886.3	2.46
		2		774792			
		3		744861			
		1	Chrysophyta	740496	728233	11160.2	1.53
		2		718672			
		3		725530			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	112244	146332	31583.2	21.58
		2		152152			
		3		174601			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
May 83	518.0	1	Total	1784052	1794235	64521.5	3.60
		2		1735411			
		3		1863243			
		1	Chlorophyta	409066	447519	36016.7	8.05
		2		480465			
		3		453027			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Chrysophyta	1055715	1024951	55731.7	5.44
		2		960618			
		3		1058520			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	319271	321765	28765.2	8.94
		2		294328			
		3		351696			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Sep 83	506.6	1	Total	36228	29147	10060.5	34.52
		2		33582			
		3		17631			
		1	Chlorophyta	18784	13198	10523.5	79.74
		2		19750			
		3		1059			
		1	Chrysophyta	17444	15939	1879.7	11.79
		2		13832			
		3		16541			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Euglenophyta	0	10	17.9	173.21
		2		0			
		3		31			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Sep 83	529.5	1	Total	61460	63194	10744.0	17.00
		2		74700			
		3		53423			
		1	Chlorophyta	3769	5046	1380.0	27.35
		2		6510			
		3		4859			
		1	Chrysophyta	41492	42614	4681.5	10.99
		2		47755			
		3		38596			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	16199	15534	5265.1	33.89
		2		20435			
		3		9968			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Nov 83	496.5	1	Total	82707	76207	6094.6	8.00
		2		75293			
		3		70621			
		1	Chlorophyta	29096	24651	4129.7	16.75
		2		20933			
		3		23925			
		1	Chrysophyta	53611	51556	4225.2	8.20
		2		54360			
		3		46696			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Nov 83	518.0	1	Total	102549	101916	1872.9	1.84
		2		99809			
		3		103391			
		1	Chlorophyta	8784	10321	1374.8	13.32
		2		11433			
		3		10747			
		1	Chrysophyta	93765	91595	2843.5	3.10
		2		88376			
		3		92644			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Nov 83	527.4	1	Total	93516	101065	7144.0	7.07
		2		107720			
		3		101958			
		1	Chlorophyta	7258	9740	2150.0	22.07
		2		10934			
		3		11028			
		1	Chrysophyta	86258	91325	5275.1	5.78
		2		96786			
		3		90930			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Nov 83	528.0	1	Total	113140	104190	11209.7	10.76
		2		107814			
		3		91617			
		1	Chlorophyta	9750	11796	2088.2	17.70
		2		13924			
		3		11713			
		1	Chrysophyta	98157	87078	11120.2	12.77
		2		87161			
		3		75917			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	5233	5316	1372.9	25.82
		2		6729			
		3		3987			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Nov 83	529.5	1	Total	95231	84888	8965.4	10.56
		2		80090			
		3		79342			
		1	Chlorophyta	11246	9813	1272.3	12.97
		2		8816			
		3		9377			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Chrysophyta	83985	75075	7744.3	10.32
		2		71274			
		3		69965			
		1	Cryptopyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 84	506.6	1	Total	193496	196967	3019.3	1.53
		2		198423			
		3		198983			
		1	Chlorophyta	0	0	0.0	
		2		0			
		3		0			
		1	Chrysophyta	193496	196967	3019.3	1.53
		2		198423			
		3		198983			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 84	518.0	1	Total	164438	162235	31040.2	1.94
		2		163627			
		3		158639			
		1	Chlorophyta	561	187	323.9	173.21
		2		0			
		3		0			
		1	Chrysophyta	160884	161050	2498.1	1.55
		2		163627			
		3		158639			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	2993	998	1728.0	173.21
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Feb 84	527.4	1	Total	198484	183788	14355.5	7.81
		2		183082			
		3		169799			
		1	Chlorophyta	187	62	108.0	173.21
		2		0			
		3		0			
		1	Chrysophyta	198297	183726	14259.9	7.76
		2		183082			
		3		169799			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 84	528.0	1	Total	280235	280525	1639.9	0.58
		2		282291			
		3		279050			
		1	Chlorophyta	0	0	0.0	
		2		0			
		3		0			
		1	Chrysophyta	280235	280525	1639.9	0.58
		2		282291			
		3		279050			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			
		1	Pyrrhophyta	0	0	0.0	
		2		0			
		3		0			
Feb 84	529.5	1	Total	39381	34453	4584.1	13.31
		2		33661			
		3		30316			
		1	Chlorophyta	112	37	64.7	173.21
		2		0			
		3		0			
		1	Chrysophyta	39269	34415	4523.9	13.15
		2		33661			
		3		30316			
		1	Cryptophyta	0	0	0.0	
		2		0			
		3		0			
		1	Cyanophyta	0	0	0.0	
		2		0			
		3		0			
		1	Euglenophyta	0	0	0.0	
		2		0			
		3		0			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
		1 Pyrrhophyta	0	0	0.0	
		2	0			
		3	0			
Jul 84	496.5	1 Total	842017	742697	107361.0	14.46
		2	628787			
		3	757286			
		1 Chlorophyta	341417	347595	43552.4	12.53
		2	307462			
		3	393907			
		1 Chrysophyta	450758	348582	89518.2	25.68
		2	283944			
		3	311045			
	506.6	1 Total	788438	810244	46954.4	5.80
		2	864136			
		3	778157			
		1 Chlorophyta	411975	382745	36688.6	9.59
		2	394686			
		3	341573			
		1 Chrysophyta	307930	339445	28925.1	8.52
		2	364782			
		3	345623			
		1 Cyanophyta	68533			
		2	104668			
		3	90961			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
	518.0	1	Total	668661	682212	33216.1	4.87
		2		657913			
		3		720061			
		1	Chlorophyta	316497	340431	28066.8	8.24
		2		371322			
		3		333474			
		1	Chrysophyta	289862	264526	56891.4	21.51
		2		199368			
		3		304348			
		1	Cyanophyta	62302	77255	13187.0	17.07
		2		87223			
		3		82239			
Sep 84	496.5	1	Total	347024	385600	42580.5	11.04
		2		431289			
		3		378486			
		1	Chlorophyta	100463	137065	32125.1	23.44
		2		150149			
		3		160584			
		1	Chrysophyta	213852	209180	28480.9	13.62
		2		235036			
		3		178652			
		1	Cyanophyta	32709	39354	6698.1	17.02
		2		46104			
		3		39250			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm^2	Mean	STD*	CV†
Sep 84	506.6	1	Total	616172	574273	38652.0	6.73
		2		540007			
		3		566640			
		1	Chlorophyta	214321	182338	28063.7	15.39
		2		170864			
		3		161830			
		1	Chrysophyta	296871	290278	11554.8	3.98
		2		276936			
		3		297027			
		1	Cyanophyta	104980	101657	8302.8	8.17
		2		92207			
		3		107783			
	518.0	1	Total	261203	257049	6924.2	2.69
		2		249056			
		3		260889			
		1	Chlorophyta	76632	74192	8899.5	12.00
		2		81617			
		3		64327			
		1	Chrysophyta	170864	141530	27993.1	19.78
		2		115105			
		3		138621			
		1	Cyanophyta	13707	41327	24083.6	58.28
		2		52334			
		3		57941			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
Sep 84	527.4	1 Total	233168	237270	3977.9	1.68
		2	237530			
		3	241111			
		1 Chlorophyta	49686	55501	5152.8	9.28
		2	57319			
		3	59499			
		1 Chrysophyta	141116	133692	8280.3	6.19
		2	124762			
		3	135197			
		1 Cyanophyta	42366	48077	6697 9	13.93
		2	55449			
		3	46415			
	528.0	1 Total	253726	247860	5918.7	2.39
		2	241890			
		3	247963			
		1 Chlorophyta	52490	46779	5287.5	11.30
		2	45792			
		3	42054			
		1 Chrysophyta	146411	136183	9584.5	7.04
		2	134730			
		3	127408			
		1 Cyanophyta	54825	64898	12226.4	18.84
		2	61368			
		3	78501			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Dec 84	496.5	1	Total	431601	417945	19744.5	4.72
		2		426927			
		3		395306			
		1	Chlorophyta	82862	95530	11404.5	11.94
		2		104979			
		3		98749			
		1	Chrysophyta	348739	322415	26094.1	8.09
		2		321948			
		3		296557			
	506.6	1	Total	182857	184571	22710.1	12.30
		2		208090			
		3		162767			
		1	Chlorophyta	26634	33072	10221.3	30.91
		2		44858			
		3		27725			
		1	Chrysophyta	156223	151499	14676.1	9.69
		2		163232			
		3		135042			
	527.4	1	Total	176471	186388	13217.1	7.09
		2		201393			
		3		181300			
		1	Chlorophyta	56851	60901	4302.6	7.06
		2		65418			
		3		60433			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
Dec 84	527.4	1 Chrysophyta	119620	125487	9104.0	7.25
		2	135975			
		3	120867			
	528.0	1 Total	347803	358291	25793.5	7.20
		2	339393			
		3	387676			
		1 Chlorophyta	178964	174966	17861.2	10.21
		2	155445			
		3	190490			
		1 Chrysophyta	137688	137844	2384.6	1.75
		2	137844			
		3	133638			
		1 Cyanophyta	31151	46934	16214.5	34.55
		2	46104			
		3	63548			
	529.5	1 Total	404342	402733	24415.8	6.06
		2	377553			
		3	426305			
		1 Chlorophyta	175381	172941	14561.6	8.42
		2	157314			
		3	186129			
		1 Chrysophyta	182857	175174	8905.6	5.08
		2	165413			
		3	177251			
		1 Cyanophyta	46104	54618	8412.4	15.40
		2	54826			
		3	62925			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Mar 85	496.5	1	Total	24486	25436	906.2	3.56
		2		25531			
		3		26291			
		1	Chlorophyta	761	989	208.7	21.11
		2		1034			
		3		1171			
		1	Chrysophyta	22703	22869	639.4	2.80
		2		22329			
		3		23575			
		1	Cyanophyta	997	1528	548.8	35.91
		2		2093			
		3		1495			
		1	Euglenophyta	25	50	25.0	50.00
		2		75			
		3		50			
	506.6	1	Total	29419	27804	3104.7	11.17
		2		29769			
		3		24225			
		1	Chrysophyta	29419	27804	3104.7	11.17
		2		29769			
		3		24225			
	528.0	1	Total	28821	27247	1486.6	5.46
		2		25867			
		3		27052			
		1	Chrysophyta	28821	27247	1486.6	5.46
		2		25867			
		3		27052			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
Mar 85	529.5	1 Total	6304	6832	578.9	8.47
		2	7451			
		3	6741			
		1 Chrysophyta	6304	6832	578.9	8.47
		2	7451			
		3	6741			
May 85	496.5	1 Total	245783	240643	8982.5	3.73
		2	245875			
		3	230271			
		1 Chlorophyta	121863	120306	8425.6	7.00
		2	127844			
		3	111210			
		1 Chrysophyta	123920	120337	3145.1	2.61
		2	118031			
		3	119061			
	506.6	1 Total	171208	172297	13072.1	7.59
		2	185880			
		3	159804			
		1 Chlorophyta	95323	99061	9187.2	9.27
		2	109528			
		3	92332			
		1 Chrysophyta	75885	73236	4997.5	6.82
		2	76352			
		3	67472			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
May 85	518.0	1	Total	285780	258835	27489.3	10.62
		2		259894			
		3		230832			
		1	Chlorophyta	119246	112518	10386.3	9.23
		2		117752			
		3		100556			
		1	Chrysophyta	105976	92986	11728.1	12.61
		2		89808			
		3		83175			
		1	Cyanophyta	60558	53331	6783.7	12.72
		2		52334			
		3		47101			
	527.4	1	Total	264849	264941	4533.2	1.71
		2		269519			
		3		260454			
		1	Chlorophyta	105603	111802	5457.5	4.88
		2		113920			
		3		115883			
		1	Chrysophyta	99996	95758	3999.0	4.18
		2		92051			
		3		95228			
		1	Cyanophyta	59250	57380	7284.7	12.70
		2		63548			
		3		49343			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
May 85	528.0	1 Total	249243	255440	12055.0	4.72
		2	247744			
		3	269333			
		1 Chlorophyta	95229	102674	6552.8	6.38
		2	105229			
		3	107565			
		1 Chrysophyta	97942	98687	1543.8	1.56
		2	97657			
		3	100462			
		1 Cyanophyta	56072	54079	8403.2	15.54
		2	44858			
		3	61306			
	529.5	1 Total	221298	217465	4826.5	2.22
		2	219053			
		1 Chlorophyta	119247	111365	7170.6	6.44
		2	109620			
		3	111365			
		1 Chrysophyta	102051	106100	3742.8	3.53
		2	109433			
		3	106817			
Sep 85	496.5	1 Total	266625	250644	20272.0	8.09
		2	227841			
		3	257466			
		1 Chlorophyta	102051	98282	4927.6	5.01
		2	92706			
		3	100089			

Appendix 6-B (Continued)

Date	River Mile	Rep. No.	Group	No/cm²	Mean	STD*	CV†
Sep 85	496.5	1	Chrysophyta	119716	111990	11723.0	10.47
		2		98501			
		3		117753			
		1	Cyanophyta	44858	40372	4162.7	10.31
		2		36634			
		3		39624			
	506.6	1	Total	71585	64763	7279.1	11.24
		2		57100			
		3		65605			
		1	Chlorophyta	9719	8068	1448.5	17.95
		2		7009			
		3		7477			
		1	Chrysophyta	61866	56695	6016.9	10.61
		2		50091			
		3		58128			
	518.0	1	Total	328678	327805	30009.5	9.15
		2		358678			
		3		297368			
		1	Chlorophyta	75044	69997	18558.5	26.51
		2		85510			
		3		49437			
		1	Chrysophyta	196814	201112	3727.2	1.85
		2		203450			
		3		203073			
		1	Cyanophyta	56820	56695	11775.5	20.77
		2		68408			
		3		44858			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
Sep 85	527.4	1 Total	346901	328490	21890.8	6.66
		2	334284			
		3	304285			
		1 Chlorophyta	65605	48908	34995.3	71.55
		2	72427			
		3	8691			
		1 Chrysophyta	228962	226750	8854.3	3.90
		2	216999			
		3	234288			
		1 Cyanophyta	52334	52833	8235.3	15.59
		2	44858			
		3	61306			
Sep 85	528.0	1 Total	354375	357429	2950.6	0.83
		2	360264			
		3	357647			
		1 Chlorophyta	74108	80152	6325.1	7.89
		2	79623			
		3	86725			
		1 Chrysophyta	231671	231921	2998.3	1.29
		2	235036			
		3	229055			
		1 Cyanophyta	48596	45356	3371.4	7.43
		2	45605			
		3	41867			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
Dec 85	496.5	1 Total	137283	136941	8182.9	5.98
		2	128592			
		3	144947			
		1 Chlorophyta	56539	57162	5168.3	9.04
		2	52334			
		3	62614			
		1 Chrysophyta	80744	79778	3150.5	3.95
		2	76258			
		3	82333			
	506.6	1 Total	140929	132424	7489.2	5.66
		2	129527			
		3	126816			
		1 Chlorophyta	75137	70869	4348.1	6.14
		2	71025			
		3	66445			
		1 Chrysophyta	65418	61430	3577.6	5.82
		2	58502			
		3	60371			
		1 Cyanophyta	374	125	215.9	173.21
		2	0			
		3	0			
	518.0	1 Total	168311	166472	2216.6	1.33
		2	167095			
		3	164011			

Appendix 6-B (Continued)

Date	River Mile	Rep. No. Group	No/cm²	Mean	STD*	CV†
Dec 85	527.4	1 Total	127379	119403	9774.5	8.19
		2	108499			
		3	122330			
		1 Chlorophyta	59624	54701	5261.7	9.62
		2	49156			
		3	55324			
		1 Chrysophyta	67755	64701	4655.5	7.20
		2	59343			
		3	67006			
Dec 85	528.0	1 Total	117378	113048	9507.7	8.41
		2	102146			
		3	119620			
		1 Chlorophyta	46821	45263	4863.9	10.75
		2	39811			
		3	49157			
		1 Chrysophyta	70557	67785	4270.1	6.96
		2	62335			
		3	70463			
	529.5	1 Total	142049	131676	10467.2	7.95
		2	121117			
		3	131863			
		1 Chlorophyta	65511	59779	5272.2	8.82
		2	55137			
		3	58689			
		1 Chrysophyta	76538	71897	5393.5	7.50
		2	65980			
		3	73174			

*Standard deviation.
†Coefficient of variation.

APPENDIX 6-C

INDIVIDUAL SAMPLE VALUES FOR CONCENTRATIONS OF CHLOROPHYLL A, B, C, AND PHAEOPHYTIN A, ASH-FREE ORGANIC WEIGHTS, CORRECTED CHLOROPHYLL A CONCENTRATIONS, AND AUTOTROPHIC INDICES, WATTS BAR NUCLEAR PLANT PREOPERATIONAL MONITORING (1974-1985), CHICKAMAUGA RESERVOIR

Appendix 6-C. Individual Sample Values for Concentrations of Chlorophylls a, b, c, and Phaeophytin a, Ash-Free Organic Weights, Corrected Chlorophyll a Concentrations, and Autotrophic Indices, Watts Bar Nuclear Plant Preoperational Monitoring (1974-1985), Chickamauga Reservoir.

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
May 76	506.6	1	8.60	1.58	3.02	6.26	49.58	4710.96	95.01	43.01	109.53
		2	74.77	1.16	3.63	9.91	68.69	6458.22	94.02	22.59	285.95
		3	16.33	1.50	0.00	7.46	52.27	4623.29	88.46	40.82	113.27
		4	15.49	1.51	3.09	6.98	53.32	5075.34	95.18	42.57	119.21
		5	15.54	1.51	0.70	8.56	51.24	4965.75	96.92	40.38	122.98
		6	23.35	1.47	4.20	8.30	64.85	5709.59	88.04	49.16	116.15
		7	19.71	1.47	2.99	7.55	54.07	5216.44	96.47	40.82	127.80
		8	18.04	1.52	4.14	9.06	66.16	5465.07	82.61	53.55	102.06
May 76	518.0	1	32.61	1.40	8.17	7.58	64.74	6006.85	92.79	43.89	136.86
		2	33.44	1.44	8.51	8.61	79.33	6311.64	79.56	57.50	109.77
		3	29.06	1.44	9.97	7.67	68.35	6109.59	89.39	49.60	123.19
		4	25.46	1.45	11.76	6.46	61.47	5938.36	96.60	45.21	131.36
		5	25.41	1.44	8.93	6.23	60.76	4800.68	79.02	44.33	108.30
		6	28.62	1.42	8.82	6.57	62.26	4850.68	77.91	43.89	110.52
		7	31.21	1.41	9.83	7.39	63.30	6173.97	97.54	43.45	142.09
		8	21.55	1.46	7.12	7.25	54.88	5404.11	98.47	40.82	132.39
May 76	527.0	1	2.73	1.54	0.30	1.58	11.49	1111.64	96.72	9.51	116.90
		2	2.20	1.58	0.49	1.52	12.45	1030.14	82.75	10.75	95.80
		3	2.21	1.57	0.11	1.56	11.57	983.56	85.00	9.88	99.60
		4	2.47	1.54	0.00	1.36	10.31	1260.27	122.19	8.49	148.52
		5	63.95	1.27	10.30	10.64	80.48	9182.19	114.09	40.82	224.95
		6	44.69	1.43	10.18	14.88	102.05	11154.11	109.30	72.97	152.86
		7	55.42	1.37	11.27	12.01	97.73	10300.00	105.39	62.54	164.68
		8	55.99	1.39	18.02	12.49	106.11	10074.66	94.94	70.80	142.31

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
May 76	528.0	1	30.84	1.47	12.65	11.79	83.52	7926.71	94.91	63.41	125.00
		2	52.68	1.38	12.19	14.13	95.96	9139.04	95.23	62.54	146.12
		3	28.71	1.47	7.68	13.33	76.28	8124.66	106.51	57.33	141.71
		4	36.22	1.46	12.18	14.08	91.33	9119.86	99.86	67.76	134.60
		5	25.10	1.45	5.97	10.33	62.52	7067.81	113.04	46.04	153.52
		6	21.24	1.47	5.31	9.07	58.88	6747.26	114.60	44.74	150.82
		7	30.45	1.43	5.61	12.87	69.39	8243.84	118.80	49.51	166.50
		8	25.09	1.49	10.08	10.07	74.87	6982.88	93.27	58.25	119.89
May 76	529.9	1	57.41	1.22	9.67	7.28	61.12	5935.62	97.11	25.92	228.97
		2	47.59	1.30	11.66	8.97	64.91	6119.86	94.28	35.52	172.28
		3	37.19	1.34	11.03	8.57	58.95	5902.74	100.13	35.84	164.68
		4	35.40	1.38	14.43	8.58	64.57	5963.70	92.37	42.56	140.11
		5	20.00	1.43	7.53	7.46	45.42	4738.36	104.32	32.64	145.15
		6	44.58	1.25	9.53	7.71	51.96	5354.11	103.04	24.64	217.27
		7	34.53	1.32	9.67	7.92	51.13	5240.41	102.49	29.76	176.07
		8	34.44	1.37	11.47	8.17	60.56	5295.21	87.44	39.04	135.62
Aug. 76	506.6	1	48.80	1.25	0.00	10.02	58.69	7200.00	122.67	27.91	258.00
		2	19.42	1.45	0.00	8.32	48.90	7393.15	151.17	35.79	206.58
		3	19.74	1.42	2.43	7.79	42.78	5877.40	137.38	29.88	196.69
		4	19.32	1.52	0.00	10.89	69.48	8089.73	116.44	55.59	145.51
		5	35.20	1.43	0.89	15.90	77.85	6834.25	87.79	54.55	125.28
		6	32.26	1.47	0.00	16.90	86.53	9257.53	106.99	64.52	143.49
		7	40.62	1.41	2.80	15.53	82.46	8936.30	108.37	55.94	159.74
		8	51.83	1.38	0.00	13.14	96.67	7778.08	80.46	62.76	123.93

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Aug. 76	518.0	1	120.3	1.37	36.01	13.26	207.24	19105.48	92.19	131.76	145.00
		2	195.4	1.09	30.33	10.65	147.11	20123.97	136.80	29.17	689.91
		3	229.9	1.08	33.95	15.06	167.84	20273.29	120.79	29.17	695.03
		4	276.9	1.10	56.68	23.13	212.40	21222.60	99.92	46.27	458.69
		5	211.1	1.17	37.55	17.76	196.75	20543.15	104.41	68.40	300.36
		6	265.4	1.10	41.13	13.67	202.54	20485.62	101.14	42.24	484.93
		7	236.8	1.05	26.55	11.18	161.15	21421.92	132.93	18.10	1183.22
		8	192.9	1.09	29.38	10.03	144.61	21532.19	148.90	28.16	764.56
Aug. 76	527.4	1	60.96	1.33	12.95	11.04	93.02	10963.70	117.86	54.86	199.84
		2	53.37	1.37	11.47	10.68	93.52	9373.97	100.24	59.69	157.04
		3	65.75	1.32	14.80	12.40	96.24	12286.99	127.67	55.30	222.18
		4	63.89	1.41	21.37	14.25	129.88	13323.29	102.58	89.32	149.17
Aug. 76	529.9	1	60.79	1.26	12.05	10.67	73.40	8343.15	113.66	35.99	231.82
		2	64.74	1.26	13.53	12.51	77.96	9189.73	117.88	38.18	240.67
		3	75.24	1.24	12.24	11.68	86.60	9624.66	111.14	40.23	239.22
		4	101.7	1.29	24.98	15.62	136.80	10902.74	79.70	74.03	147.28
		5	151.5	1.19	27.81	13.60	148.64	10915.75	73.44	56.33	193.80
		6	98.57	1.27	20.22	12.70	122.76	9850.68	80.24	61.96	158.99
		7	118	1.27	33.33	13.52	144.43	11482.88	79.50	72.42	158.56
		8	75.56	1.27	18.00	11.67	93.03	10163.01	109.24	46.67	217.76
June 77	518.0	1	1.58	1.52	0.91	1.66	5.71	1287.67	225.40	4.66	276.13
		2	3.78	1.49	1.48	2.32	11.28	1621.23	143.78	8.78	184.69
		3	1.66	1.47	0.49	1.23	4.52	1059.59	234.45	3.43	309.01
		4	6.48	1.22	1.08	1.59	6.85	1839.04	268.36	2.89	636.47

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin *a* mg/m²	Phaeo-phytin Index	Chloro-phyll *b* mg/m²	Chloro-phyll *c* mg/m²	Chloro-phyll *a* mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll *a* mg/m²	Corrected Auto-trophic Index
June 77	527.4	1	1.08	1.48	0.44	1.18	3.08	974.66	316.68	2.38	409.97
		2	0.00	1.79*	0.16	1.13	3.54	956.85	270.44	3.54	270.44
		3	0.32	1.62	0.09	0.68	2.80	701.37	250.64	2.52	277.91
		4	0.28	1.63	0.04	0.49	2.96	665.07	224.64	2.70	246.56
		5	0.39	1.57	0.19	0.75	1.96	649.32	330.99	1.68	385.93
		6	0.37	1.60	0.12	0.66	2.64	693.84	262.78	2.34	296.41
		7	0.79	1.52	0.19	0.62	2.78	760.96	274.14	2.23	341.07
		8	0.33	1.62	0.20	0.71	2.68	642.47	239.70	2.41	266.14
June 77	528.0	1	1.17	1.45	0.25	0.87	2.92	832.88	284.80	2.16	385.96
		2	0.70	1.47	0.16	0.63	1.89	573.29	303.74	1.43	401.90
		3	0.64	1.47	0.22	0.67	1.69	619.86	365.76	1.28	484.22
		4	0.90	1.47	0.10	0.65	2.39	708.90	296.42	1.79	395.55
		5	1.00	1.32	0.25	0.63	1.46	684.93	469.81	0.84	814.20
		6	0.39	1.48	0.03	0.35	1.10	590.41	534.93	0.84	701.84
		7	0.26	1.56	0.00	0.30	1.22	524.66	430.95	1.02	512.31
		8	1.12	1.45	0.28	0.83	2.74	953.42	347.54	2.01	473.95
Sept. 77	496.5	1	2.00	1.66	0.00	8.96	39.11	3636.99	92.98	36.36	100.04
		2	0.76	1.69	0.00	16.76	80.71	6806.16	84.33	77.34	88.00
		3	8.94	1.60	0.00	13.97	62.09	5306.85	85.47	54.52	97.33
		4	4.74	1.58	0.00	6.37	26.88	2666.44	99.21	23.04	115.72
Sept. 77	506.6	1	1.45	1.59	0.20	1.15	8.60	1489.73	173.24	7.46	199.66
		2	2.21	1.45	0.24	0.97	5.46	1343.15	246.17	3.99	336.91
		3	2.02	1.57	1.28	1.41	10.74	1635.62	152.29	9.27	176.41
		4	3.52	1.29	0.08	0.53	4.70	876.03	186.55	2.47	354.83
		5	0.60	1.67	1.14	0.94	12.15	1291.78	106.28	11.46	112.75
		6	3.73	1.55	2.24	1.59	16.69	3086.99	184.97	14.07	219.37
		7	1.89	1.51	0.58	0.54	6.53	957.53	146.66	5.23	183.08

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin *a* mg/m^2	Phaeo-phytin Index	Chloro-phyll *b* mg/m^2	Chloro-phyll *c* mg/m^2	Chloro-phyll *a* mg/m^2	Ash-Free Organic Weight mg/m^2	Auto-trophic Index	Corrected Chloro-phyll *a* mg/m^2	Corrected Auto-trophic Index
Sept. 77	518.0	1	15.44	1.59	7.48	9.48	92.43	6721.23	72.71	80.65	83.34
		2	0.00	2.16*	1.23	6.38	44.94	6254.11	139.17	44.94	139.17
		3	11.39	1.57	1.82	8.19	58.28	6359.59	109.12	49.69	127.99
		4	6.61	1.61	5.27	5.72	52.66	5663.70	107.55	47.31	119.71
		5	8.77	1.56	0.00	5.80	42.39	5745.89	135.56	35.66	161.13
		6	12.05	1.58	3.01	7.78	65.79	5321.92	80.89	56.62	94.00
		7	10.23	1.58	0.07	9.29	55.78	5755.48	103.18	47.84	120.31
Sept. 77	527.4	1	8.27	1.51	0.00	5.28	28.23	5390.41	190.95	22.35	241.21
		2	2.97	1.55	0.00	1.73	13.50	4120.55	305.16	11.27	365.78
		3	5.35	1.54	0.00	2.95	21.29	4103.42	192.75	17.37	236.19
		4	5.63	1.49	0.24	2.97	16.79	5206.16	310.03	12.92	402.95
		5	9.37	1.51	0.00	4.49	31.03	5655.48	182.24	24.32	232.52
		6	5.19	1.51	0.00	2.10	17.44	3347.95	191.96	13.75	243.45
		7	7.92	1.39	0.31	1.90	15.12	3007.53	198.98	9.95	302.31
		8	5.74	1.50	0.77	1.93	18.32	3028.77	165.31	14.36	210.98
Sept. 77	528.0	1	0.51	1.68	0.04	2.28	17.29	1835.62	106.17	16.39	112.03
		2	2.19	1.63	0.60	2.93	20.71	2329.45	112.49	18.74	124.27
		3	0.95	1.66	2.38	2.32	17.62	1760.27	99.91	16.62	105.89
		4	4.31	1.55	0.99	2.56	18.85	1858.22	98.61	15.73	118.15
		5	2.30	1.59	0.97	2.01	14.59	1597.26	109.45	12.80	124.77
		6	1.95	1.62	0.79	2.48	17.57	1800.00	102.44	15.87	113.40
		7	1.68	1.63	1.17	2.16	15.48	1706.16	110.20	14.04	121.48
		8	1.97	1.61	0.78	2.13	14.86	1843.15	124.06	13.24	139.21
Dec. 77	496.5	1	0.00	1.84*	0.00	5.90	37.65	2613.70	69.42	37.65	69.42
		2	0.00	1.83*	0.00	5.76	56.40	3562.33	63.16	56.40	63.16
		3	0.00	1.81*	0.00	7.26	42.84	2906.85	67.85	42.84	67.85
		4	4.66	1.63	0.00	4.18	48.00	4019.18	83.74	43.34	92.73

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Dec. 77	506.6	1	0.00	1.80*	0.15	1.90	18.16	1380.14	76.00	18.16	76.00
		2	0.00	1.85*	0.00	0.05	10.41	1089.73	104.70	10.41	104.70
		3	3.20	1.47	0.09	0.33	8.52	1065.75	125.04	6.34	168.11
		4	0.00	1.89*	0.00	0.00	3.73	326.03	87.44	3.73	87.44
		5	12.19	1.12	0.17	0.95	9.98	1278.77	128.14	2.47	517.96
		6	0.23	1.64	0.00	0.15	2.73	200.00	73.30	2.49	80.41
		7	0.01	1.69	0.02	0.27	1.43	130.82	91.75	1.37	95.38
		8	0.47	1.60	0.07	0.42	3.30	1060.27	321.76	2.91	364.64
Dec. 77	518.0	1	0.00	1.76*	0.00	8.40	70.25	7735.62	110.12	70.25	110.12
		2	1.40	1.68	0.00	6.56	58.81	6003.42	102.08	55.74	107.70
		3	1.43	1.69	0.00	9.22	74.52	4906.16	65.84	70.77	69.32
		4	12.95	1.58	0.00	7.20	76.01	7986.30	105.06	65.40	122.12
		5	0.00	1.83*	0.00	8.68	66.16	4571.23	69.09	66.16	69.09
		6	7.02	1.65	0.00	12.87	98.62	5474.66	55.51	90.52	60.48
		7	0.00	1.73*	0.00	6.33	64.51	4587.67	71.11	64.51	71.11
		8	0.00	1.75*	0.00	6.48	62.62	4882.19	77.97	62.62	77.97
Dec. 77	527.4	1	0.00	1.89*	0.00	9.52	80.86	5169.86	63.93	80.86	63.93
		2	0.41	1.69	0.00	7.02	55.05	4066.44	73.87	52.62	77.28
		3	0.00	1.74*	0.00	6.70	49.89	3469.18	69.53	49.89	69.53
June 82	506.5	1	12.29	1.39	4.43	5.94	23.03	2780.82	120.73	15.36	181.02
		2	2.76	1.52	1.21	3.08	9.91	2513.01	253.71	8.05	312.31
		3	13.39	1.48	3.44	6.22	38.58	5595.21	145.03	29.63	188.86
		4	3.02	1.60	3.78	5.62	20.27	2130.14	105.07	18.10	117.66
		5	6.10	1.49	2.86	5.00	18.48	3089.73	167.22	14.48	213.32
		6	0.00	3.43*	3.77	7.32	23.44	3024.66	129.02	23.44	129.02
		7	0.00	1.79*	4.81	6.53	17.37	2779.45	160.02	17.37	160.02

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
June 82	518.0	1	66.28	1.43	30.78	8.77	149.67	24543.84	163.98	107.62	228.05
		2	114.7	1.33	41.67	10.96	174.16	17110.96	98.25	103.60	165.16
		3	87.91	1.37	33.63	9.86	151.16	29921.23	197.94	96.56	309.88
		4	93.34	1.39	43.47	15.02	178.71	19028.08	106.48	120.70	157.65
		5	89.92	1.41	37.33	10.48	186.54	17831.51	95.59	129.75	137.43
		6	136.6	1.33	23.19	9.84	205.70	20205.48	98.23	119.69	168.81
		7	45.89	1.50	19.83	36.92	141.64	13138.36	92.76	111.37	117.97
June 82	527.4	1	4.99	1.58	2.00	4.73	26.75	7650.00	285.96	23.04	332.00
		2	16.68	1.40	1.58	5.70	33.34	6548.63	196.43	22.49	291.13
June 82	528.0	1	5.05	1.56	4.26	4.33	23.77	808.90	34.03	20.30	39.85
		2	17.70	1.47	5.26	8.10	48.93	7259.59	148.37	37.22	195.07
June 82	529.5	1	7.18	1.33	0.39	2.40	11.01	3655.48	332.07	6.44	567.86
		2	8.23	1.35	1.08	1.69	13.65	1887.67	138.28	8.41	224.39
		3	11.82	1.31	0.82	2.42	16.71	2680.14	160.38	9.24	290.21
		4	23.03	1.50	6.53	10.83	75.02	9815.07	130.84	59.34	165.39
		5	16.18	1.09	0.91	2.60	12.25	4637.67	378.68	2.38	1950.73
		6	4.51	1.23	0.37	1.36	4.99	1768.49	354.50	2.19	805.87
		7	78.86	1.24	6.08	11.12	91.38	15191.10	166.24	42.24	359.60
Aug. 82	496.5	1	20.63	1.39	7.25	4.32	38.40	3051.37	79.46	25.46	119.87
		2	7.42	1.40	2.31	2.52	14.80	893.84	60.41	10.09	88.54
		3	2.00	1.57	1.37	1.15	10.13	607.53	59.95	8.70	69.79
		4	2.52	1.57	1.22	1.80	12.62	743.15	58.87	10.79	68.88
		5	1.52	1.60	1.11	1.42	10.62	693.84	65.33	9.44	73.53
		6	4.61	1.54	3.07	2.99	18.48	1136.99	61.51	15.36	74.01
		7	38.78	1.39	14.43	5.82	73.43	6049.32	82.38	49.08	123.24

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Aug. 82	506.6	1	0.70	1.58	0.48	0.47	3.72	121.92	32.73	3.22	37.88
		2	0.56	1.51	0.33	0.29	1.83	123.29	67.32	1.46	84.27
		3	0.25	1.55	0.15	0.29	1.13	80.82	71.80	0.95	84.99
		4	1.50	1.50	0.28	0.64	4.83	108.22	22.40	3.80	28.45
		5	0.20	1.50	0.09	0.24	0.65	163.01	252.19	0.51	318.35
		6	5.79	1.46	2.13	2.47	15.19	686.99	45.24	1.41	60.20
		7	0.26	1.59	0.25	0.28	1.54	147.95	96.06	1.35	109.32
Aug. 82	518.0	1	25.81	1.49	16.81	5.01	78.17	14355.48	183.65	61.45	233.63
		2	22.12	1.46	13.26	3.03	57.08	5198.63	91.07	43.01	120.86
		3	17.47	1.44	9.33	3.90	40.87	7778.77	190.32	29.85	260.63
		4	11.72	1.50	8.06	3.97	36.09	6918.49	191.69	28.53	242.51
		5	7.02	1.62	7.08	5.20	60.16	6680.82	111.05	54.42	122.75
		6	11.81	1.50	6.13	4.07	38.12	5418.49	142.16	30.28	178.92
		7	20.98	1.48	12.72	2.87	58.25	6366.44	109.29	44.77	142.21
Aug. 82	527.4	1	33.80	1.49	17.99	7.79	102.05	9095.89	89.13	79.88	113.87
		2	22.52	1.18	3.37	1.09	21.67	3550.68	163.85	7.90	449.44
Aug. 82	528.0	1	27.69	1.37	5.74	6.50	49.18	10634.25	216.22	31.60	336.52
		2	12.90	1.51	4.90	5.08	42.51	11847.95	278.69	33.80	350.58
		3	16.37	1.39	4.61	3.97	30.54	6298.63	206.21	20.19	311.97
		4	18.57	1.50	8.15	4.70	58.02	9152.74	157.75	45.65	200.52
		5	19.44	1.44	6.24	5.31	45.03	4651.37	103.29	32.48	143.21
		6	10.75	1.41	3.23	2.90	22.22	5911.64	266.01	15.36	384.83
		7	21.83	1.49	7.60	9.57	63.77	10650.68	167.01	49.29	216.10

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Aug. 82	529.5	1	14.33	1.08	0.86	1.63	10.64	2126.03	199.88	1.90	1117.83
		2	9.88	1.52	3.15	5.33	35.33	4329.45	122.54	28.53	151.76
		3	7.64	1.46	2.93	3.13	19.43	2585.62	133.07	14.48	178.52
		4	9.92	1.47	2.42	5.24	26.76	3823.97	142.90	20.19	189.40
		5	8.60	1.52	2.67	4.35	30.50	3556.16	116.59	24.58	144.69
Dec. 82	496.5	1	25.67	1.33	7.77	5.79	39.22	2589.04	66.01	23.34	110.95
		2	11.18	1.49	6.82	5.76	33.79	2248.63	66.55	26.55	84.68
		3	15.53	1.46	7.30	6.07	38.91	2033.56	52.27	28.97	70.20
		4	11.59	1.52	7.40	6.36	42.34	1454.11	34.35	34.60	42.03
		5	12.23	1.47	9.13	5.96	32.58	2047.95	62.86	24.94	82.10
		6	14.83	1.34	4.60	3.60	23.23	1719.86	74.02	14.04	122.45
		7	7.37	1.52	5.02	3.59	26.39	1428.08	54.11	21.51	66.40
Dec. 82	529.5	1	36.93	1.27	2.91	8.20	46.44	5272.60	113.52	23.34	225.95
		2	31.54	1.45	1.78	12.95	77.42	5371.23	69.37	56.33	95.36
		3	32.67	1.55	4.41	19.72	142.13	5973.97	42.03	118.28	50.51
		4	22.93	1.49	3.82	10.70	68.70	6419.86	93.45	53.11	120.88
		5	18.83	1.55	3.16	14.31	80.40	5506.16	68.49	66.79	82.44
		6	34.04	1.37	2.61	8.79	60.56	6919.18	114.25	38.62	179.14
		7	24.78	1.45	2.51	10.63	61.58	4969.18	80.70	45.06	110.28
Feb. 83	496.5	1	1.98	1.66	0.21	10.21	35.69	3239.04	90.76	33.36	97.10
		2	8.45	1.59	0.00	11.88	51.79	4565.75	88.16	45.06	101.32
		3	11.27	1.56	0.00	9.64	53.63	5887.67	109.79	45.06	130.66
		4	16.98	1.51	0.00	12.68	58.69	5247.26	89.41	46.67	112.43
		5	0.00	1.80*	0.00	19.40	87.92	6881.51	78.27	87.92	78.27
		6	25.51	1.44	0.16	13.55	59.66	5841.10	97.90	42.65	136.96
		7	0.00	1.85*	2.77	10.71	49.86	3621.92	72.63	49.86	72.63

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Feb. 83	518.0	1	0.00	5.78*	0.00	1.19	7.05	321.23	45.59	7.05	45.59
		2	2.25	1.38	0.63	1.23	4.08	195.89	48.02	2.67	73.37
		3	4.24	1.03	0.29	0.87	2.78	267.12	96.07	0.22	1217.23
		4	5.65	0.97	0.34	1.11	3.18	472.60	148.61	.	.
		5	1.22	1.53	0.13	1.31	4.82	482.19	100.04	3.95	122.07
		6	8.65	1.21	0.25	2.27	8.96	780.82	87.18	3.58	217.84
		7	6.74	1.01	0.26	1.02	4.16	401.37	96.57	0.07	5486.89
Feb. 83	527.4	1	7.41	1.06	1.10	1.08	5.18	413.01	79.66	0.73	564.61
		2	3.72	1.10	0.61	0.74	2.82	249.32	88.40	0.59	426.03
		3	1.16	1.27	0.25	0.73	1.44	173.29	120.23	0.73	236.89
		4	1.56	1.15	0.35	0.59	1.37	163.01	118.76	0.44	371.41
		5	2.53	1.10	0.11	0.61	1.98	208.22	104.91	0.44	474.41
		6	2.58	1.10	0.10	0.54	2.02	300.68	149.04	0.44	685.08
		7	4.84	1.01	0.00	0.69	3.03	210.96	69.53	0.07	2883.90
Feb. 83	528.0	1	1.17	1.17	0.20	0.35	1.07	106.16	98.79	0.37	290.26
		2	1.14	1.14	0.14	0.34	0.99	243.84	247.33	0.29	833.33
		3	0.72	1.29	0.09	0.37	0.96	196.58	205.28	0.51	383.90
		4	1.18	1.00	0.11	0.31	0.71	228.08	322.71	0.00	.
		5	0.82	1.00	0.10	0.39	0.49	172.60	353.73	0.00	.
		6	0.78	1.11	0.00	0.32	0.62	141.78	227.85	0.15	969.10
June 83	506.6	1	27.60	1.48	8.96	0.00	80.47	13348.63	165.87	61.96	215.44
		2	10.22	1.63	0.00	6.53	102.07	5869.18	57.50	91.73	63.98
		3	20.52	1.40	12.35	3.81	39.92	6384.25	159.93	27.36	233.36
		4	19.55	1.60	7.03	24.51	130.53	10152.74	77.78	115.07	88.23
		5	7.48	1.67	6.98	30.35	159.00	8599.32	54.08	149.67	57.46
		6	17.06	1.61	4.60	26.05	124.16	7192.47	57.93	110.24	65.24
		7	1.85	1.68	17.71	0.55	61.55	4833.56	78.53	59.54	81.18

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
June 83	518.0	1	0.00	1.73*	4.78	21.87	148.27	13322.60	89.86	148.27	89.86
		2	2.57	1.69	0.00	22.85	154.49	13330.14	86.28	147.25	90.53
Sep. 83	506.6	1	1.05	1.63	0.00	0.14	9.87	1821.23	184.58	8.78	207.48
		2	0.00	1.95*	0.00	0.00	7.78	2504.11	321.91	7.78	321.91
		3	7.86	1.43	0.97	1.27	17.92	5276.03	294.49	12.73	414.51
		4	13.78	1.42	4.93	3.05	29.40	10291.10	349.98	20.63	498.88
Sep. 83	529.5	1	0.66	1.69	0.00	5.58	55.79	3415.75	61.23	53.11	64.32
		2	10.93	1.47	0.00	2.10	29.56	1826.03	61.78	21.95	83.21
Nov. 83	496.5	1	0.00	1.88*	0.00	0.00	32.52	3374.66	103.76	32.52	103.76
		2	7.64	1.59	0.00	3.33	46.76	4710.96	100.74	40.23	117.09
		3	0.00	1.71*	0.00	7.23	61.68	5723.29	92.80	61.68	92.80
		4	17.94	1.47	0.00	1.12	50.51	5307.53	105.08	37.82	140.34
		5	9.74	1.55	0.00	0.85	44.82	4285.62	95.62	37.01	115.78
		6	24.86	1.41	0.00	0.92	52.15	4302.05	82.49	35.40	121.51
Nov. 83	518.0	1	5.39	1.67	0.00	5.93	133.10	10798.63	81.13	124.72	86.58
		2	58.34	1.38	0.00	8.78	107.28	7908.22	73.72	68.40	115.62
		3	0.00	1.71*	0.00	10.23	92.97	9062.33	97.48	92.97	97.48
		4	40.80	1.49	0.00	12.94	124.14	11321.92	91.20	94.95	119.24
		5	31.62	1.52	0.00	12.44	115.10	9039.04	78.53	91.73	98.54
		6	30.34	1.56	0.00	12.49	140.40	14363.01	102.30	116.68	123.10
		7	22.85	1.57	0.00	10.55	114.66	8595.89	74.97	96.56	89.02

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Nov. 83	527.4	1	44.98	1.52	0.00	18.93	160.86	13290.41	82.62	127.94	103.88
		2	42.49	1.43	0.00	7.05	96.03	5360.27	55.82	66.79	80.26
		3	24.30	1.57	0.00	14.84	128.33	7531.51	58.69	108.63	69.33
		4	125.1	1.24	0.00	16.01	143.30	8293.15	57.87	63.57	130.46
		5	23.17	1.55	0.00	9.64	104.30	5223.97	50.09	86.10	60.67
		6	72.18	1.18	0.00	3.40	69.80	3504.11	50.20	24.14	145.16
Nov. 83	528.0	1	68.80	1.26	0.00	4.86	85.11	4626.03	54.35	41.04	112.73
Nov. 83	529.5	1	69.52	1.27	0.00	8.74	89.02	11687.67	131.29	44.26	264.09
		2	50.05	1.38	0.00	11.27	93.92	11737.67	124.98	60.35	194.50
		3	7.48	1.64	0.00	7.34	90.36	5023.97	55.60	82.08	61.21
Mar. 84	506.6	1	0.00	1.91*	0.00	0.50	19.41	1090.41	56.18	19.41	56.18
		2	24.97	1.49	0.00	9.51	74.75	4789.04	64.07	57.06	83.93
		3	5.62	1.65	0.00	10.27	75.82	141345.89	1864.23	69.35	2038.25
		4	16.72	1.53	0.00	6.53	64.08	3668.49	57.25	51.79	70.83
		5	66.19	1.19	0.00	8.11	65.84	3665.75	55.67	24.14	151.86
		6	5.75	1.64	3.08	3.37	68.37	3103.42	45.39	62.76	49.45
		7	0.00	1.81*	0.00	7.68	66.04	4099.32	62.07	66.04	62.07
Mar. 84	518.0	1	30.90	1.51	0.00	19.15	105.41	8432.19	79.99	82.88	101.74
		2	7.97	1.60	0.00	6.51	53.23	2910.27	54.67	46.67	62.36
		3	0.00	1.90*	0.00	0.46	15.29	1471.92	96.25	15.29	96.25
		4	0.00	1.83*	0.00	0.00	13.73	685.62	49.95	13.73	49.95
		5	42.13	1.34	1.14	5.41	67.93	708.22	10.43	40.82	17.35
		6	96.43	1.07	1.49	5.61	70.53	4648.63	65.91	11.41	407.36
		7	3.91	1.60	0.00	0.55	26.14	1454.79	55.66	22.82	63.74

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m^2	Phaeo-phytin Index	Chloro-phyll b mg/m^2	Chloro-phyll c mg/m^2	Chloro-phyll a mg/m^2	Ash-Free Organic Weight mg/m^2	Auto-trophic Index	Corrected Chloro-phyll a mg/m^2	Corrected Auto-trophic Index
Mar. 84	527.4	1	5.56	1.40	0.00	0.87	10.95	678.08	61.95	7.24	93.63
		2	2.28	1.59	0.00	0.68	13.85	597.95	43.17	11.85	50.46
		3	3.20	1.55	0.00	1.00	14.43	585.62	40.57	11.85	49.42
		4	0.00	1.94*	0.00	0.20	11.40	621.92	54.56	11.40	54.56
		5	0.00	1.81*	0.00	2.75	30.72	1519.18	49.44	30.72	49.44
Mar. 84	528.0	1	8.03	1.53	0.00	0.47	31.56	1643.84	52.08	25.46	64.57
		2	8.97	1.08	0.00	0.50	6.76	332.88	49.22	1.17	284.41
		3	16.95	1.06	1.54	0.55	11.82	676.03	57.21	1.54	440.07
		4	8.38	1.12	0.00	0.99	6.99	377.40	53.98	1.76	214.97
		5	0.00	2.44*	0.00	0.00	14.91	.	.	14.91	.
		6	14.78	1.11	0.00	1.14	12.01	699.32	58.21	2.78	251.58
Mar. 84	529.5	1	15.53	1.05	0.00	1.35	10.93	843.15	77.11	1.32	640.35
		2	8.65	1.10	0.00	0.82	6.76	323.97	47.90	1.39	233.10
		3	4.32	1.34	0.00	0.74	6.86	339.73	49.51	4.02	84.44
July 84	496.5	1	5.44	1.60	0.99	0.00	36.50	3306.16	90.57	32.04	103.19
		2	5.55	1.66	0.00	0.00	95.34	12295.89	128.96	88.51	138.92
		3	7.81	1.60	0.00	0.00	56.01	8154.79	145.59	49.08	166.14
		4	13.20	1.44	0.00	0.00	31.09	4204.11	135.24	21.73	193.51
		5	0.64	1.70	4.88	5.09	118.54	10928.08	92.19	114.26	95.64
		6	4.56	1.61	2.33	0.03	33.58	3493.15	104.02	29.85	117.04
		7	0.35	1.69	0.00	0.00	23.55	2565.75	108.94	22.38	114.62
July 84	506.6	1	0.00	1.71*	0.00	0.00	34.79	5297.95	152.29	34.79	152.29
		2	0.89	1.67	0.00	0.00	19.03	4423.97	232.43	17.70	249.91
		3	0.00	1.80*	7.52	0.00	30.39	5798.63	190.82	30.39	190.82
		4	0.00	2.30*	5.79	6.29	44.52	93.84	2.11	44.52	2.11
		5	15.05	1.27	0.44	0.00	18.73	4456.85	238.01	9.22	483.55
		6	1.01	1.67	0.00	0.00	21.69	5597.26	258.11	20.19	277.23
		7	12.73	1.51	0.00	0.00	42.54	8617.12	202.55	33.36	258.33

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
July 84	518.0	1	0.00	1.89*	17.51	15.76	47.29	14612.33	309.00	47.29	309.00
		2	51.02	1.46	18.92	15.95	129.70	18958.22	146.17	96.56	196.34
		3	30.66	1.47	16.60	13.28	80.74	34657.53	429.23	61.15	566.73
		4	0.00	1.81*	4.16	10.97	51.82	16882.19	325.80	51.82	325.80
		5	16.50	1.57	3.91	17.43	83.05	93367.81	1124.20	70.81	1318.57
		6	1.53	1.69	0.57	10.72	79.26	31256.85	394.34	75.64	413.24
		7	18.75	1.46	4.67	11.55	49.36	22310.96	451.97	37.01	602.77
Sep. 84	496.5	1	0.40	1.68	1.93	0.78	14.66	3230.14	220.35	14.04	229.99
		2	7.29	1.26	0.00	0.00	9.25	1967.12	212.72	4.39	448.19
Sep. 84	506.6	1	21.99	1.26	0.00	0.00	26.91	3245.89	120.61	12.73	255.02
		2	22.82	1.33	1.62	1.48	34.74	4954.79	142.61	20.19	245.41
Sep. 84	518.0	1	8.56	1.57	2.74	3.03	45.52	5545.21	121.83	39.06	141.96
		2	113.7	1.02	0.00	9.88	73.49	13605.48	185.14	3.95	3444.31
		3	16.28	1.57	0.00	8.75	86.67	2739.73	31.61	73.74	37.16
		4	0.83	1.66	0.00	0.95	14.82	4697.26	316.87	13.61	345.23
		5	32.22	1.30	1.47	3.19	44.11	6839.04	155.03	23.70	288.56
		6	60.17	1.09	2.88	3.49	45.13	7286.30	161.46	8.34	873.74
		7	20.98	1.49	1.91	8.47	62.21	8286.30	133.20	47.84	173.21
Sep. 84	527.4	1	26.73	1.36	0.00	5.44	45.04	10700.68	237.58	27.65	386.99
		2	8.43	1.41	0.55	1.61	17.38	3892.47	223.94	11.85	328.47
		3	65.66	1.18	9.76	3.67	62.97	5250.00	83.37	22.82	230.03
		4	0.66	1.67	1.98	1.54	17.08	8071.92	472.46	16.24	497.06
		5	2.98	1.55	1.44	0.00	12.65	4673.29	369.41	10.53	443.65
		6	13.21	1.43	0.78	2.05	30.30	7919.86	261.37	21.51	368.26
		7	13.78	1.19	0.00	0.00	14.10	4410.27	312.77	5.27	837.36

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeophytin *a* mg/m²	Phaeophytin Index	Chlorophyll *b* mg/m²	Chlorophyll *c* mg/m²	Chlorophyll *a* mg/m²	Ash-Free Organic Weight mg/m²	Autotrophic Index	Corrected Chlorophyll *a* mg/m²	Corrected Autotrophic Index
Sep. 84	528.0	1	5.18	1.21	0.00	0.00	5.47	6912.33	1264.47	2.19	3149.81
		2	9.96	1.15	0.16	1.39	8.79	6026.71	685.91	2.63	2288.55
		3	6.36	1.38	2.11	1.35	11.45	2716.44	237.24	7.46	364.07
		4	15.32	1.25	1.19	2.36	17.89	6208.22	347.09	8.34	744.46
		5	7.55	1.22	0.00	1.73	8.25	5006.16	606.61	3.51	1425.76
		6	9.92	1.11	0.35	0.85	7.84	6408.22	817.33	1.76	3650.12
		7	8.16	1.04	0.26	0.50	5.41	4633.56	855.96	0.44	10557.1
Dec. 84	496.5	1	17.07	1.47	0.53	7.25	45.83	3460.96	75.52	34.23	101.10
		2	64.87	1.24	0.00	10.91	75.65	5451.37	72.06	34.67	157.22
Dec. 84	506.6	1	50.61	1.34	0.00	11.02	80.07	5205.48	65.01	47.40	109.82
		2	50.78	1.33	0.00	9.89	77.45	5588.36	72.16	44.77	124.83
Dec. 84	527.4	1	18.51	1.58	17.00	7.17	101.76	7846.58	77.11	88.51	88.65
		2	41.64	1.51	20.81	9.52	142.70	8147.26	57.09	114.66	71.05
		3	41.54	1.51	27.37	14.93	139.98	14082.19	100.60	112.65	125.01
		4	32.49	1.56	21.96	7.11	151.67	8219.18	54.19	128.75	63.84
		5	64.67	1.46	27.84	16.04	166.58	13548.63	81.33	124.72	108.63
		6	70.01	1.39	21.03	7.46	134.97	20555.48	152.30	90.52	227.07
		7	68.50	1.41	22.43	17.12	139.05	8830.14	63.50	95.55	92.41
Dec. 84	528.0	1	46.27	1.28	8.75	9.50	59.82	21369.18	357.24	31.18	685.34
		2	83.68	1.40	23.17	14.56	166.87	16071.23	96.31	113.46	141.65
		3	158.5	1.28	46.44	9.15	204.76	17595.89	85.93	107.62	163.50
		4	85.60	1.21	13.84	5.45	88.70	20052.05	226.07	36.21	553.78
		5	58.94	1.28	19.01	8.10	74.08	19945.89	269.24	38.22	521.85

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Dec. 84	529.5	1	41.26	1.38	10.45	5.32	73.97	6293.15	85.08	47.84	131.54
		2	97.06	1.41	40.77	14.62	199.98	17769.18	88.85	138.80	128.02
		3	106.1	1.33	26.26	8.76	160.77	17321.92	107.74	94.55	183.21
		4	68.50	1.38	15.84	10.85	125.02	10271.92	82.16	81.47	126.08
		5	89.82	1.40	31.63	14.66	177.48	11925.34	67.19	120.70	98.80
		6	101.4	1.36	19.88	14.54	169.79	17180.14	101.18	105.61	162.67
		7	99.68	1.39	20.43	15.35	191.66	14375.34	75.00	127.74	112.54
Feb. 85	496.5	1	0.00	1.77*	0.00	0.00	22.22	1878.08	84.52	22.22	84.52
Feb. 85	506.6	1	18.84	1.03	0.00	0.78	12.53	430.82	34.39	0.88	490.79
		2	3.38	1.16	0.00	0.20	3.17	1035.62	326.53	1.02	1011.24
Feb. 85	528.0	1	7.78	1.11	0.00	0.56	6.21	557.53	89.73	1.39	401.14
		2	15.97	1.06	0.00	1.22	11.27	828.77	73.51	1.39	596.29
		3	3.20	1.22	0.00	0.24	3.52	215.75	61.30	1.46	147.47
		4	1.29	1.35	0.00	0.00	2.20	311.64	141.59	1.32	236.68
		5	1.03	1.55	0.00	0.03	4.55	319.18	70.11	3.73	85.55
		6	5.33	1.11	0.00	0.12	4.38	524.66	119.69	1.02	512.31
		7	6.23	1.12	0.00	0.29	5.16	.	.	1.24	.
Feb. 85	529.5	1	0.86	1.41	0.00	0.46	1.81	206.16	114.04	1.24	165.79
		2	4.15	1.02	0.00	0.40	2.69	167.12	62.11	0.15	1142.32
May 85	496.5	1	22.05	1.37	0.00	0.00	38.75	8255.48	213.02	24.14	341.99
		2	1.45	1.66	0.00	0.00	25.55	5714.38	223.68	23.34	244.88

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
May 85	506.6	1	0.00	1.80*	0.00	0.00	28.83	4100.68	142.22	28.83	142.22
		2	2.90	1.66	0.00	1.17	50.37	6756.85	134.15	46.67	144.78
		3	5.79	1.50	0.00	0.00	18.86	3489.73	184.99	14.48	240.94
		4	0.72	1.68	0.00	0.00	33.29	4220.55	126.80	31.38	134.49
		5	31.62	1.40	1.10	1.20	61.80	6752.74	109.27	41.04	164.55
		6	30.17	1.40	0.00	3.97	60.52	6930.14	114.51	40.23	172.25
		7	2.74	1.66	0.00	0.00	52.78	6258.90	118.59	49.08	127.51
May 85	518.0	1	36.29	1.41	12.87	0.92	72.92	28833.56	395.40	49.89	577.96
		2	42.81	1.20	9.62	0.00	42.93	29279.45	682.03	16.90	1732.74
		3	35.08	1.44	17.15	3.52	81.85	32579.45	398.06	59.54	547.14
		4	79.18	1.24	15.30	6.26	88.83	25983.56	292.50	40.23	645.83
		5	40.72	1.47	25.84	3.91	107.99	19228.77	178.06	82.08	234.28
		6	28.08	1.46	15.55	4.21	72.68	26264.38	361.39	54.72	480.01
		7	46.43	1.45	19.82	8.00	113.57	22295.89	196.33	83.68	266.43
May 85	527.4	1	22.95	1.29	3.09	4.01	31.04	3010.27	96.99	16.68	180.49
		2	16.02	1.41	1.81	5.10	32.81	7252.74	221.05	22.38	324.01
		3	17.64	1.49	2.37	10.69	54.65	12467.12	228.14	42.57	292.84
		4	15.27	1.46	3.48	6.73	39.04	11450.00	293.29	28.97	395.27
		5	0.48	1.68	1.64	4.16	16.52	13446.58	814.07	15.80	851.02
		6	39.76	0.93	3.69	7.20	20.26	10300.00	508.33	.	.
		7	3.99	1.58	1.13	5.12	21.42	8177.40	381.72	18.43	443.60
May 85	528.0	1	13.39	1.47	3.34	11.31	36.93	18217.12	493.23	28.09	648.53
		2	30.20	1.33	8.73	15.19	44.91	20409.59	454.44	26.33	775.02
		3	36.12	1.06	6.06	11.32	25.09	21543.84	858.52	3.51	6135.69
		4	44.86	1.25	11.90	14.88	51.80	19420.55	374.93	24.58	790.14
		5	4.70	1.59	0.65	4.09	30.10	16582.19	550.91	26.33	629.68
		6	23.31	1.33	3.01	12.74	35.25	18647.26	528.93	20.63	903.96
		7	60.79	1.08	7.31	13.00	45.05	18953.42	420.74	8.34	2272.82

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
May 85	529.5	1	11.19	1.51	1.38	6.68	38.08	7739.04	203.24	30.28	255.55
		2	20.80	1.41	0.41	4.44	42.68	4657.53	109.13	28.97	160.78
Aug. 85	496.5	1	2.33	1.56	2.28	0.57	11.26	6418.49	570.14	9.66	664.72
		2	9.13	1.42	4.92	0.08	19.31	1954.79	101.22	13.61	143.67
Aug. 85	506.6	1	0.00	2.08*	0.00	0.00	5.08	8098.63	1595.16	5.08	1595.16
		2	0.53	1.42	0.19	0.14	1.14	9568.49	8392.00	0.80	11891.4
		3	0.00	1.71*	0.25	0.08	1.26	3505.48	2778.56	1.26	2778.56
		4	2.73	1.16	0.69	0.18	2.45	5250.68	2147.15	0.80	6525.37
		5	1.64	1.17	0.44	0.19	1.50	.	.	0.51	.
		6	0.45	1.31	0.10	0.14	0.65	6456.16	9983.05	0.37	17651.7
Aug. 85	518.0	1	8.43	1.45	3.65	1.41	20.33	1730.82	85.13	14.92	115.99
		2	3.60	1.66	11.32	2.06	60.06	8818.49	146.84	56.62	155.75
		3	2.68	1.63	3.28	1.99	25.04	7582.88	302.78	22.82	332.25
		4	0.00	1.74*	0.52	0.66	5.39	5226.71	969.46	5.39	969.46
		5	0.26	1.68	1.80	1.58	8.66	2827.40	326.59	8.34	339.05
		6	6.52	1.21	0.85	0.52	6.87	7408.22	1078.66	2.85	2596.75
		7	1.52	1.56	0.65	0.50	6.95	10539.73	1517.42	5.85	1801.03
Aug. 85	527.4	1	40.55	1.36	4.18	8.15	68.98	207.53	3.01	43.01	4.82
		2	3.60	1.62	3.43	2.82	31.96	260.27	8.14	28.97	8.98
		3	33.01	1.25	2.98	4.77	38.54	272.60	7.07	18.00	15.15
		4	8.78	1.50	0.64	1.27	28.07	330.82	11.79	21.95	15.07
		5	25.63	1.48	5.39	7.09	72.09	252.74	3.51	54.86	4.61
		6	0.00	1.82*	3.21	2.57	31.79	953.42	29.99	31.79	29.99
		7	0.00	1.72*	6.42	7.01	95.01	9330.14	98.20	95.01	98.20

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Aug. 85	528.0	1	28.88	1.36	9.81	3.54	48.72	5228.77	107.33	30.72	170.19
		2	13.83	1.48	2.56	4.82	40.07	1782.19	44.48	30.72	58.01
		3	0.00	1.72*	1.64	3.29	30.22	393.15	13.01	30.22	13.01
		4	3.82	1.58	0.75	1.95	20.93	622.60	29.75	18.00	34.60
		5	17.69	1.46	3.64	4.46	45.99	5880.82	127.86	34.23	171.78
		6	90.98	1.18	0.90	10.66	88.15	4059.59	46.05	31.60	128.46
		7	55.30	1.28	8.16	8.59	71.29	292.47	4.10	36.87	7.93
Nov. 85	496.5	1	0.61	1.67	2.26	0.00	12.96	1107.53	85.44	12.29	90.12
		2	13.80	1.05	1.43	0.81	9.29	1061.64	114.29	0.95	1116.39
		3	11.10	1.33	3.19	0.00	17.01	1610.27	94.64	10.09	159.52
		4	11.58	1.15	1.96	0.56	10.25	1012.33	98.75	3.22	314.52
		5	0.97	1.67	5.86	0.00	20.18	1968.49	97.52	19.31	101.93
		6	11.77	1.05	0.54	0.71	8.05	854.11	106.15	0.88	973.00
		7	0.00	1.77*	1.72	0.00	14.13	903.42	63.93	14.13	63.93
Nov. 85	506.6	1	3.14	1.56	4.05	0.00	14.15	983.56	69.51	12.07	81.49
		2	14.08	1.31	4.20	0.00	19.98	1136.30	56.87	11.27	100.87
		3	0.97	1.67	5.92	0.00	26.03	2225.34	85.50	24.94	89.21
		4	14.24	1.35	1.77	0.00	23.59	1691.78	71.70	14.48	116.80
		5	0.97	1.65	1.44	0.00	14.69	1062.33	72.29	13.68	77.66
		6	14.16	1.52	5.62	2.25	50.77	3422.60	67.41	41.04	83.40
		7	0.00	1.89*	0.76	0.00	6.70	712.33	106.26	6.70	106.26
Nov. 85	518.0	1	4.83	1.67	18.94	7.98	119.14	6473.97	54.34	113.46	57.06
		2	37.09	1.46	1.33	8.41	96.77	5010.27	51.78	71.61	69.96

Appendix 6-C (Continued)

Quarter	River Mile	Replicate Number	Phaeo-phytin a mg/m²	Phaeo-phytin Index	Chloro-phyll b mg/m²	Chloro-phyll c mg/m²	Chloro-phyll a mg/m²	Ash-Free Organic Weight mg/m²	Auto-trophic Index	Corrected Chloro-phyll a mg/m²	Corrected Auto-trophic Index
Nov. 85	527.4	1	15.39	1.56	10.65	0.00	72.26	3430282.88	47469.77	61.36	55908.6
		2	0.00	1.72*	3.99	2.94	63.96	4069.18	63.62	63.96	63.62
		3	41.76	1.37	5.34	2.93	73.48	4737.67	64.47	46.67	101.51
		4	18.59	1.42	5.71	0.00	40.14	2821.92	70.30	28.16	100.20
		5	2.90	1.67	6.39	4.53	67.19	4828.77	71.86	63.57	75.96
		6	36.61	1.44	10.61	3.37	85.79	8050.68	93.84	61.96	129.94
		7	0.00	1.84*	8.88	1.22	70.13	4424.66	63.09	70.13	63.09
Nov. 85	528.0	1	22.85	1.35	3.44	2.94	37.87	2647.95	69.93	23.34	113.47
		2	17.46	1.53	14.60	1.12	67.97	4623.29	68.02	56.33	82.08
		3	15.29	1.38	7.48	0.00	27.98	1473.97	52.67	18.51	79.64
		4	82.48	1.04	8.48	2.03	54.68	10945.21	200.16	4.83	2267.05
		5	11.43	1.62	14.71	3.96	96.82	7967.12	82.29	87.71	90.84
		6	11.10	1.63	5.42	13.15	108.09	5711.64	52.84	98.17	58.18
		7	11.43	1.61	16.93	4.30	90.79	6000.00	66.08	82.08	73.10
Nov. 85	529.5	1	52.46	1.45	20.82	5.93	125.55	11718.49	93.34	91.73	127.75
		2	62.26	1.48	40.62	0.35	172.65	12140.41	70.32	132.77	91.44

*This value is beyond the theoretical limit of 1.70 for phaeophytin indices.

APPENDIX 6-D

STATISTICAL SUMMARY OF PERIPHYTON CHLOROPHYLL/BIOMASS ANALYSES, WATTS BAR NUCLEAR PLANT PREOPERATIONAL MONITORING (1976-1985), CHICKAMAUGA RESERVOIR

Appendix 6-D. Statistical Summary of Periphyton Chlorophyll/Biomass Analyses, Watts Bar Nuclear Plant Preoperational Monitoring (1976-1985), Chickamauga Reservoir.

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
May 76	506.6	PAM2[2]	8	23.98	20.95	8.60	74.77	7.41	87.36
		PI[3]	8	1.47	0.13	1.16	1.58	0.05	8.71
		CBM2[4]	8	2.72	1.55	0.00	4.20	0.55	56.94
		CCM2[5]	8	8.01	1.18	6.26	9.91	0.42	14.71
		CAM2[6]	8	57.52	7.68	49.58	68.69	2.71	13.35
		AFOW[7]	8	5278.08	598.42	4623.29	6458.22	211.57	11.34
		AI[8]	8	92.09	5.12	82.61	96.92	1.81	5.56
		CCAM2[9]	8	41.61	9.00	22.59	53.55	3.18	21.63
		CAI[10]	8	137.12	60.66	102.06	285.95	21.45	44.24
May 76	518.0	PAM2	8	28.42	4.07	21.55	33.44	1.44	14.33
		PI	8	1.43	0.02	1.40	1.46	0.01	1.42
		CBM2	8	9.14	1.40	7.12	11.76	0.49	15.27
		CCM2	8	7.22	0.78	6.23	8.61	0.28	10.80
		CAM2	8	64.39	7.14	54.88	79.33	2.52	11.09
		AFOW	8	5699.49	601.80	4800.68	6311.64	212.77	10.56
		AI	8	88.91	8.84	77.91	98.47	3.12	9.94
		CCAM2	8	46.08	5.22	40.82	57.50	1.85	11.33
		CAI	8	124.31	13.35	108.30	142.09	4.72	10.74
May 76	527.0	PAM2	8	28.71	28.59	2.20	63.95	10.11	99.60
		PI	8	1.46	0.11	1.27	1.58	0.04	7.72
		CBM2	8	6.33	6.98	0.00	18.02	2.47	110.17
		CCM2	8	7.01	5.99	1.36	14.88	2.12	85.54
		CAM2	8	54.02	46.11	10.31	106.11	16.30	85.34
		AFOW	8	5637.07	4883.73	983.56	11154.11	1726.66	86.64
		AI	8	101.30	13.90	82.75	122.19	4.91	13.72
		CCAM2	8	35.72	29.48	8.49	72.97	10.42	82.53
		CAI	8	143.20	41.59	95.80	224.95	14.70	29.04

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
May 76	528.0	PAM2	8	31.29	9.76	21.24	52.68	3.45	31.20
		PI	8	1.45	0.03	1.38	1.49	0.01	2.33
		CBM2	8	8.96	3.18	5.31	12.65	1.12	35.51
		CCM2	8	11.96	1.95	9.07	14.13	0.69	16.27
		CAM2	8	76.59	13.13	58.88	95.96	4.64	17.14
		AFOW	8	7919.01	929.84	6747.26	9139.04	328.75	11.74
		AI	8	104.53	10.07	93.27	118.80	3.56	9.63
		CCAM2	8	56.20	8.54	44.74	67.76	3.02	15.20
		CAI	8	142.27	15.40	119.89	166.50	5.44	10.82
May 76	529.5	PAM2	8	38.89	11.10	20.00	57.41	3.92	28.53
		PI	8	1.33	0.07	1.22	1.43	0.03	5.37
		CBM2	8	10.62	2.04	7.53	14.43	0.72	19.18
		CCM2	8	8.08	0.60	7.28	8.97	0.21	7.37
		CAM2	8	57.33	7.03	45.42	64.91	2.49	12.27
		AFOW	8	5568.75	481.68	4738.36	6119.86	170.30	8.65
		AI	8	97.65	5.94	87.44	104.32	2.10	6.08
		CCAM2	8	33.24	6.24	24.64	42.56	2.21	18.77
		CAI	8	172.52	34.69	135.62	228.97	12.27	20.11
Aug. 76	506.6	PAM2	8	33.40	13.17	19.32	51.83	4.66	39.43
		PI	8	1.42	0.08	1.25	1.52	0.03	5.47
		CBM2	8	0.76	1.19	0.00	2.80	0.42	155.18
		CCM2	8	12.31	3.56	7.79	16.90	1.26	28.89
		CAM2	8	70.42	18.95	42.78	96.67	6.70	26.91
		AFOW	8	7670.80	1103.31	5877.40	9257.53	390.08	14.38
		AI	8	113.91	23.61	80.46	151.17	8.35	20.73
		CCAM2	8	48.37	14.81	27.91	64.52	5.23	30.61
		CAI	8	169.90	46.79	123.93	258.00	16.54	27.54

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Aug. 76	518.0	PAM2	8	216.10	49.16	120.30	276.90	17.38	22.75
		PI	8	1.13	0.10	1.05	1.37	0.04	8.95
		CBM2	8	36.45	9.44	26.55	56.68	3.34	25.91
		CCM2	8	14.34	4.36	10.03	23.13	1.54	30.41
		CAM2	8	179.96	27.82	144.61	212.40	9.84	15.46
		AFOW	8	20588.53	803.06	19105.48	21532.19	283.93	3.90
		AI	8	117.13	20.68	92.19	148.90	7.31	17.66
		CCAM2	8	49.16	36.75	18.10	131.76	12.99	74.76
		CAI	8	590.21	319.28	145.00	1183.22	112.88	54.10
Aug. 76	527.4	PAM2	4	60.99	5.45	53.37	65.75	2.72	8.94
		PI	4	1.36	0.04	1.32	1.41	0.02	2.95
		CBM2	4	15.15	4.37	11.47	21.37	2.18	28.83
		CCM2	4	12.09	1.62	10.68	14.25	0.81	13.36
		CAM2	4	103.17	17.86	93.02	129.88	8.93	17.32
		AFOW	4	11486.99	1707.89	9373.97	13323.29	853.94	14.87
		AI	4	112.09	13.00	100.24	127.67	6.50	11.60
		CCAM2	4	64.79	16.49	54.86	89.32	8.25	25.46
		CAI	4	182.06	34.80	149.17	222.18	17.40	19.12
Aug. 76	529.9	PAM2	8	93.26	30.73	60.79	151.52	10.86	32.95
		PI	8	1.26	0.03	1.19	1.29	0.01	2.43
		CBM2	8	20.27	7.86	12.05	33.33	2.78	38.77
		CCM2	8	12.75	1.52	10.67	15.62	0.54	11.95
		CAM2	8	110.46	31.08	73.40	148.64	10.99	28.13
		AFOW	8	10059.08	1029.28	8343.15	11482.88	363.91	10.23

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	8	95.60	18.86	73.44	117.88	6.67	19.73
		CCAM2	8	53.23	15.22	35.99	74.03	5.38	28.60
		CAI	8	198.51	39.13	147.28	240.67	13.84	19.71
June 77	518.0	PAM2	4	3.37	2.31	1.58	6.48	1.15	68.41
		PI	4	1.42	0.14	1.22	1.52	0.07	9.90
		CBM2	4	0.99	0.41	0.49	1.48	0.21	41.48
		CCM2	4	1.70	0.45	1.23	2.32	0.23	26.62
		CAM2	4	7.09	2.95	4.52	11.28	1.47	41.59
		AFOW	4	1451.88	346.14	1059.59	1839.04	173.07	23.84
		AI	4	218.00	52.82	143.78	268.36	26.41	24.23
		CCAM2	4	4.94	2.66	2.89	8.78	1.33	53.93
		CAI	4	351.57	197.08	184.69	636.47	98.54	56.06
June 77	527.4	PAM2	8	0.44	0.33	0.00	1.08	0.12	75.34
		PI	8	1.60	0.09	1.48	1.79	0.03	5.74
		CBM2	8	0.18	0.12	0.04	0.44	0.04	67.32
		CCM2	8	0.78	0.25	0.49	1.18	0.09	31.53
		CAM2	8	2.80	0.45	1.96	3.54	0.16	15.90
		AFOW	8	755.57	134.99	642.47	974.66	47.73	17.87
		AI	8	271.25	36.46	224.64	330.99	12.89	13.44
		CCAM2	8	2.48	0.52	1.68	3.54	0.18	21.05
		CAI	8	311.80	60.27	246.56	409.97	21.31	19.33

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
June 77	528.0	PAM2	8	0.77	0.34	0.26	1.17	0.12	43.47
		PI	8	1.46	0.07	1.32	1.56	0.02	4.52
		CBM2	8	0.16	0.11	0.00	0.28	0.04	67.02
		CCM2	8	0.62	0.20	0.30	0.87	0.07	33.08
		CAM2	8	1.93	0.69	1.10	2.92	0.24	35.80
		AFOW	8	686.04	144.35	524.66	953.42	51.04	21.04
		AI	8	379.24	90.85	284.80	534.93	32.12	23.96
		CCAM2	8	1.42	0.52	0.84	2.16	0.18	36.44
		CAI	8	521.24	156.05	385.96	814.20	55.17	29.94
Sept. 77	496.5	PAM2	4	4.11	3.62	0.76	8.94	1.81	88.20
		PI	4	1.63	0.05	1.58	1.69	0.03	3.21
		CBM2	4	0.00	0.00	0.00	0.00	0.00	.
		CCM2	4	11.52	4.71	6.37	16.76	2.35	40.90
		CAM2	4	52.20	23.97	26.88	80.71	11.98	45.91
		AFOW	4	4604.11	1828.73	2666.44	6806.16	914.37	39.72
		AI	4	90.50	6.96	84.33	99.21	3.48	7.70
		CCAM2	4	47.82	23.54	23.04	77.34	11.77	49.22
		CAI	4	100.27	11.52	88.00	115.72	5.76	11.49
Sept. 77	506.6	PAM2	7	2.20	1.11	0.60	3.73	0.42	50.25
		PI	7	1.52	0.12	1.29	1.67	0.05	7.97
		CBM2	7	0.82	0.78	0.08	2.24	0.29	94.71
		CCM2	7	1.02	0.40	0.53	1.59	0.15	39.60
		CAM2	7	9.27	4.26	4.70	16.69	1.61	45.99
		AFOW	7	1525.83	739.81	876.03	3086.99	279.62	48.49
		AI	7	170.88	43.25	106.28	246.17	16.35	25.31
		CCAM2	7	7.71	4.17	2.47	14.07	1.58	54.15
		CAI	7	226.14	88.28	112.75	354.83	33.37	39.04

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Sept. 77	518.0	PAM2	7	9.21	4.91	0.00	15.44	1.85	53.26
		PI	7	1.66	0.22	1.56	2.16	0.08	13.09
		CBM2	7	2.70	2.79	0.00	7.48	1.05	103.43
		CCM2	7	7.52	1.58	5.72	9.48	0.60	20.99
		CAM2	7	58.90	16.78	42.39	92.43	6.34	28.49
		AFOW	7	5974.56	484.21	5321.92	6721.23	183.02	8.10
		AI	7	106.88	24.92	72.71	139.17	9.42	23.32
		CCAM2	7	51.82	14.16	35.66	80.65	5.35	27.33
		CAI	7	120.81	26.26	83.34	161.13	9.93	21.74
Sept. 77	527.4	PAM2	8	6.31	2.07	2.97	9.37	0.73	32.79
		PI	8	1.50	0.05	1.39	1.55	0.02	3.26
		CBM2	8	0.16	0.28	0.00	0.77	0.10	167.23
		CCM2	8	2.92	1.32	1.73	5.28	0.47	45.17
		CAM2	8	20.22	6.28	13.50	31.03	2.22	31.09
		AFOW	8	4232.53	1074.03	3007.53	5655.48	379.73	25.38
		AI	8	217.17	56.73	165.31	310.03	20.06	26.12
		CCAM2	8	15.79	5.17	9.95	24.32	1.83	32.77
		CAI	8	279.42	70.45	210.98	402.95	24.91	25.21
Sept. 77	528.0	PAM2	8	1.98	1.13	0.51	4.31	0.40	56.87
		PI	8	1.62	0.04	1.55	1.68	0.01	2.46
		CBM2	8	0.96	0.66	0.04	2.38	0.24	68.95
		CCM2	8	2.36	0.29	2.01	2.93	0.10	12.46
		CAM2	8	17.12	2.09	14.59	20.71	0.74	12.19
		AFOW	8	1841.27	215.37	1597.26	2329.45	76.15	11.70
		AI	8	107.91	8.22	98.61	124.06	2.91	7.62
		CCAM2	8	15.43	1.97	12.80	18.74	0.70	12.78
		CAI	8	119.90	10.15	105.89	139.21	3.59	8.47

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Dec. 77	496.5	PAM2	4	1.17	2.33	0.00	4.66	1.17	200.00
		PI	4	1.78	0.10	1.63	1.84	0.05	5.59
		CBM2	4	0.00	0.00	0.00	0.00	0.00	.
		CCM2	4	5.78	1.26	4.18	7.26	0.63	21.84
		CAM2	4	46.22	7.99	37.65	56.40	4.00	17.29
		AFOW	4	3275.51	634.88	2613.70	4019.18	317.44	19.38
		AI	4	71.04	8.87	63.16	83.74	4.44	12.49
		CCAM2	4	45.06	7.99	37.65	56.40	3.99	17.72
		CAI	4	73.29	13.23	63.16	92.73	6.62	18.05
Dec. 77	506.6	PAM2	8	2.01	4.25	0.00	12.19	1.50	211.39
		PI	8	1.63	0.25	1.12	1.89	0.09	15.39
		CBM2	8	0.06	0.07	0.00	0.17	0.02	112.18
		CCM2	8	0.51	0.64	0.00	1.90	0.22	124.93
		CAM2	8	7.28	5.61	1.43	18.16	1.98	77.08
		AFOW	8	816.44	509.67	130.82	1380.14	180.20	62.43
		AI	8	126.02	81.69	73.30	321.76	28.88	64.83
		CCAM2	8	5.98	5.71	1.37	18.16	2.02	95.45
		CAI	8	186.83	164.84	76.00	517.96	58.28	88.23
Dec. 77	518.0	PAM2	8	2.85	4.72	0.00	12.95	1.67	165.62
		PI	8	1.71	0.08	1.58	1.83	0.03	4.40
		CBM2	8	0.00	0.00	0.00	0.00	0.00	.
		CCM2	8	8.22	2.18	6.33	12.87	0.77	26.52
		CAM2	8	71.44	12.44	58.81	98.62	4.40	17.42
		AFOW	8	5768.41	1377.72	4571.23	7986.30	487.10	23.88
		AI	8	82.10	20.67	55.51	110.12	7.31	25.17
		CCAM2	8	68.25	10.15	55.74	90.52	3.59	14.87
		CAI	8	85.99	23.48	60.48	122.12	8.30	27.31

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Dec. 77	527.4	PAM2	3	0.14	0.24	0.00	0.41	0.14	173.21
		PI	3	1.77	0.10	1.69	1.89	0.06	5.62
		CBM2	3	0.00	0.00	0.00	0.00	0.00	.
		CCM2	3	7.75	1.54	6.70	9.52	0.89	19.89
		CAM2	3	61.94	16.59	49.89	80.86	9.58	26.79
		AFOW	3	4235.16	862.81	3469.18	5169.86	498.14	20.37
		AI	3	69.11	4.98	63.93	73.87	2.88	7.21
		CCAM2	3	61.13	17.15	49.89	80.86	9.90	28.06
		CAI	3	70.25	6.70	63.93	77.28	3.87	9.54
June 82	506.6	PAM2	7	5.36	5.52	0.00	13.39	2.09	102.87
		PI	7	1.82	0.72	1.39	3.43	0.27	39.88
		CBM2	7	3.47	1.18	1.21	4.81	0.45	34.11
		CCM2	7	5.67	1.35	3.08	7.32	0.51	23.85
		CAM2	7	21.58	8.76	9.91	38.58	3.31	40.57
		AFOW	7	3130.43	1133.96	2130.14	5595.21	428.60	36.22
		AI	7	154.40	48.92	105.07	253.71	18.49	31.68
		CCAM2	7	18.06	6.87	8.05	29.63	2.60	38.06
		CAI	7	186.03	64.97	117.66	312.31	24.56	34.92
June 82	518.0	PAM2	7	90.66	29.72	45.89	136.59	11.23	32.78
		PI	7	1.39	0.06	1.33	1.50	0.02	4.28
		CBM2	7	32.84	8.93	19.83	43.47	3.37	27.19
		CCM2	7	14.55	10.06	8.77	36.92	3.80	69.16
		CAM2	7	169.65	23.14	141.64	205.70	8.75	13.64
		AFOW	7	20254.21	5473.31	13138.36	29921.23	2068.72	27.02
		AI	7	121.89	41.74	92.76	197.94	15.78	34.24
		CCAM2	7	112.76	11.36	96.56	129.75	4.29	10.08
		CAI	7	183.56	65.31	117.97	309.88	24.69	35.58

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
June 82	527.4	PAM2	2	10.84	8.26	4.99	16.68	5.84	76.26
		PI	2	1.49	0.12	1.40	1.58	0.09	8.24
		CBM2	2	1.79	0.30	1.58	2.00	0.21	16.87
		CCM2	2	5.22	0.69	4.73	5.70	0.48	13.14
		CAM2	2	30.04	4.66	26.75	33.34	3.29	15.50
		AFOW	2	7099.32	778.79	6548.63	7650.00	550.68	10.97
		AI	2	241.20	63.31	196.43	285.96	44.77	26.25
		CCAM2	2	22.77	0.39	22.49	23.04	0.27	1.70
		CAI	2	311.56	28.90	291.13	332.00	20.43	9.27
June 82	528.0	PAM2	2	11.37	8.95	5.05	17.70	6.33	78.67
		PI	2	1.52	0.06	1.47	1.56	0.04	4.02
		CBM2	2	4.76	0.70	4.26	5.26	0.50	14.81
		CCM2	2	6.21	2.67	4.33	8.10	1.89	42.95
		CAM2	2	36.35	17.79	23.77	48.93	12.58	48.95
		AFOW	2	4034.25	4561.32	808.90	7259.59	3225.34	113.07
		AI	2	91.20	80.85	34.03	148.37	57.17	88.65
		CCAM2	2	28.76	11.96	20.30	37.22	8.46	41.59
		CAI	2	117.46	109.76	39.85	195.07	77.61	93.44
June 82	529.5	PAM2	7	21.40	26.09	4.51	78.86	9.86	121.89
		PI	7	1.29	0.13	1.09	1.50	0.05	9.86
		CBM2	7	2.31	2.74	0.37	6.53	1.04	118.82
		CCM2	7	4.63	4.36	1.36	11.12	1.65	94.04
		CAM2	7	32.14	35.37	4.99	91.38	13.37	110.05
		AFOW	7	5662.23	5023.67	1768.49	15191.10	1898.77	88.72
		AI	7	237.28	111.66	130.84	378.68	42.21	47.06
		CCAM2	7	18.61	22.70	2.19	59.34	8.58	121.98
		CAI	7	623.44	625.54	165.39	1950.73	236.43	100.34

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Aug. 82	496.5	PAM2	7	11.07	13.91	1.52	38.78	5.26	125.68
		PI	7	1.49	0.10	1.39	1.60	0.04	6.42
		CBM2	7	4.39	4.92	1.11	14.43	1.86	111.89
		CCM2	7	2.86	1.69	1.15	5.82	0.64	59.20
		CAM2	7	25.50	23.28	10.13	73.43	8.80	91.29
		AFOW	7	1882.29	2024.78	607.53	6049.32	765.30	107.57
		AI	7	66.85	9.86	58.87	82.38	3.73	14.76
		CCAM2	7	18.42	14.73	8.70	49.08	5.57	79.97
		CAI	7	88.27	23.66	68.88	123.24	8.94	26.81
Aug. 82	506.6	PAM2	7	1.32	2.02	0.20	5.79	0.76	152.73
		PI	7	1.53	0.05	1.46	1.59	0.02	2.97
		CBM2	7	0.53	0.72	0.09	2.13	0.27	134.99
		CCM2	7	0.67	0.80	0.24	2.47	0.30	120.37
		CAM2	7	4.13	5.10	0.65	15.19	1.93	123.59
		AFOW	7	204.60	214.36	80.82	686.99	81.02	104.77
		AI	7	83.96	78.30	22.40	252.19	29.60	93.26
		CCAM2	7	3.24	3.80	0.51	11.41	1.44	117.01
		CAI	7	103.35	98.93	28.45	318.35	37.39	95.72
Aug. 82	518.0	PAM2	7	16.70	6.75	7.02	25.81	2.55	40.43
		PI	7	1.50	0.06	1.44	1.62	0.02	3.84
		CBM2	7	10.49	3.88	6.13	16.81	1.47	37.04
		CCM2	7	4.01	0.89	2.87	5.20	0.33	22.09
		CAM2	7	52.68	15.18	36.09	78.17	5.74	28.82
		AFOW	7	7531.02	3135.59	5198.63	14355.48	1185.14	41.64
		AI	7	145.61	42.95	91.07	191.69	16.23	29.50
		CCAM2	7	41.76	12.96	28.53	61.45	4.90	31.03
		CAI	7	185.93	59.50	120.86	260.63	22.49	32.00

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Aug. 82	527.4	PAM2	2	28.16	7.98	22.52	33.80	5.64	28.33
		PI	2	1.34	0.22	1.18	1.49	0.16	16.40
		CBM2	2	10.68	10.34	3.37	17.99	7.31	96.77
		CCM2	2	4.44	4.73	1.09	7.79	3.35	106.69
		CAM2	2	61.86	56.84	21.67	102.05	40.19	91.88
		AFOW	2	6323.29	3921.05	3550.68	9095.89	2772.60	62.01
		AI	2	126.49	52.83	89.13	163.85	37.36	41.77
		CCAM2	2	43.89	50.90	7.90	79.88	35.99	115.97
		CAI	2	281.65	237.28	113.87	449.44	167.78	84.25
Aug. 82	528.0	PAM2	7	18.22	5.65	10.75	27.69	2.14	31.03
		PI	7	1.44	0.05	1.37	1.51	0.02	3.78
		CBM2	7	5.78	1.72	3.23	8.15	0.65	29.78
		CCM2	7	5.43	2.14	2.90	9.57	0.81	39.38
		CAM2	7	44.47	14.56	22.22	63.77	5.50	32.73
		AFOW	7	8449.61	2803.42	4651.37	11847.95	1059.59	33.18
		AI	7	199.31	62.01	103.29	278.69	23.44	31.11
		CCAM2	7	32.62	12.26	15.36	49.29	4.63	37.59
		CAI	7	277.68	90.61	143.21	384.83	34.25	32.63
Aug. 82	529.5	PAM2	5	10.07	2.56	7.64	14.33	1.15	25.45
		PI	5	1.41	0.19	1.08	1.52	0.08	13.14
		CBM2	5	2.41	0.91	0.86	3.15	0.41	37.68
		CCM2	5	3.94	1.56	1.63	5.33	0.70	39.72
		CAM2	5	24.53	9.70	10.64	35.33	4.34	39.54
		AFOW	5	3284.25	906.54	2126.03	4329.45	405.42	27.60
		AI	5	142.99	33.35	116.59	199.88	14.92	23.33
		CCAM2	5	17.94	10.37	1.90	28.53	4.64	57.83
		CAI	5	356.44	426.03	144.69	1117.83	190.53	119.52

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Dec. 82	496.5	PAM2	7	14.06	5.77	7.37	25.67	2.18	41.06
		PI	7	1.45	0.08	1.33	1.52	0.03	5.53
		CBM2	7	6.86	1.58	4.60	9.13	0.60	23.03
		CCM2	7	5.30	1.19	3.59	6.36	0.45	22.37
		CAM2	7	33.78	7.03	23.23	42.34	2.66	20.80
		AFOW	7	1931.60	424.86	1428.08	2589.04	160.58	22.00
		AI	7	58.60	13.05	34.35	74.02	4.93	22.28
		CCAM2	7	24.85	6.39	14.04	34.60	2.42	25.72
		CAI	7	82.69	27.26	42.03	122.45	10.30	32.97
Dec. 82	529.5	PAM2	7	28.82	6.66	18.83	36.93	2.52	23.11
		PI	7	1.45	0.10	1.27	1.55	0.04	6.82
		CBM2	7	3.03	0.87	1.78	4.41	0.33	28.80
		CCM2	7	12.19	3.96	8.20	19.72	1.49	32.46
		CAM2	7	76.75	31.00	46.44	142.13	11.72	40.39
		AFOW	7	5776.03	695.42	4969.18	6919.18	262.84	12.04
		AI	7	83.12	26.13	42.03	114.25	9.88	31.44
		CCAM2	7	57.36	30.22	23.34	118.28	11.42	52.69
		CAI	7	123.51	59.97	50.51	225.95	22.67	48.56
Feb. 83	496.5	PAM2	7	9.17	9.60	0.00	25.51	3.63	104.69
		PI	7	1.63	0.15	1.44	1.85	0.06	9.21
		CBM2	7	0.45	1.03	0.00	2.77	0.39	229.15
		CCM2	7	12.58	3.31	9.64	19.40	1.25	26.30
		CAM2	7	56.75	15.86	35.69	87.92	5.99	27.95
		AFOW	7	5040.61	1308.54	3239.04	6881.51	494.58	25.96
		AI	7	89.56	12.22	72.63	109.79	4.62	13.65
		CCAM2	7	50.08	17.46	33.36	87.92	6.60	34.86
		CAI	7	104.20	24.39	72.63	136.96	9.22	23.41

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Feb. 83	518.0	PAM2	7	4.11	3.13	0.00	8.65	1.18	76.14
		PI	7	1.85	1.75	0.97	5.78	0.66	94.76
		CBM2	7	0.27	0.19	0.00	0.63	0.07	70.79
		CCM2	7	1.29	0.46	0.87	2.27	0.17	35.52
		CAM2	7	5.00	2.22	2.78	8.96	0.84	44.45
		AFOW	7	417.32	191.69	195.89	780.82	72.45	45.93
		AI	7	88.87	35.00	45.59	148.61	13.23	39.38
		CCAM2	6	2.92	2.61	0.07	7.05	1.06	89.17
		CAI	6	1193.83	2149.70	45.59	5486.89	877.61	180.07
Feb. 83	527.4	PAM2	7	3.40	2.16	1.16	7.41	0.82	63.62
		PI	7	1.11	0.08	1.01	1.27	0.03	7.33
		CBM2	7	0.36	0.38	0.00	1.10	0.15	106.17
		CCM2	7	0.71	0.18	0.54	1.08	0.07	25.14
		CAM2	7	2.55	1.32	1.37	5.18	0.50	51.78
		AFOW	7	245.50	87.29	163.01	413.01	32.99	35.56
		AI	7	104.36	27.49	69.53	149.04	10.39	26.34
		CCAM2	7	0.49	0.23	0.07	0.73	0.09	46.08
		CAI	7	806.05	927.15	236.89	2883.90	350.43	115.02
Feb. 83	528.0	PAM2	6	0.97	0.22	0.72	1.18	0.09	22.53
		PI	6	1.12	0.11	1.00	1.29	0.05	9.88
		CBM2	6	0.11	0.06	0.00	0.20	0.03	60.92
		CCM2	6	0.35	0.03	0.31	0.39	0.01	8.06
		CAM2	6	0.81	0.23	0.49	1.07	0.10	28.96
		AFOW	6	181.51	52.18	106.16	243.84	21.30	28.75
		AI	6	242.62	90.64	98.79	353.73	37.01	37.36
		CCAM2	6	0.22	0.21	0.00	0.51	0.08	94.28
		CAI	4	619.15	332.59	290.26	969.10	166.30	53.72

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
June 83	506.6	PAM2	7	14.90	8.82	1.85	27.60	3.33	59.18
		PI	7	1.58	0.10	1.40	1.68	0.04	6.45
		CBM2	7	8.23	5.65	0.00	17.71	2.13	68.58
		CCM2	7	13.11	13.26	0.00	30.35	5.01	101.08
		CAM2	7	99.67	41.77	39.92	159.00	15.79	41.91
		AFOW	7	8054.31	2927.18	4833.56	13348.63	1106.37	36.34
		AI	7	93.09	48.71	54.08	165.87	18.41	52.33
		CCAM2	7	87.94	41.25	27.36	149.67	15.59	46.91
		CAI	7	114.98	75.66	57.46	233.36	28.60	65.80
June 83	518.0	PAM2	2	1.29	1.82	0.00	2.57	1.29	141.42
		PI	2	1.71	0.03	1.69	1.73	0.02	1.82
		CBM2	2	2.39	3.38	0.00	4.78	2.39	141.42
		CCM2	2	22.36	0.69	21.87	22.85	0.49	3.08
		CAM2	2	151.38	4.40	148.27	154.49	3.11	2.91
		AFOW	2	13326.37	5.33	13322.60	13330.14	3.77	0.04
		AI	2	88.07	2.53	86.28	89.86	1.79	2.87
		CCAM2	2	147.76	0.72	147.25	148.27	0.51	0.49
		CAI	2	90.19	0.47	89.86	90.53	0.34	0.53
Sep. 83	506.6	PAM2	4	5.67	6.43	0.00	13.78	3.22	113.35
		PI	4	1.61	0.25	1.42	1.95	0.12	15.45
		CBM2	4	1.48	2.35	0.00	4.93	1.17	159.18
		CCM2	4	1.12	1.41	0.00	3.05	0.71	126.12
		CAM2	4	16.24	9.80	7.78	29.40	4.90	60.36
		AFOW	4	4973.12	3847.21	1821.23	10291.10	1923.60	77.36
		AI	4	287.74	72.41	184.58	349.98	36.20	25.16
		CCAM2	4	12.48	5.84	7.78	20.63	2.92	46.79
		CAI	4	360.70	125.13	207.48	498.88	62.56	34.69

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Sep. 83	529.5	PAM2	2	5.79	7.26	0.66	10.93	5.14	125.35
		PI	2	1.58	0.16	1.47	1.69	0.11	10.04
		CBM2	2	0.00	0.00	0.00	0.00	0.00	.
		CCM2	2	3.84	2.46	2.10	5.58	1.74	63.94
		CAM2	2	42.67	18.55	29.56	55.79	13.11	43.46
		AFOW	2	2620.89	1124.11	1826.03	3415.75	794.86	42.89
		AI	2	61.50	0.39	61.23	61.78	0.27	0.63
		CCAM2	2	37.53	22.03	21.95	53.11	15.58	58.72
		CAI	2	73.76	13.36	64.32	83.21	9.45	18.11
Nov. 83	496.5	PAM2	6	10.03	9.90	0.00	24.86	4.04	98.65
		PI	6	1.60	0.17	1.41	1.88	0.07	10.60
		CBM2	6	0.00	0.00	0.00	0.00	0.00	.
		CCM2	6	2.24	2.69	0.00	7.23	1.10	119.68
		CAM2	6	48.07	9.61	32.52	61.68	3.92	19.99
		AFOW	6	4617.35	832.10	3374.66	5723.29	339.70	18.02
		AI	6	96.75	8.42	82.49	105.08	3.44	8.71
		CCAM2	6	40.78	10.55	32.52	61.68	4.31	25.88
		CAI	6	115.21	16.18	92.80	140.34	6.60	14.04
Nov. 83	518.0	PAM2	7	27.05	20.07	0.00	58.34	7.59	74.22
		PI	7	1.56	0.11	1.38	1.71	0.04	7.21
		CBM2	7	0.00	0.00	0.00	0.00	0.00	.
		CCM2	7	10.48	2.50	5.93	12.94	0.95	23.89
		CAM2	7	118.24	15.96	92.97	140.40	6.03	13.50
		AFOW	7	10155.58	2213.65	7908.22	14363.01	836.68	21.80
		AI	7	85.62	11.37	73.72	102.30	4.30	13.28
		CCAM2	7	98.00	18.33	68.40	124.72	6.93	18.70
		CAI	7	104.23	14.90	86.58	123.10	5.63	14.30

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Nov. 83	527.4	PAM2	6	55.37	38.53	23.17	125.12	15.73	69.59
		PI	6	1.41	0.17	1.18	1.57	0.07	11.99
		CBM2	6	0.00	0.00	0.00	0.00	0.00	.
		CCM2	6	11.64	5.92	3.40	18.93	2.42	50.87
		CAM2	6	117.10	33.38	69.80	160.86	13.63	28.51
		AFOW	6	7200.57	3445.20	3504.11	13290.41	1406.50	47.85
		AI	6	59.22	12.05	50.09	82.62	4.92	20.35
		CCAM2	6	79.53	36.66	24.14	127.94	14.97	46.09
		CAI	6	98.29	34.18	60.67	145.16	13.95	34.77
Nov. 83	528.0	PAM2	1	68.80	.	68.80	68.80	.	.
		PI	1	1.26	.	1.26	1.26	.	.
		CBM2	1	0.00	.	0.00	0.00	.	.
		CCM2	1	4.86	.	4.86	4.86	.	.
		CAM2	1	85.11	.	85.11	85.11	.	.
		AFOW	1	4626.03	.	4626.03	4626.03	.	.
		AI	1	54.35	.	54.35	54.35	.	.
		CCAM2	1	41.04	.	41.04	41.04	.	.
		CAI	1	112.73	.	112.73	112.73	.	.
Nov. 83	529.5	PAM2	3	42.35	31.73	7.48	69.52	18.32	74.91
		PI	3	1.43	0.19	1.27	1.64	0.11	13.23
		CBM2	3	0.00	0.00	0.00	0.00	0.00	.
		CCM2	3	9.12	1.99	7.34	11.27	1.15	21.85
		CAM2	3	91.10	2.53	89.02	93.92	1.46	2.78
		AFOW	3	9483.11	3861.80	5023.97	11737.67	2229.61	40.72
		AI	3	103.96	42.00	55.60	131.29	24.25	40.40
		CCAM2	3	62.23	18.98	44.26	82.08	10.96	30.50
		CAI	3	173.27	103.09	61.21	264.09	59.52	59.50

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Mar. 84	506.6	PAM2	7	17.04	23.51	0.00	66.19	8.89	138.02
		PI	7	1.60	0.24	1.19	1.91	0.09	14.69
		CBM2	7	0.44	1.16	0.00	3.08	0.44	264.58
		CCM2	7	6.57	3.49	0.50	10.27	1.32	53.14
		CAM2	7	62.04	19.34	19.41	75.82	7.31	31.17
		AFOW	7	23108.90	52150.37	1090.41	141345.89	19710.99	225.67
		AI	7	314.98	683.18	45.39	1864.23	258.22	216.90
		CCAM2	7	50.08	20.22	19.41	69.35	7.64	40.37
		CAI	7	358.94	741.30	49.45	2038.25	280.19	206.53
Mar. 84	518.0	PAM2	7	25.90	35.14	0.00	96.43	13.28	135.66
		PI	7	1.55	0.28	1.07	1.90	0.11	18.17
		CBM2	7	0.37	0.65	0.00	1.49	0.24	172.87
		CCM2	7	5.38	6.67	0.00	19.15	2.52	123.97
		CAM2	7	50.32	33.94	13.73	105.41	12.83	67.45
		AFOW	7	2901.66	2813.61	685.62	8432.19	1063.44	96.97
		AI	7	58.98	26.92	10.43	96.25	10.17	45.64
		CCAM2	7	33.37	25.79	11.41	82.88	9.75	77.26
		CAI	7	114.11	132.39	17.35	407.36	50.04	116.02
Mar. 84	527.4	PAM2	5	2.21	2.34	0.00	5.56	1.05	106.11
		PI	5	1.66	0.22	1.40	1.94	0.10	13.01
		CBM2	5	0.00	0.00	0.00	0.00	0.00	.
		CCM2	5	1.10	0.97	0.20	2.75	0.43	88.00
		CAM2	5	16.27	8.22	10.95	30.72	3.68	50.52
		AFOW	5	800.55	403.29	585.62	1519.18	180.36	50.38
		AI	5	49.94	8.65	40.57	61.95	3.87	17.33
		CCAM2	5	14.61	9.21	7.24	30.72	4.12	63.05
		CAI	5	59.50	19.20	49.42	93.63	8.58	32.26

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Mar. 84	528.0	PAM2	6	9.52	5.96	0.00	16.95	2.43	62.56
		PI	6	1.39	0.54	1.06	2.44	0.22	39.05
		CBM2	6	0.26	0.63	0.00	1.54	0.26	244.95
		CCM2	6	0.61	0.41	0.00	1.14	0.17	67.24
		CAM2	6	14.01	9.16	6.76	31.56	3.74	65.38
		AFOW	5	745.89	529.08	332.88	1643.84	236.61	70.93
		AI	5	54.14	3.69	49.22	58.21	1.65	6.82
		CCAM2	6	7.94	10.07	1.17	25.46	4.11	126.92
		CAI	5	251.12	135.02	64.57	440.07	60.38	53.77
Mar. 84	529.5	PAM2	3	9.50	5.65	4.32	15.53	3.26	59.49
		PI	3	1.16	0.15	1.05	1.34	0.09	13.11
		CBM2	3	0.00	0.00	0.00	0.00	0.00	.
		CCM2	3	0.97	0.33	0.74	1.35	0.19	34.50
		CAM2	3	8.19	2.38	6.76	10.93	1.37	29.07
		AFOW	3	502.28	295.31	323.97	843.15	170.49	58.79
		AI	3	58.17	16.42	47.90	77.11	9.48	28.23
		CCAM2	3	2.24	1.54	1.32	4.02	0.89	68.74
		CAI	3	319.29	287.80	84.44	640.35	166.16	90.14
July 84	496.5	PAM2	7	5.37	4.39	0.35	13.20	1.66	81.74
		PI	7	1.61	0.09	1.44	1.70	0.03	5.47
		CBM2	7	1.17	1.85	0.00	4.88	0.70	158.30
		CCM2	7	0.73	1.92	0.00	5.09	0.73	262.80
		CAM2	7	56.37	36.55	23.55	118.54	13.81	64.83
		AFOW	7	6421.14	3997.63	2565.75	12295.89	1510.96	62.26
		AI	7	115.08	21.66	90.57	145.59	8.19	18.82
		CCAM2	7	51.12	36.28	21.73	114.26	13.71	70.96
		CAI	7	132.72	35.76	95.64	193.51	13.51	26.94

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
July 84	506.6	PAM2	7	4.24	6.64	0.00	15.05	2.51	156.64
		PI	7	1.70	0.32	1.27	2.30	0.12	18.52
		CBM2	7	1.96	3.25	0.00	7.52	1.23	165.26
		CCM2	7	0.90	2.38	0.00	6.29	0.90	264.58
		CAM2	7	30.24	10.86	18.73	44.52	4.10	35.91
		AFOW	7	4897.95	2542.68	93.84	8617.12	961.04	51.91
		AI	7	182.33	86.81	2.11	258.11	32.81	47.61
		CCAM2	7	27.17	12.03	9.22	44.52	4.55	44.29
		CAI	7	230.61	145.61	2.11	483.55	55.04	63.14
July 84	518.0	PAM2	7	16.92	18.99	0.00	51.02	7.18	112.24
		PI	7	1.62	0.18	1.46	1.89	0.07	11.03
		CBM2	7	9.48	7.81	0.57	18.92	2.95	82.42
		CCM2	7	13.66	2.72	10.72	17.43	1.03	19.91
		CAM2	7	74.46	29.07	47.29	129.70	10.99	39.04
		AFOW	7	33149.41	27565.74	14612.33	93367.81	10418.87	83.16
		AI	7	454.39	312.40	146.17	1124.20	118.08	68.75
		CCAM2	7	62.90	19.99	37.01	96.56	7.56	31.78
		CAI	7	533.21	375.04	196.34	1318.57	141.75	70.34
Sep. 84	496.5	PAM2	2	3.84	4.87	0.40	7.29	3.45	126.88
		PI	2	1.47	0.30	1.26	1.68	0.21	20.06
		CBM2	2	0.96	1.36	0.00	1.93	0.96	141.42
		CCM2	2	0.39	0.55	0.00	0.78	0.39	141.42
		CAM2	2	11.95	3.83	9.25	14.66	2.71	32.01
		AFOW	2	2598.63	893.09	1967.12	3230.14	631.51	34.37
		AI	2	216.54	5.40	212.72	220.35	3.82	2.49
		CCAM2	2	9.22	6.83	4.39	14.04	4.83	74.08
		CAI	2	339.09	154.29	229.99	448.19	109.10	45.50

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Sep. 84	506.6	PAM2	2	22.41	0.59	21.99	22.82	0.42	2.63
		PI	2	1.29	0.05	1.26	1.33	0.04	3.94
		CBM2	2	0.81	1.14	0.00	1.62	0.81	141.42
		CCM2	2	0.74	1.04	0.00	1.48	0.74	141.42
		CAM2	2	30.83	5.54	26.91	34.74	3.92	17.96
		AFOW	2	4100.34	1208.38	3245.89	4954.79	854.45	29.47
		AI	2	131.61	15.55	120.61	142.61	11.00	11.82
		CCAM2	2	16.46	5.28	12.73	20.19	3.73	32.06
		CAI	2	250.21	6.79	245.41	255.02	4.80	2.71
Sep. 84	518.0	PAM2	7	36.11	39.25	0.83	113.72	14.83	108.70
		PI	7	1.39	0.25	1.02	1.66	0.10	18.29
		CBM2	7	1.29	1.29	0.00	2.88	0.49	100.60
		CCM2	7	5.39	3.53	0.95	9.88	1.33	65.43
		CAM2	7	53.14	23.43	14.82	86.67	8.85	44.09
		AFOW	7	6999.90	3439.08	2739.73	13605.48	1299.85	49.13
		AI	7	157.88	85.53	31.61	316.87	32.33	54.18
		CCAM2	7	30.03	25.06	3.95	73.74	9.47	83.46
		CAI	7	757.74	1215.28	37.16	3444.31	459.33	160.38
Sep. 84	527.4	PAM2	7	18.78	22.37	0.66	65.66	8.45	119.11
		PI	7	1.40	0.18	1.18	1.67	0.07	12.70
		CBM2	7	2.07	3.47	0.00	9.76	1.31	167.27
		CCM2	7	2.04	1.96	0.00	5.44	0.74	95.79
		CAM2	7	28.50	19.05	12.65	62.97	7.20	66.83
		AFOW	7	6416.93	2521.57	3892.47	10700.68	953.06	39.30
		AI	7	280.13	122.52	83.37	472.46	46.31	43.74
		CCAM2	7	16.55	7.88	5.27	27.65	2.98	47.62
		CAI	7	441.69	193.92	230.03	837.36	73.30	43.90

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Sep. 84	528.0	PAM2	7	8.92	3.32	5.18	15.32	1.25	37.17
		PI	7	1.19	0.11	1.04	1.38	0.04	9.24
		CBM2	7	0.58	0.79	0.00	2.11	0.30	135.10
		CCM2	7	1.17	0.79	0.00	2.36	0.30	67.50
		CAM2	7	9.30	4.31	5.41	17.89	1.63	46.39
		AFOW	7	5415.95	1431.31	2716.44	6912.33	540.98	26.43
		AI	7	687.80	342.37	237.24	1264.47	129.40	49.78
		CCAM2	7	3.76	2.99	0.44	8.34	1.13	79.37
		CAI	7	3168.56	3473.14	364.07	10557.12	1312.72	109.61
Dec. 84	496.5	PAM2	2	40.97	33.80	17.07	64.87	23.90	82.49
		PI	2	1.36	0.16	1.24	1.47	0.11	11.65
		CBM2	2	0.26	0.37	0.00	0.53	0.26	141.42
		CCM2	2	9.08	2.59	7.25	10.91	1.83	28.49
		CAM2	2	60.74	21.09	45.83	75.65	14.91	34.72
		AFOW	2	4456.16	1407.43	3460.96	5451.37	995.21	31.58
		AI	2	73.79	2.45	72.06	75.52	1.73	3.32
		CCAM2	2	34.45	0.31	34.23	34.67	0.22	0.90
		CAI	2	129.16	39.69	101.10	157.22	28.06	30.73
Dec. 84	506.6	PAM2	2	50.69	0.12	50.61	50.78	0.09	0.24
		PI	2	1.33	0.01	1.33	1.34	0.01	0.56
		CBM2	2	0.00	0.00	0.00	0.00	0.00	.
		CCM2	2	10.46	0.80	9.89	11.02	0.57	7.65
		CAM2	2	78.76	1.85	77.45	80.07	1.31	2.35
		AFOW	2	5396.92	270.73	5205.48	5588.36	191.44	5.02
		AI	2	68.58	5.05	65.01	72.16	3.57	7.36
		CCAM2	2	46.08	1.86	44.77	47.40	1.32	4.04
		CAI	2	117.32	10.62	109.82	124.83	7.51	9.05

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Dec. 84	527.4	PAM2	7	48.19	19.89	18.51	70.01	7.52	41.28
		PI	7	1.49	0.07	1.39	1.58	0.03	4.78
		CBM2	7	22.63	3.82	17.00	27.84	1.45	16.89
		CCM2	7	11.34	4.51	7.11	17.12	1.70	39.78
		CAM2	7	139.53	19.74	101.76	166.58	7.46	14.14
		AFOW	7	11604.21	4748.17	7846.58	20555.48	1794.64	40.92
		AI	7	83.73	34.22	54.19	152.30	12.93	40.87
		CCAM2	7	107.91	16.41	88.51	128.75	6.20	15.21
		CAI	7	110.95	55.29	63.84	227.07	20.90	49.83
Dec. 84	528.0	PAM2	5	86.60	43.51	46.27	158.52	19.46	50.24
		PI	5	1.29	0.07	1.21	1.40	0.03	5.45
		CBM2	5	22.24	14.57	8.75	46.44	6.52	65.53
		CCM2	5	9.35	3.31	5.45	14.56	1.48	35.45
		CAM2	5	118.85	63.41	59.82	204.76	28.36	53.36
		AFOW	5	19006.85	2130.93	16071.23	21369.18	952.98	11.21
		AI	5	206.96	115.89	85.93	357.24	51.83	56.00
		CCAM2	5	65.34	41.39	31.18	113.46	18.51	63.35
		CAI	5	413.22	245.82	141.65	685.34	109.94	59.49
Dec. 84	529.5	PAM2	7	86.26	23.36	41.26	106.11	8.83	27.08
		PI	7	1.38	0.03	1.33	1.41	0.01	2.03
		CBM2	7	23.61	10.19	10.45	40.77	3.85	43.17
		CCM2	7	12.01	3.83	5.32	15.35	1.45	31.90
		CAM2	7	156.95	43.90	73.97	199.98	16.59	27.97
		AFOW	7	13591.00	4319.02	6293.15	17769.18	1632.43	31.78

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	7	86.75	14.13	67.19	107.74	5.34	16.29
		CCAM2	7	102.39	31.06	47.84	138.80	11.74	30.34
		CAI	7	134.69	29.00	98.80	183.21	10.96	21.53
Feb. 85	496.5	PAM2	1	0.00	.	0.00	0.00	.	.
		PI	1	1.77	.	1.77	1.77	.	.
		CBM2	1	0.00	.	0.00	0.00	.	.
		CCM2	1	0.00	.	0.00	0.00	.	.
		CAM2	1	22.22	.	22.22	22.22	.	.
		AFOW	1	1878.08	.	1878.08	1878.08	.	.
		AI	1	84.52	.	84.52	84.52	.	.
		CCAM2	1	22.22	.	22.22	22.22	.	.
		CAI	1	84.52	.	84.52	84.52	.	.
Feb. 85	506.6	PAM2	2	11.11	10.93	3.38	18.84	7.73	98.39
		PI	2	1.10	0.09	1.03	1.16	0.07	8.48
		CBM2	2	0.00	0.00	0.00	0.00	0.00	.
		CCM2	2	0.49	0.41	0.20	0.78	0.29	84.32
		CAM2	2	7.85	6.62	3.17	12.53	4.68	84.29
		AFOW	2	733.22	427.65	430.82	1035.62	302.40	58.33
		AI	2	180.46	206.58	34.39	326.53	146.07	114.47
		CCAM2	2	0.95	0.10	0.88	1.02	0.07	10.88
		CAI	2	751.01	368.01	490.79	1011.24	260.22	49.00
Feb. 85	528.0	PAM2	7	5.83	5.12	1.03	15.97	1.94	87.86
		PI	7	1.22	0.18	1.06	1.55	0.07	14.53
		CBM2	7	0.00	0.00	0.00	0.00	0.00	.
		CCM2	7	0.35	0.43	0.00	1.22	0.16	121.28
		CAM2	7	5.33	2.91	2.20	11.27	1.10	54.56
		AFOW	6	459.59	224.13	215.75	828.77	91.50	48.77

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	6	92.65	31.60	61.30	141.59	12.90	34.10
		CCAM2	7	1.65	0.93	1.02	3.73	0.35	56.21
		CAI	6	329.91	205.42	85.55	596.29	83.86	62.27
Feb. 85	529.5	PAM2	2	2.51	2.33	0.86	4.15	1.65	93.11
		PI	2	1.22	0.28	1.02	1.41	0.20	22.67
		CBM2	2	0.00	0.00	0.00	0.00	0.00	141.42
		CCM2	2	0.43	0.04	0.40	0.46	0.03	8.47
		CAM2	2	2.25	0.62	1.81	2.69	0.44	27.76
		AFOW	2	186.64	27.61	167.12	206.16	19.52	14.79
		AI	2	88.08	36.72	62.11	114.04	25.97	41.70
		CCAM2	2	0.69	0.78	0.15	1.24	0.55	111.65
		CAI	2	654.05	690.52	165.79	1142.32	488.27	105.57
May 85	496.5	PAM2	2	11.75	14.57	1.45	22.05	10.30	123.99
		PI	2	1.51	0.21	1.37	1.66	0.15	13.71
		CBM2	2	0.00	0.00	0.00	0.00	0.00	.
		CCM2	2	0.00	0.00	0.00	0.00	0.00	.
		CAM2	2	32.15	9.34	25.55	38.75	6.60	29.05
		AFOW	2	6984.93	1796.83	5714.38	8255.48	1270.55	25.72
		AI	2	218.35	7.54	213.02	223.68	5.33	3.45
		CCAM2	2	23.74	0.57	23.34	24.14	0.40	2.40
		CAI	2	293.44	68.66	244.88	341.99	48.55	23.40
May 85	506.6	PAM2	7	10.56	14.02	0.00	31.62	5.30	132.71
		PI	7	1.59	0.16	1.40	1.80	0.06	9.86
		CBM2	7	0.16	0.41	0.00	1.10	0.16	264.58
		CCM2	7	0.91	1.46	0.00	3.97	0.55	161.38
		CAM2	7	43.78	16.75	18.86	61.80	6.33	38.26
		AFOW	7	5501.37	1494.80	3489.73	6930.14	564.98	27.17

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	7	132.93	25.63	109.27	184.99	9.69	19.28
		CCAM2	7	35.96	12.00	14.48	49.08	4.54	33.37
		CAI	7	160.96	38.66	127.51	240.94	14.61	24.02
May 85	518.0	PAM2	7	44.08	16.57	28.08	79.18	6.26	37.59
		PI	7	1.38	0.11	1.20	1.47	0.04	8.24
		CBM2	7	16.59	5.19	9.62	25.84	1.96	31.27
		CCM2	7	3.83	2.79	0.00	8.00	1.05	72.74
		CAM2	7	82.97	23.83	42.93	113.57	9.01	28.73
		AFOW	7	26352.15	4487.86	19228.77	32579.45	1696.25	17.03
		AI	7	357.68	168.73	178.06	682.03	63.77	47.17
		CCAM2	7	55.29	23.35	16.90	83.68	8.83	42.23
		CAI	7	640.63	506.02	234.28	1732.74	191.26	78.99
May 85	527.4	PAM2	7	16.59	12.90	0.48	39.76	4.88	77.77
		PI	7	1.41	0.24	0.93	1.68	0.09	17.20
		CBM2	7	2.46	0.99	1.13	3.69	0.37	40.11
		CCM2	7	6.15	2.34	4.01	10.69	0.88	38.02
		CAM2	7	30.82	13.19	16.52	54.65	4.98	42.79
		AFOW	7	9443.44	3598.97	3010.27	13446.58	1360.28	38.11
		AI	7	363.37	237.66	96.99	814.07	89.83	65.40
		CCAM2	6	24.14	10.24	15.80	42.57	4.18	42.41
		CAI	6	414.54	232.17	180.49	851.02	94.78	56.01
May 85	528.0	PAM2	7	30.48	19.00	4.70	60.79	7.18	62.33
		PI	7	1.30	0.19	1.06	1.59	0.07	14.84
		CBM2	7	5.86	3.84	0.65	11.90	1.45	65.56
		CCM2	7	11.79	3.72	4.09	15.19	1.41	31.58
		CAM2	7	38.45	9.35	25.09	51.80	3.53	24.31
		AFOW	7	19110.57	1588.22	16582.19	21543.84	600.29	8.31

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	7	525.96	158.79	374.93	858.52	60.02	30.19
		CCAM2	7	19.69	9.78	3.51	28.09	3.70	49.69
		CAI	7	1736.55	2023.30	629.68	6135.69	764.73	116.51
May 85	529.5	PAM2	2	16.00	6.80	11.19	20.80	4.81	42.48
		PI	2	1.46	0.07	1.41	1.51	0.05	5.03
		CBM2	2	0.90	0.69	0.41	1.38	0.49	76.81
		CCM2	2	5.56	1.59	4.44	6.68	1.12	28.52
		CAM2	2	40.38	3.25	38.08	42.68	2.30	8.06
		AFOW	2	6198.29	2178.95	4657.53	7739.04	1540.75	35.15
		AI	2	156.19	66.55	109.13	203.24	47.06	42.61
		CCAM2	2	29.63	0.93	28.97	30.28	0.66	3.14
		CAI	2	208.16	67.01	160.78	255.55	47.38	32.19
Aug. 85	496.5	PAM2	2	5.73	4.81	2.33	9.13	3.40	83.99
		PI	2	1.49	0.10	1.42	1.56	0.07	6.88
		CBM2	2	3.60	1.86	2.28	4.92	1.32	51.76
		CCM2	2	0.33	0.34	0.08	0.57	0.24	104.55
		CAM2	2	15.28	5.70	11.26	19.31	4.03	37.26
		AFOW	2	4186.64	3156.31	1954.79	6418.49	2231.85	75.39
		AI	2	335.68	331.57	101.22	570.14	234.46	98.78
		CCAM2	2	11.63	2.79	9.66	13.61	1.98	24.01
		CAI	2	404.20	368.44	143.67	664.72	260.53	91.15
Aug. 85	506.6	PAM2	6	0.89	1.08	0.00	2.73	0.44	121.34
		PI	6	1.47	0.36	1.16	2.08	0.15	24.27
		CBM2	6	0.28	0.25	0.00	0.69	0.10	89.49
		CCM2	6	0.12	0.07	0.00	0.19	0.03	57.80
		CAM2	6	2.01	1.61	0.65	5.08	0.66	80.29
		AFOW	5	6575.89	2370.25	3505.48	9568.49	1060.01	36.04

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	5	4979.19	3905.15	1595.16	9983.05	1746.44	78.43
		CCAM2	6	1.47	1.79	0.37	5.08	0.73	121.90
		CAI	5	8088.43	6684.29	1595.16	17651.69	2989.30	82.64
Aug. 85	518.0	PAM2	7	3.29	3.17	0.00	8.43	1.20	96.53
		PI	7	1.56	0.18	1.21	1.74	0.07	11.51
		CBM2	7	3.15	3.81	0.52	11.32	1.44	120.93
		CCM2	7	1.25	0.68	0.50	2.06	0.26	54.61
		CAM2	7	19.04	19.62	5.39	60.06	7.41	103.01
		AFOW	7	6304.89	3195.83	1730.82	10539.73	1207.91	50.69
		AI	7	632.41	552.79	85.13	1517.42	208.94	87.41
		CCAM2	7	16.69	18.89	2.85	56.62	7.14	113.22
		CAI	7	901.47	957.53	115.99	2596.75	361.91	106.22
Aug. 85	527.4	PAM2	7	15.94	16.85	0.00	40.55	6.37	105.70
		PI	7	1.53	0.20	1.25	1.82	0.08	13.01
		CBM2	7	3.75	1.86	0.64	6.42	0.70	49.50
		CCM2	7	4.81	2.67	1.27	8.15	1.01	55.46
		CAM2	7	52.35	26.16	28.07	95.01	9.89	49.96
		AFOW	7	1658.22	3392.91	207.53	9330.14	1282.40	204.61
		AI	7	23.10	34.36	3.01	98.20	12.99	148.74
		CCAM2	7	41.94	26.55	18.00	95.01	10.03	63.30
		CAI	7	25.26	33.31	4.61	98.20	12.59	131.86
Aug. 85	528.0	PAM2	7	30.07	32.56	0.00	90.98	12.30	108.26
		PI	7	1.44	0.18	1.18	1.72	0.07	12.72
		CBM2	7	3.92	3.63	0.75	9.81	1.37	92.43
		CCM2	7	5.33	3.13	1.95	10.66	1.18	58.77
		CAM2	7	49.34	23.30	20.93	88.15	8.81	47.23
		AFOW	7	2608.51	2400.62	292.47	5880.82	907.35	92.03
		AI	7	53.23	46.92	4.10	127.86	17.73	88.15
		CCAM2	7	30.34	5.95	18.00	36.87	2.25	19.60
		CAI	7	83.43	71.94	7.93	171.78	27.19	86.23

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Nov. 85	496.5	PAM2	7	7.12	6.23	0.00	13.80	2.35	87.51
		PI	7	1.38	0.31	1.05	1.77	0.12	22.68
		CBM2	7	2.42	1.72	0.54	5.86	0.65	70.83
		CCM2	7	0.30	0.38	0.00	0.81	0.14	127.13
		CAM2	7	13.13	4.37	8.05	20.18	1.65	33.32
		AFOW	7	1216.83	413.81	854.11	1968.49	156.41	34.01
		AI	7	94.39	16.18	63.93	114.29	6.12	17.14
		CCAM2	7	8.70	7.17	0.88	19.31	2.71	82.42
		CAI	7	402.77	448.04	63.93	1116.39	169.34	111.24
Nov. 85	506.6	PAM2	7	6.79	6.96	0.00	14.24	2.63	102.39
		PI	7	1.57	0.20	1.31	1.89	0.08	12.77
		CBM2	7	3.39	2.07	0.76	5.92	0.78	61.13
		CCM2	7	0.32	0.85	0.00	2.25	0.32	264.58
		CAM2	7	22.27	14.14	6.70	50.77	5.34	63.47
		AFOW	7	1604.89	948.09	712.33	3422.60	358.34	59.08
		AI	7	75.65	15.91	56.87	106.26	6.01	21.03
		CCAM2	7	17.74	11.67	6.70	41.04	4.41	65.80
		CAI	7	93.67	14.58	77.66	116.80	5.51	15.57
Nov. 85	518.0	PAM2	2	20.96	22.82	4.83	37.09	16.13	108.85
		PI	2	1.57	0.15	1.46	1.67	0.11	9.49
		CBM2	2	10.14	12.45	1.33	18.94	8.80	122.82
		CCM2	2	8.19	0.30	7.98	8.41	0.21	3.68
		CAM2	2	107.95	15.82	96.77	119.14	11.18	14.65
		AFOW	2	5742.12	1034.99	5010.27	6473.97	731.85	18.02
		AI	2	53.06	1.81	51.78	54.34	1.28	3.42
		CCAM2	2	92.54	29.59	71.61	113.46	20.92	31.97
		CAI	2	63.51	9.12	57.06	69.96	6.45	14.36

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
Nov. 85	527.4	PAM2	7	16.46	17.21	0.00	41.76	6.51	104.55
		PI	7	1.57	0.17	1.37	1.84	0.07	11.09
		CBM2	7	7.36	2.67	3.99	10.65	1.01	36.26
		CCM2	7	2.14	1.76	0.00	4.53	0.66	81.95
		CAM2	7	67.57	13.91	40.14	85.79	5.26	20.59
		AFOW	7	494173.68	1294703.4	2821.92	3430282.9	489351.90	261.99
		AI	7	6842.42	17914.98	63.09	47469.77	6771.23	261.82
		CCAM2	7	56.54	14.40	28.16	70.13	5.44	25.47
		CAI	7	8063.28	21097.84	63.09	55908.65	7974.23	261.65
Nov. 85	528.0	PAM2	7	24.58	25.88	11.10	82.48	9.78	105.32
		PI	7	1.45	0.22	1.04	1.63	0.08	14.80
		CBM2	7	10.15	5.23	3.44	16.93	1.98	51.48
		CCM2	7	3.93	4.34	0.00	13.15	1.64	110.53
		CAM2	7	69.17	30.64	27.98	108.09	11.58	44.30
		AFOW	7	5624.17	3189.45	1473.97	10945.21	1205.50	56.71
		AI	7	84.57	52.00	52.67	200.16	19.65	61.48
		CCAM2	7	52.99	37.62	4.83	98.17	14.22	70.99
		CAI	7	394.91	825.71	58.18	2267.05	312.09	209.09
Nov. 85	529.5	PAM2	2	57.36	6.93	52.46	62.26	4.90	12.08
		PI	2	1.46	0.02	1.45	1.48	0.02	1.51
		CBM2	2	30.72	14.00	20.82	40.62	9.90	45.58
		CCM2	2	3.14	3.94	0.35	5.93	2.79	125.54
		CAM2	2	149.10	33.31	125.55	172.65	23.55	22.34
		AFOW	2	11929.45	298.34	11718.49	12140.41	210.96	2.50

Appendix 6-D (Continued)

Quarter	River Mile		N	Mean	Standard Deviation	Minimum Value	Maximum Value	Std. Error Of Mean	C.V.[1]
		AI	2	81.83	16.28	70.32	93.34	11.51	19.89
		CCAM2	2	112.25	29.02	91.73	132.77	20.52	25.85
		CAI	2	109.59	25.67	91.44	127.75	18.15	23.43

[1]Coefficient of variation
[2]Pheophytin a, mg/m^2
[3]Pheophytin index
[4]Chlorophyll b, mg/m^2
[5]Chlorophyll c, mg/m^2
[6]Chlorophyll a, mg/m^2
[7]Ash-free organic weight, mg/m^2
[8]Autotrophic index
[9]Corrected chlorophyll a, mg/m^2
[10]Corrected autotrophic index

APPENDIX 7-A

AVERAGE ABUNDANCE OF BENTHIC MACROINVERTEBRATES
COLLECTED FROM ARTIFICIAL SUBSTRATES FOLLOWING ONE-MONTH
COLONIZATION PERIODS NEAR WATTS BAR NUCLEAR PLANT,
SPRING 1975 THROUGH AUTUMN 1985
(UNBAGGED COLLECTION)

Appendix 7-A. Average Abundance of Benthic Macroinvertebrates Collected from Artificial Substrates Following One-Month Colonization Periods Near Watts Bar Nuclear Plant, Spring 1975 through Autumn 1985 (Unbagged Collection).

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1975						JUN 1975					
BRYOZOA	1	1	1	0	1	-*	0	-	0	0	0	-
CAMPELOMA SP.	0	0	0	0	13	-	0	-	0	0	0	-
CHEUMATOPSYCHE SP.	0	6	1	0	0	-	2	-	2	8	0	-
CHIRONOMUS SP.	0	0	0	0	0	-	0	-	0	0	0	-
CURA FOREMANII	0	0	0	0	0	-	0	-	0	0	0	-
CYRNELLUS FRATERNUS	0	3	0	4	0	-	0	-	1	0	0	-
HEXAGENIA BILINEATA	1	0	0	0	0	-	0	-	0	0	0	-
HIRUDINEA	0	0	0	0	0	-	0	-	0	0	0	-
OLIGOCHAETA	6	0	0	0	0	-	0	-	0	0	0	-
ORCONECTES SP.	0	0	0	0	0	-	0	-	0	0	0	-
ORTHOCLADIUS SP.	3	2	3	0	1	-	0	-	0	0	0	-
PARACHIRONOMUS SP.	0	0	0	0	0	-	5	-	17	25	14	-
STENACRON SP.	0	0	0	0	0	-	0	-	1	0	0	-
	SEP 1975						NOV 1975					
BRYOZOA	-	0	0	0	0	-	0	-	0	0	-	-
CAMPELOMA SP.	-	0	0	0	0	-	1	-	0	0	-	-
CHEUMATOPSYCHE SP.	-	1	0	0	0	-	1	-	2	0	-	-
CHIRONOMUS SP.	-	1	1	1	1	-	2	-	5	6	-	-
CURA FOREMANII	-	0	0	0	0	-	0	-	1	0	-	-
CYRNELLUS FRATERNUS	-	7	7	29	6	-	1	-	1	0	-	-
HEXAGENIA BILINEATA	-	0	0	0	0	-	0	-	0	0	-	-
HIRUDINEA	-	0	0	0	0	-	0	-	1	0	-	-
OLIGOCHAETA	-	0	0	0	0	-	14	-	19	0	-	-
ORCONECTES SP.	-	0	1	1	1	-	0	-	0	0	-	-
ORTHOCLADIUS SP.	-	0	0	0	0	-	0	-	0	0	-	-
PARACHIRONOMUS SP.	-	0	0	0	0	-	0	-	0	0	-	-
STENACRON SP.	-	1	1	1	1	-	1	-	2	0	-	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.9	496.5	506.6	518.0	527.4	528.0	529.9
	JUN 1976						SEP 1976					
ABLABESMYIA SP.	0	0	0	0	0	-	1	0	0	0	0	-
CAENIS SP.	0	0	0	0	0	-	0	0	1	0	0	-
CAMBARUS SP.	0	0	0	0	1	-	0	0	0	0	0	-
CHEUMATOPSYCHE SP.	0	0	2	2	1	-	0	0	0	0	0	-
CHIRONOMUS (CHIRONOMUS) TENTANS	0	0	0	0	0	-	0	0	0	0	0	-
CHIRONOMUS SP.	0	0	0	1	1	-	0	0	0	0	0	-
CORBICULA MANILENSIS	0	0	0	0	0	-	1	0	1	0	0	-
CRANGONYX SP.	0	0	0	3	1	-	0	0	0	0	0	-
CRICOTOPUS SP.	0	0	0	0	0	-	0	0	0	0	0	-
CRYPTOCHIRONOMUS SP.	0	0	0	0	0	-	0	0	0	0	0	-
CURA FOREMANII	0	0	0	1	0	-	0	0	1	0	0	-
CYRNELLUS FRATERNUS	0	0	0	1	0	-	10	18	30	15	31	-
DICROTENDIPES SP.	0	0	0	0	0	-	0	0	1	1	2	-
ENALLAGMA SP.	0	0	0	0	0	-	0	1	0	0	0	-
GOMPHUS SP.	0	0	0	0	0	-	1	0	0	0	0	-
HEXAGENIA BILINEATA	0	0	0	0	0	-	1	0	0	0	0	-
HYALELLA AZTECA	0	0	0	0	0	-	1	0	0	0	0	-
HYDRA AMERICANA	14	4	52	2	0	-	0	0	0	0	0	-
HYDROPSYCHE SP.	0	0	0	0	0	-	0	0	1	0	1	-
LEPTODEA SP.	0	0	0	0	0	-	1	1	0	0	0	-
OLIGOCHAETA	0	0	0	0	0	-	1	0	0	0	0	-
ORCONECTES SP.	0	0	0	0	0	-	0	0	1	0	0	-
PARACHIRONOMUS SP.	1	1	3	6	4	-	1	0	1	3	27	-
PHYSA SP.	0	0	0	0	0	-	1	1	0	0	0	-
SIDA CRYSTALLINA	0	1	28	12	5	-	0	0	0	0	0	-
STENACRON SP.	0	0	3	0	1	-	0	0	5	0	1	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.9
			NOV 1976			
ABLABESMYIA SP.	-	0	0	0	-	-
CAENIS SP.	-	0	0	0	-	-
CAMBARUS SP.	-	0	0	0	-	-
CHEUMATOPSYCHE SP.	-	0	0	0	-	-
CHIRONOMUS (CHIRONOMUS) TENTANS	-	0	1	0	-	-
CHIRONOMUS SP.	-	0	0	0	-	-
CORBICULA MANILENSIS	-	0	0	0	-	-
CRANGONYX SP.	-	0	0	0	-	-
CRICOTOPUS SP.	-	2	0	0	-	-
CRYPTOCHIRONOMUS SP.	-	0	1	0	-	-
CURA FOREMANII	-	1	1	0	-	-
CYRNELLUS FRATERNUS	-	1	2	0	-	-
DICROTENDIPES SP.	-	0	0	0	-	-
ENALLAGMA SP.	-	0	0	0	-	-
GOMPHUS SP.	-	0	0	0	-	-
HEXAGENIA BILINEATA	-	0	0	0	-	-
HYALELLA AZTECA	-	0	0	0	-	-
HYDRA AMERICANA	-	0	0	0	-	-
HYDROPSYCHE SP.	-	3	1	0	-	-
LEPTODEA SP.	-	0	0	0	-	-
OLIGOCHAETA	-	0	0	0	-	-
ORCONECTES SP.	-	0	0	0	-	-
PARACHIRONOMUS SP.	-	0	0	0	-	-
PHYSA SP.	-	0	0	0	-	-
SIDA CRYSTALLINA	-	0	0	0	-	-
STENACRON SP.	-	1	1	1	-	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	FEB 1977						MAY 1977					
ABLABESMYIA SP.	-	0	0	0	0	0	-	0	0	1	-	-
ARGIA SP.	-	0	0	0	0	0	-	0	1	0	-	-
CAENIS SP.	-	0	0	0	0	0	-	0	0	1	-	-
CAMPELOMA SP.	-	0	0	0	0	0	-	0	0	0	-	-
CHEUMATOPSYCHE SP.	-	0	0	0	0	0	-	1	4	2	-	-
CHIRONOMIDAE	-	0	0	0	0	0	-	0	0	0	-	-
CHIRONOMUS SP.	-	0	2	0	0	0	-	2	1	17	-	-
COELOTANYPUS SP.	-	0	0	0	0	0	-	0	0	0	-	-
CORBICULA MANILENSIS	-	0	0	0	0	0	-	9	1	11	-	-
CRANGONYX SP.	-	0	0	0	0	0	-	0	0	0	-	-
CRICOTOPUS SP.	-	0	0	0	0	0	-	0	0	1	-	-
CURA FOREMANII	-	0	0	0	0	0	-	2	2	3	-	-
CURA SP.	-	0	0	0	0	0	-	0	0	0	-	-
CYRNELLUS FRATERNUS	-	0	0	0	0	0	-	0	0	0	-	-
DICROTENDIPES SP.	-	0	0	0	0	0	-	0	1	2	-	-
DUGESIA SP.	-	0	0	0	0	0	-	0	0	0	-	-
ENALLAGMA SP.	-	0	0	0	0	0	-	0	0	0	-	-
EPOICOCLADIUS SP.	-	0	0	0	0	0	-	0	0	1	-	-
GNATHOBDELLIDA	-	0	0	0	0	0	-	0	0	0	-	-
HEXAGENIA BILINEATA	-	0	0	0	0	0	-	0	0	0	-	-
HIRUDINEA	-	0	0	0	0	0	-	0	0	0	-	-
HYALELLA AZTECA	-	0	0	0	0	0	-	0	0	1	-	-
LIBELLULIDAE	-	0	0	0	0	0	-	0	0	0	-	-
NEMATA	-	0	0	0	0	0	-	0	0	0	-	-
NEURECLIPSIS SP.	-	0	0	0	0	0	-	0	1	0	-	-
OLIGOCHAETA	-	0	0	0	0	0	-	0	0	1	-	-
ORCONECTES SP.	-	0	1	0	0	1	-	0	1	0	-	-
PARACHIRONOMUS SP.	-	0	0	0	0	0	-	7	1	8	-	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	FEB 1977						MAY 1977					
PHYSA SP.	-	0	0	0	0	0	-	0	0	1	-	-
PLEUROCERA (SYN. OXYTREMA) SP.	-	0	0	0	0	0	-	0	0	1	-	-
POLYCENTROPUS SP.	-	0	0	0	0	0	-	0	1	1	-	-
PROCLADIUS SP.	-	0	0	0	0	0	-	0	0	1	-	-
RHEOTANYTARSUS SP.	-	0	0	0	0	0	-	0	0	0	-	-
SIDA CRYSTALLINA	-	0	0	0	0	0	-	47	36	16	-	-
STENACRON SP.	-	0	0	0	0	0	-	2	5	1	-	-
XENOCHIRONOMUS SP.	-	0	0	0	0	0	-	0	0	0	-	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1977						DEC 1977					
ABLABESMYIA SP.	0	1	0	0	1	-	0	0	0	0	0	-
ARGIA SP.	0	0	0	0	1	-	0	0	0	0	0	-
CAENIS SP.	0	2	0	0	1	-	0	0	0	0	0	-
CAMPELOMA SP.	1	0	0	0	0	-	0	0	0	0	0	-
CHEUMATOPSYCHE SP.	1	0	2	0	0	-	0	0	0	0	0	-
CHIRONOMIDAE	0	0	0	1	0	-	0	0	0	0	0	-
CHIRONOMUS SP.	2	0	5	5	0	-	1	1	0	0	0	-
COELOTANYPUS SP.	0	0	0	0	0	-	2	2	0	0	0	-
CORBICULA MANILENSIS	0	0	0	0	2	-	1	1	0	0	0	-
CRANGONYX SP.	0	0	0	0	0	-	1	2	0	0	0	-
CRICOTOPUS SP.	0	0	0	0	2	-	0	1	1	0	0	-
CURA FOREMANII	0	1	0	0	1	-	0	0	0	0	0	-
CURA SP.	0	0	1	0	0	-	0	0	0	0	0	-
CYRNELLUS FRATERNUS	1	2	1	0	14	-	0	0	0	0	1	-
DICROTENDIPES SP.	0	13	0	0	15	-	1	1	0	0	0	-
DUGESIA SP.	0	0	0	0	0	-	1	4	0	0	0	-
ENALLAGMA SP.	0	0	0	0	0	-	2	1	0	0	0	-
EPOICOCLADIUS SP.	0	0	0	0	0	-	0	0	0	0	0	-
GNATHOBDELLIDA	0	0	1	0	0	-	0	0	0	0	0	-
HEXAGENIA BILINEATA	0	0	0	0	0	-	3	0	0	0	0	-
HIRUDINEA	0	0	0	0	0	-	1	0	0	0	0	-
HYALELLA AZTECA	0	0	0	0	0	-	0	0	0	0	0	-
LIBELLULIDAE	0	0	0	0	0	-	0	1	0	0	0	-
NEMATA	0	1	0	0	0	-	0	0	0	0	0	-
NEURECLIPSIS SP.	0	0	0	0	0	-	0	0	0	0	0	-
OLIGOCHAETA	14	1	19	0	1	-	2	2	0	4	0	-
ORCONECTES SP.	0	0	0	0	1	-	0	1	0	0	1	-
PARACHIRONOMUS SP.	0	0	0	0	1	-	0	0	0	0	0	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1977						DEC 1977					
PHYSA SP.	0	0	0	0	1	-	1	2	0	0	0	-
PLEUROCERA (SYN. OXYTREMA) SP.	0	0	0	0	1	-	0	0	0	0	1	-
POLYCENTROPUS SP.	0	0	0	0	0	-	0	0	0	0	0	-
PROCLADIUS SP.	0	0	0	0	0	-	0	0	0	0	0	-
RHEOTANYTARSUS SP.	0	0	0	0	1	-	0	0	0	0	0	-
SIDA CRYSTALLINA	0	0	0	0	0	-	0	0	0	1	0	-
STENACRON SP.	1	0	2	0	1	-	0	0	1	0	0	-
XENOCHIRONOMUS SP.	0	0	0	0	0	-	1	0	0	0	0	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JUN 1982						AUG 1982					
ABLABESMYIA SP.	-	1	0	-	0	0	0	0	0	0	0	0
ARGIA SP.	-	1	0	-	0	0	0	0	0	0	0	0
CAENIS SP.	-	0	0	-	0	0	0	0	0	0	0	0
CAMBARUS SP..	-	0	0	-	0	0	0	0	0	0	0	1
CAMPELOMA SP.	-	1	0	-	0	0	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	-	0	0	-	0	0	0	0	0	0	1	0
CHIRONOMIDAE	-	1	1	-	3	36	1	0	0	1	0	0
CHIRONOMUS SP.	-	1	0	-	0	0	1	0	0	0	0	0
COELOTANYPUS SP.	-	3	0	-	0	0	2	1	0	0	0	0
CORBICULA MANILENSIS	-	0	1	-	1	0	0	1	0	0	0	0
CYRNELLUS FRATERNUS	-	1	7	-	21	5	1	4	5	46	34	43
ENALLAGMA SP.	-	0	0	-	0	0	0	0	0	0	0	0
EPITHECA SP.	-	1	0	-	0	0	0	0	0	0	0	0
CRANGONYX SP.	-	0	1	-	2	0	0	0	0	0	0	0
GLOSSIPHONIIDAE	-	1	0	-	0	0	0	0	0	0	0	0
GLYPTOTENDIPES SP.	-	0	1	-	2	12	0	0	0	0	0	1
GYRAULUS SP.	-	1	0	-	0	0	0	0	0	0	0	0
HEXAGENIA BILINEATA	-	1	0	-	0	0	3	0	0	0	0	0
HYALELLA AZTECA	-	10	2	-	1	0	2	0	0	0	0	0
NAIDIDAE	-	0	1	-	0	0	0	0	0	0	0	0
OECETIS SP.	-	1	0	-	0	0	0	0	0	0	0	0
OLIGOCHAETA	-	2	0	-	0	0	1	0	0	0	0	0
ORCONECTES SP.	-	1	0	-	1	0	0	1	0	1	1	1
PARACHIRONOMUS SP.	-	1	1	-	1	34	0	1	2	0	0	1
PARATENDIPES SP.	-	6	0	-	0	0	0	0	0	0	0	0
PLANARIIDAE	-	1	0	-	6	3	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	-	1	0	-	1	0	0	1	0	0	0	0
PROCLADIUS SP.	-	0	0	-	0	0	0	0	0	0	0	0
PSEUDOCHIRONOMUS	-	0	0	-	0	0	0	1	0	0	0	0
SIALIS SP.	-	0	0	-	0	0	1	0	0	0	0	0
STENACRON SP.	-	1	3	-	0	0	0	4	3	7	5	4

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.5
			DEC 1982			
ABLABESMYIA SP.	0	-	-	-	0	0
ARGIA SP.	0	-	-	-	0	0
CAENIS SP.	1	-	-	-	0	0
CAMBARUS SP..	0	-	-	-	0	0
CAMPELOMA SP.	0	-	-	-	0	0
CHEUMATOPSYCHE SP.	0	-	-	-	0	0
CHIRONOMIDAE	0	-	-	-	0	1
CHIRONOMUS SP.	0	-	-	-	0	0
COELOTANYPUS SP.	0	-	-	-	0	0
CORBICULA MANILENSIS	0	-	-	-	0	0
CYRNELLUS FRATERNUS	0	-	-	-	0	1
ENALLAGMA SP.	1	-	-	-	0	0
EPITHECA SP.	0	-	-	-	0	0
CRANGONYX SP.	0	-	-	-	0	0
GLOSSIPHONIIDAE	0	-	-	-	0	0
GLYPTOTENDIPES SP.	0	-	-	-	0	0
GYRAULUS SP.	1	-	-	-	0	0
HEXAGENIA BILINEATA	0	-	-	-	0	0
HYALELLA AZTECA	1	-	-	-	0	0
NAIDIDAE	0	-	-	-	0	0
OECETIS SP.	0	-	-	-	0	0
OLIGOCHAETA	1	-	-	-	0	0
ORCONECTES SP.	0	-	-	-	2	0
PARACHIRONOMUS SP.	0	-	-	-	0	0
PARATENDIPES SP.	0	-	-	-	0	0
PLANARIIDAE	6	-	-	-	1	1
PLEUROCERA (SYN. OXYTREMA) SP.	1	-	-	-	0	0
PROCLADIUS SP.	1	-	-	-	0	0
PSEUDOCHIRONOMUS	0	-	-	-	0	0
SIALIS SP.	1	-	-	-	0	0
STENACRON SP.	0	-	-	-	10	0

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	FEB 1983						JUN 1983					
ABLABESMYIA SP.	0	-	0	0	0	0	-	0	0	-	-	-
ARGIA SP.	0	-	0	0	0	0	-	0	0	-	-	-
CAENIS SP.	1	-	0	0	0	0	-	1	0	-	-	-
CAMBARUS SP..	0	-	0	0	0	0	-	0	0	-	-	-
CHEUMATOPSYCHE SP.	0	-	0	0	0	0	-	0	0	-	-	-
CHIRONOMIDAE	2	-	0	1	0	0	-	7	18	-	-	-
COELOTANYPUS SP.	1	-	0	0	0	0	-	1	0	-	-	-
CORBICULA MANILENSIS	0	-	0	0	0	0	-	2	0	-	-	-
CRANGONYX SP.	0	-	0	0	0	0	-	0	1	-	-	-
CRYPTOCHIRONOMUS SP.	0	-	0	0	0	0	-	0	0	-	-	-
CYRNELLUS FRATERNUS	0	-	0	0	0	0	-	0	1	-	-	-
DICROTENDIPES SP.	0	-	0	0	0	0	-	0	0	-	-	-
ENALLAGMA SP.	1	-	0	0	0	0	-	1	0	-	-	-
ERPOBDELLIDAE	0	-	0	0	0	0	-	0	0	-	-	-
GLYPTOTENDIPES SP.	1	-	0	0	0	0	-	0	0	-	-	-
HEXAGENIA BILINEATA	2	-	0	0	0	0	-	2	0	-	-	-
HIRUDINEA	0	-	0	0	0	0	-	0	0	-	-	-
HYALELLA AZTECA	5	-	0	0	0	0	-	2	0	-	-	-
HYDROPSYCHE SP.	0	-	0	0	0	0	-	0	0	-	-	-
NAIDIDAE	0	-	0	0	0	0	-	0	0	-	-	-
NEMOURA SP.	0	-	1	0	0	0	-	0	0	-	-	-
OECETIS SP.	0	-	0	0	0	0	-	0	0	-	-	-
OLIGOCHAETA	1	-	0	0	0	0	-	0	0	-	-	-
ORCONECTES SP.	0	-	1	0	1	0	-	1	1	-	-	-
PHYSA SP.	0	-	0	0	0	0	-	0	1	-	-	-
PLANARIIDAE	0	-	0	0	0	0	-	0	0	-	-	-
PLEUROCERA (SYN. OXYTREMA) SP.	0	-	0	0	0	0	-	7	0	-	-	-
PROCLADIUS SP.	1	-	0	0	0	0	-	0	0	-	-	-
SIALIS SP.	0	-	0	0	0	0	-	0	0	-	-	-
STENACRON SP.	0	-	0	0	0	0	-	2	1	-	-	-

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1983						DEC 1983					
ABLABESMYIA SP.	0	0	0	0	-	0	1	0	0	0	0	0
ARGIA SP.	0	0	0	0	-	0	1	0	0	0	0	0
CAENIS SP.	0	0	0	0	-	0	0	0	0	0	0	0
CAMBARUS SP.	0	0	1	0	-	0	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	1	2	-	11	0	1	0	1	1	9
CHIRONOMIDAE	0	1	1	1	-	1	0	0	0	1	1	2
COELOTANYPUS SP.	1	1	0	0	-	0	2	5	0	0	0	0
CORBICULA MANILENSIS	1	0	0	0	-	0	0	1	0	0	0	0
CRANGONYX SP.	0	0	0	0	-	0	0	0	1	0	1	1
CRYPTOCHIRONOMUS SP.	0	0	0	0	-	0	1	2	0	0	0	0
CYRNELLUS FRATERNUS	1	1	23	117	-	65	1	0	1	0	1	1
DICROTENDIPES SP.	0	0	0	1	-	0	0	1	0	0	0	1
ENALLAGMA SP.	0	0	0	0	-	0	0	0	0	0	0	0
ERPOBDELLIDAE	0	0	0	0	-	0	0	0	0	0	1	0
GLYPTOTENDIPES SP.	0	0	0	1	-	1	0	0	0	0	1	0
HEXAGENIA BILINEATA	2	0	0	0	-	0	2	6	0	0	0	0
HIRUDINEA	0	1	0	0	-	0	0	0	1	0	0	0
HYALELLA AZTECA	0	0	0	1	-	0	1	1	0	1	1	0
HYDROPSYCHE SP.	0	0	0	1	-	1	0	0	0	1	0	0
NAIDIDAE	0	0	0	0	-	0	0	0	0	1	1	0
NEMOURA SP.	0	0	0	0	-	0	0	0	0	0	0	0
OECETIS SP.	0	0	0	0	-	0	0	1	0	0	0	0
OLIGOCHAETA	1	1	0	0	-	0	2	4	0	1	1	0
ORCONECTES SP.	0	0	1	1	-	2	0	0	0	0	1	1
PHYSA SP.	0	0	0	0	-	0	0	1	0	0	1	0
PLANARIIDAE	0	0	0	0	-	0	15	12	1	4	14	2
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	-	0	0	1	0	0	0	0
PROCLADIUS SP.	1	0	0	0	-	0	0	1	0	0	0	0
SIALIS SP.	1	0	0	0	-	0	1	0	0	0	0	0
STENACRON SP.	0	3	16	23	-	1	1	0	1	17	2	1

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1984						SEP 1984					
ABLABESMYIA SP.	1	0	1	1	0	0	1	1	1	1	0	0
ARGIA SP.	0	0	0	0	0	0	1	1	0	0	1	0
CAENIS SP.	1	1	0	0	0	0	0	0	1	1	1	1
CHAOBORUS SP.	1	0	0	0	1	0	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	0	0	0	0	0	1	44	28	8	91
CHIRONOMIDAE	9	2	0	2	5	2	0	1	39	29	29	35
CHIRONOMUS SP.	1	1	0	0	0	0	0	0	0	0	1	0
CLINOTANYPUS SP.	1	0	0	0	0	0	0	0	0	0	0	0
COELOTANYPUS SP.	6	6	0	0	0	0	1	1	0	0	0	0
CORBICULA MANILENSIS	1	3	0	0	0	0	1	0	0	1	1	1
CRANGONYX SP.	0	0	0	0	0	0	1	0	0	0	1	0
CRYPTOCHIRONOMUS SP.	1	1	0	0	0	0	0	1	0	0	0	0
CYRNELLUS FRATERNUS	0	0	0	1	1	1	7	24	32	330	86	112
DECAPODA	0	0	0	0	0	0	0	1	0	1	1	0
DICROTENDIPES SP.	3	0	1	0	0	0	0	0	6	0	1	8
DUGESIA TIGRINA	0	0	0	0	0	0	4	18	76	12	52	31
ENALLAGMA SP.	0	1	0	0	0	0	0	0	0	0	0	0
EPOICOCLADIUS SP.	0	0	0	0	0	0	0	0	0	0	0	0
FERRISSIA SP.	0	0	0	0	0	0	0	0	0	1	0	0
GLYPTOTENDIPES SP.	0	0	0	0	0	0	0	0	1	7	5	0
GYRAULUS SP.	1	2	0	0	0	0	0	0	0	0	0	1
HEXAGENIA BILINEATA	6	2	0	0	0	0	2	1	0	0	0	0
HYALELLA AZTECA	5	19	1	0	0	0	0	0	0	0	0	0
HYDRA AMERICANA	0	0	0	0	0	0	1	1	1	1	1	1
HYDROPSYCHE SP.	0	0	0	0	0	0	0	1	55	45	26	66
HYDROPTILA SP.	0	0	0	0	0	0	0	0	0	0	0	0
ISCHNURA SP.	0	1	0	0	0	0	0	0	0	0	0	0
LIRCEUS SP.	0	0	1	0	0	0	0	0	0	0	0	0
NAIDIDAE	0	0	0	0	0	0	0	0	0	0	0	0
NEMATA	0	0	0	0	0	0	0	1	0	0	0	0
OLIGOCHAETA	6	6	0	1	0	0	26	7	1	1	1	1

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1984						SEP 1984					
ORCONECTES SP.	0	0	1	0	1	0	0	1	1	1	1	2
PARACHIRONOMUS SP.	0	0	0	0	0	0	1	0	8	1	2	9
PARASITENGONA	0	1	0	0	0	0	0	0	0	0	0	0
PHYSA SP.	1	1	0	0	0	0	0	0	1	0	1	0
PLANARIIDAE	13	1	1	0	1	0	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	0	0	0	1	0	0	1	0	0	0	0
POLYPEDILUM SP.	0	0	0	0	0	0	0	1	0	0	0	1
PROCLADIUS SP.	3	2	0	0	0	0	1	0	0	0	0	0
PSEUDOCHIRONOMUS	0	0	0	0	1	0	0	0	0	0	0	0
SIALIS SP.	1	0	0	0	0	0	3	0	0	0	0	0
STENACRON SP.	0	0	0	1	4	0	1	8	29	13	19	3
TRIAENODES SP.	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.9
			DEC 1984			
ABLABESMYIA SP.	0	1	0	0	0	0
ARGIA SP.	0	0	0	0	0	0
CAENIS SP.	0	1	0	0	0	0
CHAOBORUS SP.	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	1	1	3	3	6
CHIRONOMIDAE	0	0	0	0	1	0
CHIRONOMUS SP.	0	0	0	0	0	0
CLINOTANYPUS SP.	0	0	0	0	0	0
COELOTANYPUS SP.	1	1	0	0	1	0
CORBICULA MANILENSIS	0	1	1	0	0	0
CRANGONYX SP.	0	1	0	0	1	0
CRYPTOCHIRONOMUS SP.	1	0	0	0	0	0
CYRNELLUS FRATERNUS	0	0	0	3	2	0
DECAPODA	0	0	0	0	0	0
DICROTENDIPES SP.	1	1	0	1	0	0
DUGESIA TIGRINA	9	5	1	10	3	4
ENALLAGMA SP.	0	0	0	0	0	0
EPOICOCLADIUS SP.	0	1	0	0	0	0
FERRISSIA SP.	0	0	0	0	0	0
GLYPTOTENDIPES SP.	0	0	0	0	0	0
GYRAULUS SP.	0	0	0	0	0	0
HEXAGENIA BILINEATA	3	1	0	0	0	0
HYALELLA AZTECA	1	0	0	0	0	0
HYDRA AMERICANA	0	1	1	1	0	1
HYDROPSYCHE SP.	0	0	0	0	3	0
HYDROPTILA SP.	0	0	0	1	0	0
ISCHNURA SP.	0	0	0	0	0	0
LIRCEUS SP.	0	0	0	0	0	0
NAIDIDAE	0	0	0	1	1	0
NEMATA	0	0	0	0	0	0
OLIGOCHAETA	8	7	0	0	1	1
ORCONECTES SP.	0	1	0	1	0	0

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.9
			DEC 1984			
PARACHIRONOMUS SP.	0	0	0	0	0	0
PARASITENGONA	0	0	0	0	0	0
PHYSA SP.	0	0	1	1	0	1
PLANARIIDAE	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	0	0
POLYPEDILUM SP.	0	0	0	0	0	0
PROCLADIUS SP.	0	0	0	0	0	0
PSEUDOCHIRONOMUS	0	0	0	0	0	0
SIALIS SP.	1	1	0	0	0	0
STENACRON SP.	1	1	2	1	13	0
TRIAENODES SP.	1	0	0	0	0	0

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1985						MAY 1985					
ABLABESMYIA SP.	0	0	0	0	0	0	1	0	0	0	0	0
AMNICOLA SP.	0	0	0	0	0	0	1	0	0	0	5	0
AMPHINEMURA SP.	0	0	1	0	0	0	0	0	0	0	0	0
ANCULOSA SP.	0	0	0	0	0	0	0	0	0	0	0	0
ARGIA SP.	0	1	0	0	0	0	0	0	0	0	1	1
ASELLUS SP.	0	0	0	0	0	0	0	0	0	0	1	0
CAENIS SP.	0	1	0	0	0	0	1	1	0	0	0	0
CAMBARUS SP..	0	0	0	0	0	0	0	0	0	0	1	0
CAMPELOMA SP.	0	0	0	0	0	0	0	0	0	0	0	0
CERACLEA SP.	0	0	0	0	0	0	0	0	0	0	1	0
CERATOPOGONIDAE	1	0	0	0	0	0	0	0	0	0	0	1
CHAOBORUS SP.	0	0	0	0	0	0	0	0	0	0	0	1
CHEUMATOPSYCHE SP.	0	0	0	1	0	1	0	0	0	0	0	0
CHIRONOMIDAE	2	2	1	2	1	1	1	1	2	4	2	0
CHIRONOMUS SP.	1	0	0	0	0	0	0	0	0	0	1	0
COELOTANYPUS SP.	2	5	0	0	0	0	1	1	0	0	0	0
CORBICULA MANILENSIS	0	1	0	0	0	0	1	0	0	1	1	0
CRANGONYX SP.	0	0	0	0	0	1	0	0	1	13	6	0
CRYPTOCHIRONOMUS SP.	0	1	0	0	0	0	0	0	0	0	0	0
CYRNELLUS FRATERNUS	0	0	0	1	1	1	0	1	3	6	8	0
DICROTENDIPES SP.	1	0	0	0	0	0	0	0	1	1	1	0
ENALLAGMA SP.	1	1	0	0	0	0	1	0	0	0	0	0
EPITHECA SP.	0	1	0	0	0	0	0	0	0	0	0	0
ERPOBDELLIDAE	0	0	0	0	0	0	0	0	1	0	0	0
GAMMARUS SP.	1	0	0	0	0	0	0	0	0	0	0	0
GLOSSIPHONIIDAE	0	0	0	0	0	0	0	0	0	0	1	0
GLYPTOTENDIPES SP.	0	0	0	0	0	0	1	0	1	1	2	0
GYRAULUS SP.	0	0	0	1	0	0	0	0	1	0	1	0
HEXAGENIA BILINEATA	3	1	0	0	0	0	4	1	0	0	0	1
HIRUDINEA	0	0	0	0	0	0	0	0	0	0	0	0
HYALELLA AZTECA	1	2	0	0	0	0	0	1	0	0	0	1
HYDRA SP.	1	0	1	1	0	0	0	0	1	1	1	1

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1985						MAY 1985					
HYDROPTILA SP.	0	0	0	0	0	0	0	0	1	0	1	0
ISCHNURA SP.	0	2	0	0	0	0	0	0	0	0	0	0
LEPTOCERIDAE	0	0	0	0	0	0	0	0	0	1	0	0
NAIDIDAE	0	0	1	0	0	1	0	0	0	1	1	0
NEUROCORDULIA SP.	0	0	0	0	0	0	0	0	0	0	0	0
OECETIS SP.	0	0	0	0	0	0	1	0	0	0	0	0
OLIGOCHAETA	6	6	0	0	0	1	9	4	0	0	0	2
ORCONECTES SP.	0	0	1	1	0	1	1	0	1	1	0	0
PARACHIRONOMUS SP.	0	0	0	0	0	0	0	1	1	1	1	30
PHYSA SP.	0	0	1	1	0	1	0	1	2	1	3	2
PLANARIIDAE	1	0	2	5	3	4	4	1	5	16	14	15
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	0	0	0	1	0	0	0	0
POLYPEDILUM SP.	0	0	0	0	0	0	0	0	0	0	0	0
PROCLADIUS SP.	3	1	0	0	0	0	0	1	0	0	0	0
SIALIS SP.	0	1	0	0	0	0	0	0	0	0	0	0
SPHAERIUM SP.	0	0	0	0	0	0	1	0	0	0	0	0
STENACRON SP.	1	0	1	1	6	0	1	0	1	1	0	0
TAENIOPTERYX SP.	0	0	1	0	0	0	0	0	0	0	0	0
TANYPUS SP.	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1985						DEC 1985					
ABLABESMYIA SP.	1	0	0	0	0	-	0	0	0	0	0	0
AMNICOLA SP.	0	0	0	0	0	-	0	0	0	0	0	0
AMPHINEMURA SP.	0	0	0	0	0	-	0	0	0	0	0	0
ANCULOSA SP.	0	0	0	0	0	-	1	0	0	0	0	0
ARGIA SP.	0	0	0	0	0	-	0	0	0	0	0	0
ASELLUS SP.	0	1	1	0	0	-	0	0	0	0	0	0
CAENIS SP.	0	1	0	1	0	-	1	0	0	0	0	0
CAMBARUS SP..	0	0	0	0	1	-	1	0	0	0	0	0
CAMPELOMA SP.	0	0	0	0	0	-	1	0	0	0	0	0
CERACLEA SP.	0	0	0	0	0	-	0	0	0	0	0	0
CERATOPOGONIDAE	0	0	0	0	0	-	0	1	0	0	0	0
CHAOBORUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	0	0	0	-	0	0	0	0	0	0
CHIRONOMIDAE	0	0	3	0	0	-	0	0	0	0	0	0
CHIRONOMUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
COELOTANYPUS SP.	0	1	0	0	0	-	2	1	0	0	0	0
CORBICULA MANILENSIS	0	1	0	1	0	-	0	1	0	0	0	0
CRANGONYX SP.	1	0	2	1	0	-	0	0	0	0	0	0
CRYPTOCHIRONOMUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
CYRNELLUS FRATERNUS	67	6	11	3	52	-	1	0	0	1	1	0
DICROTENDIPES SP.	5	0	4	0	2	-	0	0	0	0	1	0
ENALLAGMA SP.	0	0	0	0	0	-	0	1	0	0	0	0
EPITHECA SP.	0	0	0	0	0	-	0	0	0	0	0	0
ERPOBDELLIDAE	0	0	0	0	0	-	0	0	0	0	0	0
GAMMARUS SP.	3	0	0	1	3	-	2	1	0	0	0	0
GLOSSIPHONIIDAE	0	0	0	0	0	-	0	0	0	0	0	0
GLYPTOTENDIPES SP.	2	0	0	0	3	-	0	0	1	0	1	0
GYRAULUS SP.	0	0	0	0	0	-	1	1	0	0	0	0
HEXAGENIA BILINEATA	0	1	0	1	0	-	1	1	0	0	0	0
HIRUDINEA	0	0	0	0	0	-	1	1	0	0	0	0
HYALELLA AZTECA	0	0	0	0	0	-	0	0	0	0	0	0
HYDRA SP.	0	0	1	0	0	-	0	0	1	1	1	1

Appendix 7-A (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1985						DEC 1985					
HYDROPTILA SP.	0	0	0	0	0	-	0	0	0	0	0	0
ISCHNURA SP.	0	0	0	0	0	-	0	0	0	0	0	0
LEPTOCERIDAE	0	0	0	0	0	-	0	0	0	0	0	0
NAIDIDAE	0	0	0	0	0	-	0	0	0	0	0	0
NEUROCORDULIA SP.	0	0	0	0	0	-	0	1	0	0	0	0
OECETIS SP.	0	0	0	0	0	-	0	1	0	0	0	0
OLIGOCHAETA	0	2	0	4	0	-	4	1	0	0	0	0
ORCONECTES SP.	1	1	1	0	1	-	0	0	0	0	0	0
PARACHIRONOMUS SP.	1	0	3	0	1	-	0	0	1	0	1	0
PHYSA SP.	0	0	0	0	0	-	0	1	0	0	0	0
PLANARIIDAE	25	1	10	0	4	-	9	2	1	1	1	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	1	-	0	1	0	0	0	0
POLYPEDILUM SP.	0	1	0	0	0	-	0	0	0	0	0	0
PROCLADIUS SP.	0	0	0	0	0	-	1	1	0	0	0	0
SIALIS SP.	0	1	0	1	0	-	2	0	0	0	0	0
SPHAERIUM SP.	0	0	0	0	0	-	0	0	0	0	0	0
STENACRON SP.	12	1	4	0	9	-	0	1	1	2	0	0
TAENIOPTERYX SP.	0	0	0	0	0	-	0	0	0	0	0	0
TANYPUS SP.	0	0	1	0	0	-	0	0	0	0	0	0

*Samples not retrieved.

APPENDIX 7-B

AVERAGE ABUNDANCE OF BENTHIC MACROINVERTEBRATES
COLLECTED FROM ARTIFICIAL SUBSTRATES FOLLOWING ONE-MONTH
COLONIZATION PERIODS NEAR WATTS BAR NUCLEAR PLANT,
WINTER 1983 THROUGH AUTUMN 1985
(BAGGED COLLECTION)

Appendix 7-B. Average Abundance of Benthic Macroinvertebrates Collected from Artificial Substrates Following One-Month Colonization Periods Near Watts Bar Nuclear Plant, Winter 1983 through Autumn 1985 (Bagged Collection).

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	FEB 1983						SEP 1983					
ABLABESMYIA SP.	1	–+	0	0	–	0	0	0	0	0	–	0
CAENIS SP.	2	–	0	0	–	0	1	0	0	0	–	0
CHAOBORUS SP.	1	–	0	0	–	0	0	0	0	0	–	0
CHEUMATOPSYCHE SP.	0	–	0	0	–	0	0	0	3	3	–	7
CHIRONOMIDAE	22	–	0	1	–	0	0	0	1	1	–	3
COELOTANYPUS SP.	2	–	0	0	–	0	0	1	0	0	–	0
CORBICULA MANILENSIS	0	–	0	0	–	0	1	1	1	1	–	0
CRANGONYX SP.	0	–	0	0	–	0	0	1	6	0	–	1
CRYPTOCHIRONOMUS SP.	0	–	0	0	–	0	0	0	0	0	–	0
CYRNELLUS FRATERNUS	0	–	0	0	–	0	1	7	36	258	–	89
DICROTENDIPES SP.	0	–	0	0	–	0	0	0	0	1	–	0
DIPTERA	0	–	0	0	–	0	0	0	0	1	–	0
DUGESIA TIGRINA	1	–	0	0	–	0	0	0	0	0	–	0
ENALLAGMA SP.	4	–	0	0	–	0	0	0	0	0	–	0
GLYPTOTENDIPES SP.	0	–	0	0	–	0	0	0	0	1	–	0
GYRAULUS SP.	0	–	0	0	–	0	0	0	0	0	–	0
HEXAGENIA BILINEATA	1	–	0	0	–	0	1	1	0	0	–	0
HIRUDINEA	0	–	0	0	–	0	0	0	1	0	–	1
HYALELLA AZTECA	15	–	0	0	–	0	0	0	0	0	–	0
HYDROPSYCHE SP.	0	–	0	0	–	0	0	0	2	1	–	3
HYDROPTILA SP.	0	–	0	0	–	0	0	0	0	0	–	0
ISCHNURA SP.	1	–	0	0	–	0	0	0	0	0	–	0
LIRCEUS SP.	0	–	0	0	–	0	0	0	0	0	–	0
NAIDIDAE	0	–	0	0	–	0	0	0	0	0	–	0
NEURECLIPSIS SP.	0	–	0	0	–	0	0	0	0	0	–	0
NEUROCORDULIA SP.	0	–	0	0	–	0	0	0	0	0	–	0
OECETIS SP.	0	–	0	0	–	0	0	0	0	0	–	0
OLIGOCHAETA	1	–	0	0	–	0	7	4	0	0	–	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	FEB 1983						SEP 1983					
ORCONECTES SP.	0	-	1	0	-	0	0	0	1	2	-	1
PARACHIRONOMUS SP.	0	-	0	0	-	0	0	1	0	0	-	0
PARATENDIPES SP.	0	-	0	0	-	0	1	0	0	0	-	0
PHYSA SP.	1	-	0	0	-	0	0	0	0	0	-	0
PLANARIIDAE	0	-	0	0	-	0	0	0	0	0	-	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	-	0	0	-	0	0	2	0	0	-	0
PROCLADIUS SP.	1	-	0	0	-	0	1	1	0	0	-	0
SIALIS SP.	0	-	0	0	-	0	0	1	0	0	-	0
STENACRON SP.	0	-	1	0	-	1	1	5	2	40	-	1

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.5
			DEC 1983			
ABLABESMYIA SP.	0	0	0	0	0	0
CAENIS SP.	2	1	0	0	0	0
CHAOBORUS SP.	1	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	1	1	0	9
CHIRONOMIDAE	0	0	0	1	1	2
COELOTANYPUS SP.	2	1	0	0	0	0
CORBICULA MANILENSIS	1	1	0	0	1	0
CRANGONYX SP.	0	0	2	0	0	0
CRYPTOCHIRONOMUS SP.	1	1	0	0	0	0
CYRNELLUS FRATERNUS	0	0	0	2	1	3
DICROTENDIPES SP.	1	0	0	0	0	0
DIPTERA	0	0	0	0	0	0
DUGESIA TIGRINA	0	0	0	0	0	0
ENALLAGMA SP.	1	1	1	0	0	0
GAMMARUS SP.	0	0	1	0	1	0
GLYPTOTENDIPES SP.	0	0	0	0	1	0
GYRAULUS SP.	1	1	1	0	0	0
HEXAGENIA BILINEATA	3	3	0	0	0	0
HIRUDINEA	0	0	0	0	0	0
HYALELLA AZTECA	3	2	5	1	1	0
HYDROPSYCHE SP.	0	0	0	0	0	1
HYDROPTILA SP.	0	0	0	1	0	0
ISCHNURA SP.	0	1	0	0	0	0
LIRCEUS SP.	0	0	0	0	0	1
NAIDIDAE	0	0	0	1	0	0
NEURECLIPSIS SP.	0	0	0	0	1	0
NEUROCORDULIA SP.	1	1	0	0	0	0
OECETIS SP.	1	0	0	0	0	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.5
			DEC 1983			
OLIGOCHAETA	4	1	0	0	0	0
ORCONECTES SP.	0	1	1	1	1	1
PARACHIRONOMUS SP.	0	0	0	0	1	1
PARATENDIPES SP.	0	0	0	0	0	0
PHYSA SP.	1	1	1	0	1	0
PLANARIIDAE	45	4	1	5	6	2
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	1	0	0
PROCLADIUS SP.	1	0	0	0	0	0
SIALIS SP.	1	0	0	0	0	0
STENACRON SP.	1	1	1	14	3	1

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1984						SEP 1984					
ABLABESMYIA SP.	0	1	0	0	0	0	1	1	1	1	1	0
AGRAYLEA SP.	0	0	0	0	0	0	0	0	0	0	0	0
ARGIA SP.	0	0	0	0	0	0	1	1	0	0	1	0
ASELLUS SP.	0	0	1	0	0	0	0	0	0	0	0	0
BIVALVIA	0	0	0	0	0	0	1	0	0	0	0	0
CAENIS SP.	1	0	0	0	0	0	0	0	1	1	1	1
CAMPELOMA SP.	0	0	0	0	0	0	1	0	0	0	0	0
CHAOBORUS SP.	1	0	0	0	0	0	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	0	0	0	0	1	1	28	27	61	122
CHIRONOMIDAE	8	4	1	3	5	4	1	1	69	47	89	91
CHIRONOMUS SP.	2	1	0	0	0	0	0	0	0	0	0	0
COELOTANYPUS SP.	2	6	1	0	0	0	4	1	0	0	0	1
CORBICULA MANILENSIS	0	1	1	0	0	0	0	1	1	5	23	0
CRANGONYX SP.	0	0	0	0	0	0	1	1	0	6	1	1
CRYPTOCHIRONOMUS SP.	1	1	0	0	0	0	0	0	0	0	0	0
CURA FOREMANII	0	0	0	0	0	0	0	0	0	0	0	0
CYRNELLUS FRATERNUS	0	0	0	1	0	0	7	20	40	318	255	81
DECAPODA	0	0	0	0	0	0	1	0	1	0	1	1
DICROTENDIPES SP.	5	1	0	0	0	0	0	0	24	0	7	0
DROMOGOMPHUS SP.	0	0	0	0	0	0	0	0	0	0	0	0
DUGESIA TIGRINA	0	0	0	0	0	0	4	13	163	52	76	36
ENALLAGMA SP.	1	2	0	0	0	0	0	0	0	0	0	0
FERRISSIA SP.	0	0	0	0	0	0	0	0	1	0	1	1
GLYPTOTENDIPES SP.	0	0	0	0	0	0	0	0	3	7	1	7
GOMPHUS SP.	1	0	0	0	0	0	0	0	0	0	0	0
GYRAULUS SP.	1	2	0	0	0	0	0	0	0	0	0	0
HEXAGENIA BILINEATA	4	4	1	0	0	0	1	1	0	0	0	0
HYALELLA AZTECA	12	49	3	0	0	0	0	0	0	0	0	0
HYDRA AMERICANA	0	0	0	0	0	0	1	1	1	1	1	1
HYDROPSYCHE SP.	0	0	0	0	0	1	1	2	47	32	44	63
HYDROPTILA SP.	1	0	0	0	0	0	0	0	0	0	0	0
ISCHNURA SP.	0	1	0	0	0	0	0	0	0	0	0	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1984						SEP 1984					
LIBELLULIDAE	0	0	0	0	0	0	0	0	0	1	1	0
LIRCEUS SP.	0	0	0	0	0	0	0	0	0	0	0	0
NAIDIDAE	1	0	0	0	0	1	0	0	0	0	0	0
NEMATA	0	0	0	0	0	0	1	0	0	1	0	0
OECETIS SP.	0	0	0	0	0	0	0	0	0	0	0	1
OLIGOCHAETA	4	5	1	1	0	0	23	13	14	3	4	2
ORCONECTES SP.	0	0	1	0	1	0	0	1	1	1	1	1
PARACHIRONOMUS SP.	1	0	0	0	0	0	0	1	25	3	3	5
PHYSA SP.	0	1	0	0	0	0	0	0	1	0	1	1
PLANARIIDAE	18	1	1	1	1	0	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	0	0	0	0	0	0	1	0	0	0	0
PROCLADIUS SP.	3	0	1	0	0	1	2	1	0	0	0	0
PSEUDOCHIRONOMUS	0	0	0	1	0	0	0	0	0	0	0	0
SIALIS SP.	1	1	0	0	0	0	4	0	0	0	0	0
SPHAERIUM SP.	1	0	0	0	0	0	0	1	0	0	0	0
STENACRON SP.	0	1	0	0	1	0	1	4	37	42	30	4

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.5
			DEC 1984			
ABLABESMYIA SP.	0	0	0	0	0	0
AGRAYLEA SP.	1	0	0	0	0	0
ARGIA SP.	0	1	0	0	0	0
ASELLUS SP.	0	0	0	0	0	0
BIVALVIA	0	0	0	0	0	0
CAENIS SP.	1	1	0	0	0	0
CAMPELOMA SP.	0	0	0	0	0	0
CHAOBORUS SP.	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	1	0	2	5	4	8
CHIRONOMIDAE	0	0	0	0	1	1
CHIRONOMUS SP.	0	0	0	0	0	0
COELOTANYPUS SP.	4	2	0	0	0	0
CORBICULA MANILENSIS	0	1	1	0	0	0
CRANGONYX SP.	1	0	2	0	0	0
CRYPTOCHIRONOMUS SP.	0	0	0	0	0	0
CURA FOREMANII	0	2	0	0	0	0
CYRNELLUS FRATERNUS	1	1	1	3	3	0
DECAPODA	0	0	0	0	0	0
DICROTENDIPES SP.	0	0	0	1	0	0
DROMOGOMPHUS SP.	1	1	0	0	0	0
DUGESIA TIGRINA	9	0	12	4	6	3
ENALLAGMA SP.	1	1	0	0	0	0
FERRISSIA SP.	0	0	0	0	0	0
GLYPTOTENDIPES SP.	0	1	0	0	0	1
GOMPHUS SP.	0	0	0	0	0	0
GYRAULUS SP.	0	0	1	0	0	0
HEXAGENIA BILINEATA	5	2	0	0	0	0
HYALELLA AZTECA	0	1	0	0	0	0
HYDRA AMERICANA	0	0	1	1	1	1
HYDROPSYCHE SP.	0	0	0	0	0	2
HYDROPTILA SP.	0	0	0	0	0	0
ISCHNURA SP.	0	0	0	0	0	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.5
	DEC 1984					
LIBELLULIDAE	0	0	0	0	0	0
LIRCEUS SP.	0	0	1	0	0	0
NAIDIDAE	1	0	0	2	3	0
NEMATA	0	0	0	0	0	0
OECETIS SP.	1	0	0	0	0	0
OLIGOCHAETA	14	7	0	0	1	0
ORCONECTES SP.	0	0	1	1	0	0
PARACHIRONOMUS SP.	0	0	0	0	0	0
PHYSA SP.	0	0	0	0	1	0
PLANARIIDAE	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	0	0	0	0	0
PROCLADIUS SP.	1	0	0	0	0	0
PSEUDOCHIRONOMUS	0	0	0	0	0	0
SIALIS SP.	0	1	0	0	0	0
SPHAERIUM SP.	0	0	0	0	0	0
STENACRON SP.	1	1	6	2	6	1

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1985						MAY 1985					
ABLABESMYIA SP.	1	0	0	0	0	0	1	0	0	0	0	0
AMNICOLA SP.	0	0	0	0	0	0	1	2	0	0	22	0
ARGIA SP.	0	0	0	0	0	0	1	1	0	0	0	0
ASELLUS SP.	0	0	0	0	0	0	1	0	0	1	0	0
CAENIS SP.	1	1	0	0	0	0	2	1	0	0	0	0
CAMBARUS SP..	0	0	1	0	0	1	0	0	0	0	0	0
CAMPELOMA SP.	0	0	0	0	0	0	0	0	0	0	0	0
CERACLEA SP.	0	0	0	0	0	0	0	0	0	1	1	0
CERATOPOGONIDAE	1	0	0	0	0	0	0	0	0	0	0	0
CHAOBORUS SP.	0	0	0	0	0	0	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	1	0	1	3	0	1	0	0	0	0	0	0
CHIRONOMIDAE	10	1	1	3	5	7	0	1	4	2	1	10
CHIRONOMUS SP.	1	0	0	0	1	0	0	0	1	1	0	0
CLINOTANYPUS SP.	0	0	0	0	0	0	0	1	0	0	0	0
COELOTANYPUS SP.	6	1	0	0	1	0	1	0	0	0	0	0
CORBICULA MANILENSIS	1	1	0	0	0	0	1	0	1	1	4	1
CRANGONYX SP.	0	0	0	0	0	0	0	0	7	48	54	0
CRYPTOCHIRONOMUS SP.	0	0	0	0	0	0	1	0	0	0	0	0
CYRNELLUS FRATERNUS	0	0	0	0	1	0	1	1	2	3	9	0
DICROTENDIPES SP.	2	1	0	0	0	0	0	0	2	4	3	0
DROMOGOMPHUS SP.	0	0	0	0	0	0	0	0	0	0	0	0
ELMIDAE	0	0	0	0	0	0	0	0	0	0	0	0
ENALLAGMA SP.	5	1	0	0	0	0	1	1	0	0	0	0
EPOICOCLADIUS SP.	0	0	0	0	0	0	1	0	0	0	0	0
EURYLOPHELLA	0	0	1	0	0	0	0	0	0	0	0	0
FERRISSIA SP.	0	0	0	0	0	1	0	0	0	0	0	0
GAMMARUS SP.	1	0	0	0	0	0	1	0	3	3	2	0
GLYPTOTENDIPES SP.	1	0	0	0	0	0	0	0	0	2	3	0
GOMPHIDAE	0	0	0	0	0	0	0	1	0	0	0	0
GOMPHUS SP.	0	0	0	0	0	0	1	0	0	0	0	0
GYRAULUS SP.	1	0	0	1	0	0	0	1	1	0	0	0
HEXAGENIA BILINEATA	8	2	0	0	1	0	7	1	0	0	0	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	MAR 1985						MAY 1985					
HIRUDINEA	0	0	0	0	0	0	0	0	0	0	0	0
HYALELLA AZTECA	4	13	0	1	0	0	0	7	1	0	0	0
HYDRA SP.	0	0	1	1	1	1	0	0	1	0	0	1
HYDROPSYCHE SP.	0	0	0	0	0	1	0	0	0	0	0	0
HYDROPTILA SP.	1	0	0	0	0	0	0	1	1	0	1	0
ISCHNURA SP.	0	1	0	0	0	0	0	0	0	0	0	0
NAIDIDAE	0	0	0	0	0	0	1	0	0	1	0	0
NEUROCORDULIA SP.	1	0	0	0	0	0	0	0	0	1	0	0
OLIGOCHAETA	5	3	0	1	2	0	6	3	0	0	1	0
ORCONECTES SP.	0	0	0	1	1	1	0	1	1	1	1	1
ORTHOTRICHIA SP.	0	0	0	0	0	0	1	0	0	0	0	0
PARACHIRONOMUS SP.	0	0	0	0	0	0	0	1	0	1	1	31
PHYSA SP.	0	0	0	0	0	0	0	1	4	1	3	2
PLANARIIDAE	2	0	1	3	6	2	5	1	6	6	8	7
PLEUROCERA (SYN. OXYTREMA) SP.	0	0	0	0	0	0	0	2	1	0	1	0
PROCLADIUS SP.	7	1	0	0	0	0	1	1	0	0	1	0
SIALIS SP.	0	0	0	0	0	0	1	0	0	0	0	0
SPHAERIUM SP.	0	0	0	0	0	0	1	0	0	0	0	0
STENACRON SP.	1	1	2	3	14	1	1	1	3	0	1	0
STICTOCHIRONOMUS SP.	0	0	0	0	0	0	1	0	0	0	0	0
VIVIPARUS SP.	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1985						DEC 1985					
ABLABESMYIA SP.	1	0	2	1	1		0	0	0	0	0	0
AMNICOLA SP.	0	0	0	0	0		0	0	0	0	0	0
ARGIA SP.	0	0	0	0	0		0	1	0	0	0	0
ASELLUS SP.	1	0	0	0	0		0	0	0	0	0	0
CAENIS SP.	0	1	0	1	0		0	2	0	0	0	0
CAMBARUS SP..	0	0	0	0	0		0	0	0	0	0	0
CAMPELOMA SP.	0	0	0	0	0		0	1	0	0	0	0
CERACLEA SP.	0	0	0	0	0		0	0	0	0	0	0
CERATOPOGONIDAE	0	0	0	0	0		0	0	0	0	0	0
CHAOBORUS SP.	0	0	0	1	0		0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	0	0	0		0	0	0	0	0	0
CHIRONOMIDAE	1	0	2	0	0		0	0	0	0	0	1
CHIRONOMUS SP.	0	0	0	0	0		0	0	0	0	0	0
CLINOTANYPUS SP.	0	0	0	0	0		0	0	0	0	0	0
COELOTANYPUS SP.	0	1	1	1	0		2	3	0	0	0	0
CORBICULA MANILENSIS	0	0	0	0	0		0	1	1	1	0	0
CRANGONYX SP.	2	0	22	1	3		3	3	0	0	0	0
CRYPTOCHIRONOMUS SP.	0	0	0	0	0		0	0	0	0	0	0
CYRNELLUS FRATERNUS	49	5	12	18	70		1	0	0	0	2	0
DICROTENDIPES SP.	2	0	3	1	5		1	0	0	1	1	0
DROMOGOMPHUS SP.	0	1	0	0	0		0	0	0	0	0	0
ELMIDAE	0	0	0	0	0		0	1	0	0	0	0
ENALLAGMA SP.	0	0	0	0	1		0	6	0	0	0	0
EPOICOCLADIUS SP.	0	0	0	0	0		0	0	0	0	0	0
EURYLOPHELLA	0	0	0	0	0		0	0	0	0	0	0
FERRISSIA SP.	0	0	0	0	0		0	0	0	0	0	0
GAMMARUS SP.	2	1	0	1	1		2	12	1	11	1	0
GLYPTOTENDIPES SP.	1	0	0	1	1		0	1	0	1	0	0
GOMPHIDAE	0	0	0	0	0		0	0	0	0	0	0
GOMPHUS SP.	0	0	0	0	0		0	0	0	0	0	0
GYRAULUS SP.	0	0	0	0	0		0	0	0	0	0	0
HEXAGENIA BILINEATA	0	1	0	1	0		0	0	0	0	0	0

Appendix 7-B (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1985						DEC 1985					
HIRUDINEA	0	0	1	0	1		0	1	0	1	0	0
HYALELLA AZTECA	0	0	0	0	0		0	0	0	0	0	0
HYDRA SP.	0	0	1	0	0		0	0	1	1	1	1
HYDROPSYCHE SP.	0	0	0	0	0		0	0	0	0	0	0
HYDROPTILA SP.	0	0	0	0	0		0	0	0	0	0	0
ISCHNURA SP.	0	0	0	0	0		0	0	0	0	0	0
NAIDIDAE	0	0	0	0	0		0	0	0	0	0	0
NEUROCORDULIA SP.	0	0	1	0	0		0	1	0	1	0	0
OLIGOCHAETA	2	1	0	6	0		9	2	0	0	0	0
ORCONECTES SP.	0	1	1	1	1		0	1	1	0	1	0
ORTHOTRICHIA SP.	0	0	0	0	0		0	0	0	0	0	0
PARACHIRONOMUS SP.	2	0	1	1	1		1	0	0	0	0	0
PHYSA SP.	0	0	0	0	0		0	1	0	0	0	0
PLANARIIDAE	9	1	17	3	20		6	1	0	1	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	1		0	1	0	0	0	0
PROCLADIUS SP.	1	1	1	0	0		1	0	0	0	0	0
SIALIS SP.	1	1	0	1	0		1	1	0	0	0	0
SPHAERIUM SP.	0	0	0	0	0		0	0	0	0	0	0
STENACRON SP.	4	1	3	3	17		1	1	2	1	1	0
STICTOCHIRONOMUS SP.	0	0	0	0	0		0	0	0	0	0	0
VIVIPARUS SP.	0	1	0	0	0		0	0	0	0	0	0

+Samples not retrieved.

APPENDIX 7-C

AVERAGE ABUNDANCE OF BENTHIC MACROINVERTEBRATES
COLLECTED FROM ARTIFICIAL SUBSTRATES FOLLOWING THREE-MONTH
COLONIZATION PERIODS NEAR WATTS BAR NUCLEAR PLANT,
SPRING 1973 THROUGH AUTUMN 1985
(UNBAGGED COLLECTION)

Appendix 7-C. Average Abundance of Benthic Macroinvertebrates Collected from Artificial Substrates Following Three-Month Colonization Periods Near Watts Bar Nuclear Plant, Spring 1973 through Autumn 1985 (Unbagged Collection).

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.9	496.5	506.6	518.0	527.4	528.0	529.9
	MAY 1973						AUG 1973					
ARGIA SP.	0	-*	0	0	0	0	-	0	-	-	-	-
BRANCHIURA SP.	2	-	0	0	0	0	-	0	-	-	-	-
BRYOZOA	2	-	0	0	0	0	-	0	-	-	-	-
CHEUMATOPSYCHE SP.	0	-	0	0	0	0	-	0	-	-	-	-
CHIRONOMIDAE	6	-	12	67	52	139	-	25	-	-	-	-
CORBICULA MANILENSIS	5	-	1	0	0	0	-	0	-	-	-	-
CYRNELLUS FRATERNUS	0	-	0	0	0	0	-	0	-	-	-	-
CRANGONYX SP.	0	-	0	0	0	1	-	0	-	-	-	-
HEXAGENIA BILINEATA	0	-	0	0	0	0	-	0	-	-	-	-
HIRUDINEA	0	-	0	0	0	0	-	0	-	-	-	-
ODONATA	1	-	0	0	0	0	-	0	-	-	-	-
ORCONECTES SP.	0	-	1	0	0	0	-	0	-	-	-	-
PROCLADIUS SP.	0	-	0	0	0	0	-	0	-	-	-	-
PROPTERA ALATA	0	-	0	0	0	0	-	0	-	-	-	-
STENACRON SP.	0	-	0	0	0	0	-	5	-	-	-	-
TRICHOPTERA	3	-	2	0	0	3	-	76	-	-	-	-
XENOCHIRONOMUS SP.	0	-	0	0	0	0	-	0	-	-	-	-

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.9
	NOV 1973					
ARGIA SP.	0	0	0	1	0	0
BRANCHIURA SP.	0	0	0	0	0	0
BRYOZOA	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	2	57	397	158	9	8
CHIRONOMIDAE	0	10	2	4	11	23
CORBICULA MANILENSIS	8	4	0	3	1	0
CYRNELLUS FRATERNUS	13	5	13	110	116	257
CRANGONYX SP.	0	0	0	0	0	0
HEXAGENIA BILINEATA	2	0	0	0	0	0
HIRUDINEA	0	0	0	2	3	3
ODONATA	0	0	0	0	0	0
ORCONECTES SP.	0	0	0	0	0	0
PROCLADIUS SP.	1	0	0	0	0	0
PROPTERA ALATA	0	1	0	0	0	0
STENACRON SP.	0	0	4	12	15	5
TRICHOPTERA	0	0	0	0	0	0
XENOCHIRONOMUS SP.	0	0	0	0	2	0

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.9	496.5	506.6	518.0	527.4	528.0	529.9
	MAY 1974						AUG 1974					
ARGIA SP.	0	0	0	0	-	0	-	0	0	0	0	-
BRYOZOA	0	0	0	0	-	3	-	1	1	1	1	-
CHAOBORUS SP.	0	0	0	0	-	0	-	0	0	0	0	-
CHEUMATOPSYCHE SP.	0	1	0	1	-	0	-	16	4	3	3	-
CORBICULA MANILENSIS	3	0	0	0	-	0	-	0	0	0	0	-
CURA FOREMANII	0	0	0	0	-	0	-	0	0	0	0	-
CYRNELLUS FRATERNUS	0	0	0	0	-	0	-	3	5	4	4	-
HIRUDINEA	0	1	0	0	-	0	-	0	0	0	0	-
OLIGOCHAETA	0	0	0	0	-	0	-	0	0	0	0	-
ORCONECTES SP.	0	0	0	0	-	1	-	0	0	0	0	-
PARACHIRONOMUS SP.	1	0	14	27	-	26	-	10	3	11	15	-
STENACRON SP.	0	0	0	0	-	0	-	1	1	4	6	-
TRICHOPTERA	1	0	0	0	-	0	-	0	0	0	0	-
XENOCHIRONOMUS SP.	0	0	0	0	-	0	-	0	0	1	0	-

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.9
			NOV 1974			
ARGIA SP.	1	-	0	-	0	-
BRYOZOA	1	-	1	-	1	-
CHAOBORUS SP.	1	-	0	-	0	-
CHEUMATOPSYCHE SP.	1	-	3	-	1	-
CORBICULA MANILENSIS	0	-	0	-	0	-
CURA FOREMANII	4	-	0	-	0	-
CYRNELLUS FRATERNUS	1	-	0	-	1	-
HIRUDINEA	0	-	0	-	0	-
OLIGOCHAETA	5	-	0	-	0	-
ORCONECTES SP.	0	-	0	-	0	-
PARACHIRONOMUS SP.	1	-	1	-	4	-
STENACRON SP.	0	-	2	-	1	-
TRICHOPTERA	0	-	0	-	0	-
XENOCHIRONOMUS SP.	1	-	0	-	0	-

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.9
			FEB 1975			
BRYOZOA	1	1	1	1	1	1
CHAOBORUS SP.	1	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	4	6	3	3	0
CHIRONOMUS SP.	1	0	0	0	0	0
COELOTANYPUS SP.	1	0	0	0	0	0
CYRNELLUS FRATERNUS	1	3	1	4	0	0
HEXAGENIA BILINEATA	6	0	0	0	0	0
HYALELLA AZTECA	1	0	0	0	0	0
OLIGOCHAETA	8	0	0	0	0	0
ORCONECTES SP.	0	0	0	0	0	2
PARACHIRONOMUS SP.	1	5	0	7	10	10
STENACRON SP.	0	1	1	2	3	0

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE					
	496.5	506.6	518.0	527.4	528.0	529.5
			OCT 1983			
ARGIA SP.	0	0	1	0	-	1
CAENIS SP.	0	1	0	0	-	0
CAMBARUS SP..	0	0	1	0	-	0
CHAOBORUS SP.	1	0	0	0	-	1
CHEUMATOPSYCHE SP.	0	0	1	5	-	132
CHIRONOMIDAE	0	0	0	1	-	10
COELOTANYPUS SP.	2	1	0	0	-	0
CYRNELLUS FRATERNUS	1	1	63	64	-	221
FERRISSIA SP.	0	0	0	0	-	1
CRANGONYX SP.	0	0	0	1	-	0
GLYPTOTENDIPES SP.	0	0	0	1	-	3
HEXAGENIA BILINEATA	1	1	0	0	-	0
HIRUDINEA	0	1	1	1	-	0
HYALELLA AZTECA	0	0	1	0	-	0
HYDROPSYCHE SP.	0	0	1	1	-	170
NEMATA	0	0	0	1	-	0
OECETIS SP.	0	0	0	1	-	0
OLIGOCHAETA	2	2	0	0	-	0
ORCONECTES SP.	0	1	1	2	-	1
PHYSA SP.	0	0	1	0	-	1
PLANARIIDAE	3	1	8	10	-	13
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	-	1
PROCLADIUS SP.	1	0	0	0	-	0
SIALIS SP.	2	0	0	0	-	0
STENACRON SP.	1	6	22	109	-	1

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JAN 1984						MAY 1984					
ABLABESMYIA SP.	0	0	0	0	0	0	-	-	0	0	0	-
ARGIA SP.	0	1	0	0	0	0	-	-	0	0	0	-
ASELLUS SP.	0	0	0	0	0	1	-	-	0	0	1	-
BIVALVIA	0	0	0	0	1	0	-	-	0	0	0	-
CAENIS SP.	5	1	0	1	0	1	-	-	0	0	0	-
CAMBARUS SP..	0	0	0	0	0	0	-	-	0	0	0	-
CHAOBORUS SP.	1	0	0	0	0	0	-	-	0	0	0	-
CHEUMATOPSYCHE SP.	0	0	0	0	1	4	-	-	0	0	0	-
CHIRONOMIDAE	1	1	1	1	1	2	-	-	0	0	1	-
CHIRONOMUS SP.	1	0	0	1	0	0	-	-	0	0	0	-
CLINOTANYPUS SP.	0	0	0	0	0	0	-	-	0	0	0	-
COELOTANYPUS SP.	2	1	0	0	0	0	-	-	0	0	0	-
CORBICULA MANILENSIS	0	1	0	0	0	0	-	-	0	0	1	-
CRANGONYX SP.	0	0	0	0	0	0	-	-	0	0	0	-
CURA FOREMANII	0	0	0	0	0	0	-	-	0	0	0	-
CYRNELLUS FRATERNUS	0	0	0	1	0	1	-	-	0	0	0	-
DICROTENDIPES SP.	1	0	0	0	0	1	-	-	0	0	0	-
DIDYMOPS SP.	0	0	0	0	0	0	-	-	0	1	0	-
DROMOGOMPHUS SP.	0	0	0	0	0	0	-	-	0	0	0	-
DUGESIA TIGRINA	0	0	0	0	0	0	-	-	0	0	0	-
ENALLAGMA SP.	1	1	0	0	0	0	-	-	0	0	1	-
EPITHECA SP.	1	0	0	0	0	0	-	-	0	0	0	-
ERPOBDELLIDAE	0	0	0	0	0	0	-	-	0	0	0	-
GLOSSIPHONIIDAE	0	1	0	0	0	0	-	-	0	0	0	-
GLYPTOTENDIPES SP.	0	0	0	0	1	0	-	-	0	0	0	-
GOMPHUS SP.	1	0	0	0	0	0	-	-	0	0	0	-
GYRAULUS SP.	0	1	1	0	0	0	-	-	1	0	0	-
HEXAGENIA BILINEATA	1	1	0	0	0	0	-	-	0	0	0	-
HYALELLA AZTECA	7	6	0	1	0	1	-	-	0	0	0	-
HYDRA AMERICANA	0	0	0	0	0	0	-	-	1	1	1	-
HYDROPSYCHE SP.	0	0	0	0	0	0	-	-	0	0	1	-

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JAN 1984						MAY 1984					
HYDROPTILA SP.	1	0	0	0	0	0	-	-	0	0	0	-
ISCHNURA SP.	1	3	0	0	0	0	-	-	0	0	0	-
NAIDIDAE	0	1	0	0	0	0	-	-	0	0	0	-
NEUROCORDULIA SP.	1	0	0	0	0	0	-	-	0	0	0	-
NEUROCORDULIA YAMASKANENSIS	0	0	0	0	0	0	-	-	0	0	0	-
OECETIS SP.	1	0	0	0	0	0	-	-	0	0	0	-
OLIGOCHAETA	3	4	0	0	0	0	-	-	0	0	0	-
ORCONECTES SP.	0	0	1	0	1	1	-	-	1	1	1	-
PARACHIRONOMUS SP.	0	0	0	0	0	0	-	-	0	0	0	-
PHYSA SP.	0	3	1	0	0	0	-	-	0	0	0	-
PLANARIIDAE	39	5	1	0	1	1	-	-	3	16	8	-
PLEUROCERA (SYN. OXYTREMA) SP.	0	0	0	0	0	0	-	-	0	0	0	-
POLYCENTROPUS SP.	0	0	0	0	0	0	-	-	0	0	0	-
PROCLADIUS SP.	2	1	0	0	0	0	-	-	0	0	0	-
SIALIS SP.	1	0	0	0	0	0	-	-	0	0	0	-
SPHAERIUM SP.	0	0	0	0	0	0	-	-	0	0	0	-
STENACRON SP.	1	0	2	1	1	0	-	-	0	0	1	-
TRICORYTHODES SP.	0	0	0	0	0	0	-	-	0	0	0	-

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1984						DEC 1984					
ABLABESMYIA SP.	0	1	0	0	0	-	0	0	0	0	0	0
ARGIA SP.	0	2	0	0	0	-	0	2	0	0	3	0
ASELLUS SP.	0	1	1	1	1	-	0	0	1	0	6	0
BIVALVIA	0	0	0	0	0	-	0	0	0	0	0	0
CAENIS SP.	0	0	0	0	1	-	1	0	0	0	0	0
CAMBARUS SP..	0	0	0	0	0	-	0	0	1	0	0	0
CHAOBORUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	1	2	16	25	-	0	1	12	14	14	98
CHIRONOMIDAE	0	1	3	16	20	-	0	0	1	4	2	4
CHIRONOMUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
CLINOTANYPUS SP.	0	1	0	0	0	-	0	0	0	0	0	0
COELOTANYPUS SP.	1	0	0	0	0	-	2	3	0	0	0	0
CORBICULA MANILENSIS	1	0	0	0	1	-	1	1	0	0	2	1
CRANGONYX SP.	1	0	1	0	1	-	1	0	5	0	5	1
CURA FOREMANII	0	0	0	0	0	-	0	0	0	0	0	1
CYRNELLUS FRATERNUS	3	37	22	160	171	-	2	15	40	154	121	119
DICROTENDIPES SP.	0	0	4	3	0	-	0	0	0	0	0	0
DIDYMOPS SP.	0	0	0	0	0	-	0	0	0	0	0	0
DROMOGOMPHUS SP.	0	0	0	0	0	-	1	0	0	0	0	0
DUGESIA TIGRINA	0	3	26	1	12	-	1	1	42	9	20	37
ENALLAGMA SP.	0	0	0	0	0	-	0	0	0	0	0	0
EPITHECA SP.	0	0	0	0	0	-	0	0	0	0	0	0
ERPOBDELLIDAE	0	1	1	0	0	-	0	1	2	0	0	1
GLOSSIPHONIIDAE	0	0	1	0	0	-	0	0	0	0	0	0
GLYPTOTENDIPES SP.	1	1	1	3	9	-	0	1	1	2	2	8
GOMPHUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
GYRAULUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
HEXAGENIA BILINEATA	0	1	0	0	0	-	1	1	0	0	0	0
HYALELLA AZTECA	0	0	0	0	0	-	0	0	0	0	0	0
HYDRA AMERICANA	0	1	0	0	0	-	0	0	1	0	0	0
HYDROPSYCHE SP.	1	1	3	60	23	-	0	0	1	1	2	67

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	SEP 1984						DEC 1984					
HYDROPTILA SP.	0	0	0	0	0	-	0	0	0	0	0	0
ISCHNURA SP.	0	0	0	0	0	-	0	0	0	0	0	0
NAIDIDAE	0	0	0	0	0	-	0	0	0	0	0	0
NEUROCORDULIA SP.	0	0	0	0	0	-	0	0	0	0	0	0
NEUROCORDULIA YAMASKANENSIS	0	0	0	0	1	-	0	0	0	0	0	0
OECETIS SP.	0	0	0	0	0	-	1	0	0	0	0	0
OLIGOCHAETA	6	4	0	0	0	-	3	2	0	0	0	0
ORCONECTES SP.	0	1	2	1	2	-	0	0	2	2	4	1
PARACHIRONOMUS SP.	1	2	1	0	3	-	0	0	0	0	1	1
PHYSA SP.	0	0	0	0	0	-	1	0	0	0	0	0
PLANARIIDAE	0	0	0	0	0	-	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	0	0	-	0	1	0	0	0	0
POLYCENTROPUS SP.	0	0	0	0	0	-	0	1	0	0	0	0
PROCLADIUS SP.	0	0	0	0	0	-	0	0	0	0	0	0
SIALIS SP.	4	1	0	0	0	-	4	1	0	0	0	0
SPHAERIUM SP.	0	0	0	0	0	-	1	0	0	0	0	0
STENACRON SP.	1	19	35	13	55	-	1	9	77	36	111	8
TRICORYTHODES SP.	0	0	1	0	0	-	0	0	0	0	0	0

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JAN 1985						APR 1985					
ABLABESMYIA SP.	0	0	0	-	0	0	1	0	0	0	0	0
AMNICOLA SP.	0	0	0	-	0	0	0	0	0	0	1	0
ARGIA SP.	0	1	0	-	0	0	0	1	0	0	0	0
ASELLUS SP.	0	0	0	-	0	0	1	0	0	1	0	0
CAENIS SP.	0	1	0	-	0	0	2	0	0	0	0	0
CAMBARUS SP..	0	0	0	-	0	0	0	0	0	0	0	0
CAMPELOMA SP.	0	0	0	-	0	0	1	0	0	0	0	0
CHEUMATOPSYCHE SP.	0	0	1	-	2	4	1	0	1	0	0	0
CHIRONOMIDAE	3	4	3	-	1	0	0	0	1	1	0	1
CHIRONOMUS SP.	0	0	0	-	0	0	1	0	0	0	0	0
COELOTANYPUS SP.	2	3	0	-	0	0	1	3	1	0	0	0
CORBICULA MANILENSIS	0	1	0	-	0	0	0	1	1	1	0	1
CRANGONYX SP.	0	1	0	-	0	0	0	0	0	0	0	1
CRYPTOCHIRONOMUS SP.	0	0	0	-	0	0	0	0	0	0	0	0
CURA FOREMANII	0	0	0	-	0	0	0	0	0	1	1	0
CYRNELLUS FRATERNUS	0	0	0	-	1	0	0	0	1	0	1	0
DECAPODA	0	0	0	-	0	0	0	0	0	0	0	0
DICROTENDIPES SP.	0	1	0	-	1	1	0	0	0	0	0	1
DUGESIA TIGRINA	26	1	1	-	0	3	7	0	0	0	0	0
ENALLAGMA SP.	1	1	0	-	0	0	1	0	0	0	0	0
EPITHECA SP.	0	0	0	-	0	0	1	1	0	0	0	0
ERPOBDELLIDAE	0	0	0	-	0	0	0	0	0	1	1	0
FERRISSIA SP.	0	0	0	-	0	0	0	0	0	1	0	0
GAMMARUS SP.	0	1	0	-	0	0	0	0	0	0	0	0
GLYPTOTENDIPES SP.	0	0	0	-	0	0	0	0	0	0	0	1
GOMPHUS SP.	0	0	0	-	0	0	0	1	0	0	0	0
GYRAULUS SP.	0	0	0	-	0	0	0	0	0	0	0	0
HEXAGENIA BILINEATA	3	1	0	-	0	0	6	1	0	0	0	0
HIRUDINEA	0	1	1	-	0	0	0	0	0	0	0	0
HYALELLA AZTECA	1	0	1	-	0	0	0	0	0	0	0	0
HYDRA SP.	0	0	0	-	0	0	0	0	1	1	1	1

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JAN 1985						APR 1985					
HYDROPSYCHE SP.	0	0	1	-	1	0	0	0	0	0	0	0
HYDROPTILA SP.	1	1	0	-	0	0	0	0	0	0	0	0
LIRCEUS SP.	0	1	0	-	0	0	0	0	0	0	0	0
NAIDIDAE	0	0	0	-	0	0	1	0	0	1	0	0
OECETIS SP.	0	0	0	-	0	0	0	0	0	0	0	0
OLIGOCHAETA	2	2	0	-	0	0	9	4	0	1	0	0
ORCONECTES SP.	0	0	1	-	1	0	0	0	1	1	1	1
PARACHIRONOMUS SP.	0	0	0	-	0	0	1	0	0	0	0	0
PECTINATELLA MAGNIFICA	0	0	0	-	0	0	0	0	0	0	0	0
PHYSA SP.	0	0	0	-	0	0	1	0	1	0	1	1
PLANARIIDAE	0	0	0	-	0	0	0	0	4	29	24	36
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	0	-	0	0	0	2	0	0	0	0
PROCLADIUS SP.	1	1	0	-	0	0	1	0	0	0	0	0
SIALIS SP.	1	1	0	-	0	0	0	1	0	0	0	0
STENACRON SP.	0	0	1	-	0	0	0	2	1	0	0	1
STENOCHIRONOMUS SP.	0	1	0	-	0	0	0	0	0	0	0	0
TANYPUS SP.	0	0	0	-	0	0	0	0	0	0	0	0

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JUL 1985						NOV 1985					
ABLABESMYIA SP.	1	0	0	0	0	0	0	0	1	0	0	-
AMNICOLA SP.	1	0	0	0	0	0	0	0	0	0	0	-
ARGIA SP.	0	0	0	0	0	0	0	0	0	1	0	-
ASELLUS SP.	0	0	1	1	0	1	0	0	1	0	0	-
CAENIS SP.	0	0	0	0	0	0	0	0	0	0	0	-
CAMBARUS SP..	0	0	0	0	0	0	0	0	1	0	1	-
CAMPELOMA SP.	0	0	0	0	0	0	0	0	0	0	0	-
CHEUMATOPSYCHE SP.	0	0	0	0	0	0	0	0	0	0	0	-
CHIRONOMIDAE	0	1	0	4	3	3	0	0	1	0	1	-
CHIRONOMUS SP.	0	0	0	0	0	0	0	0	0	0	0	-
COELOTANYPUS SP.	0	1	0	0	0	0	1	0	0	0	0	-
CORBICULA MANILENSIS	1	1	0	0	0	0	1	1	0	0	0	-
CRANGONYX SP.	0	1	2	2	1	1	0	0	1	0	0	-
CRYPTOCHIRONOMUS SP.	0	0	1	0	0	0	0	0	0	0	0	-
CURA FOREMANII	0	0	0	0	0	0	0	0	0	0	0	-
CYRNELLUS FRATERNUS	8	4	7	31	33	6	3	5	11	50	67	-
DECAPODA	0	0	1	1	0	0	0	0	0	0	0	-
DICROTENDIPES SP.	1	0	17	29	24	38	0	0	1	3	4	-
DUGESIA TIGRINA	0	0	0	0	0	0	0	0	0	0	0	-
ENALLAGMA SP.	0	0	0	0	0	0	0	0	0	0	0	-
EPITHECA SP.	0	0	0	0	0	0	0	0	0	0	0	-
ERPOBDELLIDAE	0	0	0	0	0	0	0	0	0	0	0	-
FERRISSIA SP.	0	0	0	0	0	0	0	0	0	0	0	-
GAMMARUS SP.	2	1	1	1	0	0	0	2	0	1	1	-
GLYPTOTENDIPES SP.	0	0	1	8	9	6	0	0	0	2	3	-
GOMPHUS SP.	0	0	0	0	0	0	0	0	0	0	0	-
GYRAULUS SP.	1	0	0	0	0	0	0	0	0	0	0	-
HEXAGENIA BILINEATA	1	1	0	0	0	0	0	0	0	0	0	-
HIRUDINEA	0	0	1	0	1	1	0	0	1	0	1	-
HYALELLA AZTECA	0	0	0	0	0	0	0	0	0	0	0	-
HYDRA SP.	0	0	1	1	1	1	0	1	1	1	1	-

Appendix 7-C (Continued)

	TENNESSEE RIVER MILE											
	496.5	506.6	518.0	527.4	528.0	529.5	496.5	506.6	518.0	527.4	528.0	529.5
	JUL 1985						NOV 1985					
HYDROPSYCHE SP.	0	0	0	0	0	0	0	0	0	0	0	–
HYDROPTILA SP.	0	0	0	0	0	0	0	0	0	0	0	–
LIRCEUS SP.	0	0	0	0	0	0	0	0	0	0	0	–
NAIDIDAE	0	0	0	0	0	0	0	0	0	0	0	–
OECETIS SP.	0	0	0	0	0	1	0	0	0	0	0	–
OLIGOCHAETA	5	4	0	1	0	0	3	2	0	0	0	–
ORCONECTES SP.	0	1	1	1	0	1	0	1	1	1	1	–
PARACHIRONOMUS SP.	0	1	3	5	6	10	0	0	0	0	1	–
PECTINATELLA MAGNIFICA	1	0	0	0	0	0	0	0	0	0	0	–
PHYSA SP.	0	0	1	1	1	0	0	0	0	0	0	–
PLANARIIDAE	6	0	17	15	26	8	4	3	5	8	9	–
PLEUROCERA (SYN. OXYTREMA) SP.	0	1	1	0	0	1	1	2	0	0	1	–
PROCLADIUS SP.	0	1	0	0	0	0	0	0	1	0	0	–
SIALIS SP.	1	1	0	0	0	0	2	1	0	0	0	–
STENACRON SP.	4	3	2	1	6	1	1	4	7	3	13	–
STENOCHIRONOMUS SP.	0	0	0	0	0	0	0	0	0	0	0	–
TANYPUS SP.	0	0	0	0	0	1	0	0	0	0	0	–?

*Samples not retrieved.

APPENDIX 7-D

AVERAGE ABUNDANCE (NO./M^2) OF BENTHIC MACROINVERTEBRATES COLLECTED NEAR WATTS BAR NUCLEAR PLANT, SUMMER AND FALL 1983 THROUGH 1985 (HESS SAMPLER COLLECTION)

Appendix 7-D. Average Abundance (No./m^2) of Benthic Macroinvertebrates Collected Near Watts Bar Nuclear Plant, Summer and Fall 1983 through 1985 (Hess Sampler Collection).

	TENNESSEE RIVER MILE									
	521.0	526.3	527.4	528.0	528.8	521.0	526.3	527.4	528.0	528.5
	JUL 1983					OCT 1983				
ASELLUS SP.	0	0	2	6	1	0	0	0	11	22
BRANCHIURA SOWERBYI	1	1	13	12	26	0	5	1	0	2
CHEUMATOPSYCHE SP.	1	0	2	0	6	0	0	0	1	0
CHIRONOMIDAE	6	1	5	1	4	2	0	0	0	1
CHIRONOMUS SP.	0	0	0	0	1	0	0	0	0	0
CORBICULA MANILENSIS	709	708	338	641	859	750	696	688	587	509
CYCLONAIAS TUBERCULATA	0	0	0	0	0	0	1	0	0	0
CYRNELLUS FRATERNUS	23	11	91	148	122	56	44	89	127	130
DICROTENDIPES SP.	0	0	2	1	0	4	0	1	1	0
DUGESIA TIGRINA	0	0	0	0	0	0	0	1	0	1
ELLIPTIO CRASSIDENS	0	0	0	1	0	2	6	0	1	0
ENALLAGMA SP.	0	0	0	0	0	0	1	0	0	0
GAMMARUS SP.	5	0	10	19	13	8	10	10	104	49
GLYPTOTENDIPES SP.	0	0	1	0	7	0	2	1	0	0
GOMPHUS SP.	1	0	0	0	0	0	0	0	0	0
HIRUDINEA	6	2	8	2	11	13	5	2	4	7
ISCHNURA SP.	0	0	0	0	0	0	0	1	0	0
LIRCEUS SP.	0	0	0	0	0	0	0	0	0	1
OBLIQUARIA REFLEXA	0	0	0	0	0	0	0	1	0	0
OLIGOCHAETA	29	64	26	19	24	41	52	37	30	29
ORCONECTES SP.	0	0	1	4	0	0	1	0	0	1
PHYSA SP.	2	0	2	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	0	0	0	0	0	0	1	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	7	1	0	0	2	2	0	0	0	0
QUADRULA POSTULOSA	0	1	0	0	0	1	0	0	0	0
STENACRON SP.	2	0	10	8	2	0	1	1	0	0
TRICORYTHODES SP.	0	0	0	0	2	0	0	0	0	0

Appendix 7-D (Continued)

	TENNESSEE RIVER MILE									
	521.0	526.3	527.4	528.0	528.5	521.0	526.3	527.4	528.0	528.5
	JUL 1984					OCT 1984				
ABLABESMYIA SP.	0	0	0	1	0	0	0	0	0	0
AMBLEMA SP.	0	0	0	0	0	0	0	1	0	0
ANODONTA IMBECILLIS	0	1	0	0	0	0	0	0	0	0
ASELLUS SP.	0	0	8	32	26	0	0	1	40	20
BRANCHIURA SOWERBYI	2	16	4	5	10	1	5	8	2	6
CAENIS SP.	0	0	0	1	0	0	0	0	0	0
CERACLEA SP.	0	0	0	1	0	0	0	0	0	0
CHAOBORUS SP.	4	0	0	0	0	0	0	1	1	0
CHEUMATOPSYCHE SP.	1	0	1	0	0	82	10	14	77	100
CHIRONOMIDAE	1	1	0	7	1	2	0	8	12	8
COENAGRIONIDAE	0	0	0	0	0	0	0	0	0	1
CORBICULA MANILENSIS	661	1081	1066	538	1054	586	786	832	457	582
CRANGONYX SP.	2	2	30	16	13	18	7	36	233	112
CRYPTOCHIRONOMUS SP.	0	4	0	0	0	0	0	0	0	0
CYRNELLUS FRATERNUS	0	7	0	2	7	78	192	408	854	749
DICROTENDIPES SP.	7	7	7	1	4	2	17	0	1	1
DUGESIA TIGRINA	1	1	0	0	2	0	1	0	2	1
ELLIPTIO CRASSIDENS	11	0	4	1	1	6	4	0	1	0
ERPOBDELLIDAE	1	2	12	8	5	49	31	26	32	31
GLOSSIPHONIIDAE	0	0	0	0	0	0	0	2	0	0
GLYPTOTENDIPES SP.	1	2	2	6	2	0	0	0	5	0
HIRUDINEA	0	0	0	0	1	0	0	0	0	2
HYDRACHNIDAE	1	0	0	0	0	0	0	0	0	0
HYDROPSYCHE SP.	0	0	0	0	1	1	0	1	0	1
LIMNODRILUS SP.	1	0	0	0	0	0	14	0	0	0
LIRCEUS SP.	0	0	0	1	0	0	0	0	0	0
MACRONYCHUS SP.	0	1	0	0	0	0	0	0	0	0
NAIDIDAE	0	1	0	0	0	0	0	0	0	0
OBLIQUARIA REFLEXA	0	1	0	0	0	0	0	1	0	0
OLIGOCHAETA	10	6	20	12	16	32	22	28	8	14
ORCONECTES SP.	0	0	0	2	0	0	0	0	1	1

Appendix 7-D (Continued)

	TENNESSEE RIVER MILE									
	521.0	526.3	527.4	528.0	528.5	521.0	526.3	527.4	528.0	528.5
	JUL 1984					OCT 1984				
PARACHIRONOMUS SP.	2	1	6	4	2	2	0	0	6	14
PHYSA SP.	0	0	1	0	0	0	0	1	0	0
PLANARIIDAE	0	0	5	0	0	0	0	0	1	0
PLEUROBEMA CORDATUM	0	0	0	0	0	1	0	0	0	0
PLEUROBEMA CORDATUM PYRAMIDATUM	5	0	0	0	0	0	0	0	0	0
PLEUROCERA (SYN. OXYTREMA) SP.	22	1	0	0	0	24	0	0	0	2
QUADRULA POSTULOSA	0	0	0	0	0	5	1	0	0	0
QUADRULA SP.	4	1	2	0	0	0	0	0	0	0
SPHAERIUM SP.	0	5	0	0	0	0	0	0	1	0
STENACRON SP.	0	0	0	0	0	0	2	2	1	0
TRICORYTHODES SP.	0	0	0	0	1	0	0	0	0	0
TUBIFICIDAE	28	29	25	14	14	11	38	19	17	6

Appendix 7-D (Continued)

	TENNESSEE RIVER MILE									
	521.0	526.3	527.4	528.0	528.5	521.0	526.3	527.4	528.0	528.5
	JUL 1985					OCT 1985				
AMNICOLA SP.	0	0	0	1	0	0	0	0	0	0
ASELLUS SP.	0	0	4	20	25	0	0	1	14	10
BRANCHIURA SOWERBYI	18	145	41	13	26	20	52	48	0	12
CAMPELOMA SP.	0	0	0	1	0	0	0	0	0	0
CERACLEA SP.	0	0	0	1	0	0	0	0	0	0
CHAOBORUS SP.	0	0	0	0	0	4	0	0	0	0
CHIRONOMIDAE	11	65	5	12	13	2	0	5	0	16
CHIRONOMUS SP.	16	540	17	0	0	0	0	0	0	0
COELOTANYPUS SP.	0	0	0	0	0	1	0	0	0	0
CONCHAPELOPIA SP.	0	2	0	0	0	0	0	0	0	0
CORBICULA MANILENSIS	674	914	444	479	478	586	631	509	485	444
CRANGONYX SP.	22	1	17	53	28	23	2	5	6	2
CRYPTOCHIRONOMUS SP.	2	8	0	0	0	0	2	0	0	0
CYRNELLUS FRATERNUS	14	25	4	10	36	44	82	161	296	368
DICROTENDIPES SP.	59	78	61	94	86	2	11	29	0	36
DROMOGOMPHUS SP.	2	0	0	0	0	0	0	0	0	0
DUGESIA TIGRINA	0	0	0	0	0	14	37	142	0	40
ELLIPTIO CRASSIDENS	4	0	0	1	0	5	2	0	1	0
EPOICOCLADIUS SP.	0	0	0	0	0	0	0	0	1	0
ERPOBDELLIDAE	0	1	4	34	0	26	12	4	0	77
FUSCONAIA EBENA	0	0	0	0	0	0	1	0	0	0
GAMMARUS SP.	37	1	1	0	0	59	0	0	0	0
GLOSSIPHONIIDAE	0	0	0	0	0	1	0	4	0	0
GLYPTOTENDIPES SP.	2	1	0	0	0	0	8	16	32	5
GYRAULUS SP.	0	0	0	1	0	0	0	0	0	0
HEXAGENIA BILINEATA	0	6	0	0	0	0	0	0	0	0
HIRUDINEA	6	0	0	0	18	0	0	0	98	0
NAIDIDAE	0	0	0	4	0	0	0	0	0	0
OLIGOCHAETA	35	0	47	19	12	17	24	18	10	10
ORCONECTES SP.	2	0	0	2	0	0	0	0	0	1
PARACHIRONOMUS SP.	8	6	5	0	0	19	2	2	5	5

Appendix 7-D (Continued)

	TENNESSEE RIVER MILE									
	521.0	526.3	527.4	528.0	528.5	521.0	526.3	527.4	528.0	528.5
	JUL 1985					OCT 1985				
PHYSA SP.	5	0	0	1	0	0	0	0	0	0
PLAGIOLA LINEOLATA	1	0	0	0	0	0	1	0	0	0
PLANARIIDAE	0	0	0	0	2	0	0	0	62	0
PLEUROCERA (SYN. OXYTREMA) SP.	61	0	0	0	1	34	2	0	0	0
PROCLADIUS SP.	2	6	0	0	0	0	0	0	0	0
QUADRULA POSTULOSA	1	2	0	0	0	0	0	0	2	0
SIALIS SP.	1	1	0	0	0	1	0	0	0	0
SPHAERIUM SP.	2	1	0	0	0	0	0	0	0	0
TUBIFICIDAE	14	82	19	48	55	8	70	24	1	14

APPENDIX 7-E

BENTHIC SEDIMENT COMPOSITION BY WEIGHT (GRAMS),
WATTS BAR NUCLEAR PLANT,
SUMMER AND AUTUMN 1983 THROUGH 1985

Appendix 7-E. Benthic Sediment Composition by Weight (Grams), Watts Bar Nuclear Plant, Summer and Autumn 1983 through 1985.

Season	Station (TRM)	Replicate	Particle Size (mm)* <.063	.063-0.25	0.25-0.5	0.5-2.0	2.0-31	31-63
Summer 1983	521.0	A	0.9	22.9	95.3	746.4	442.4	0
		B	0.9	37.3	249.0	402.9	428.8	169.1
		C	0.7	12.7	109.0	192.5	479.0	0
		x̄	0.8	24.3	151.1	447.3	450.1	56.4
	526.3	A	0.8	175.5	172.2	53.9	310.8	0
		B	0.8	130.6	102.2	77.2	368.0	135.2
		C	0.4	124.8	101.2	77.8	417.9	426.4
		x̄	0.7	143.6	125.2	69.6	365.6	187.2
	527.4	A	0	4.6	14.6	70.3	907.3	475.3
		B	0	4.6	19.9	67.8	266.7	450.5
		C	0.5	9.9	26.1	39.9	1013.5	157.1
		x̄	0.2	6.4	20.2	59.3	729.2	359.0
	528.0	A	0.2	11.0	29.7	78.9	521.7	273.3
		B	0.8	17.6	53.1	235.8	1159.4	103.6
		C	1.2	32.4	22.9	28.8	780.4	0
		x̄	0.7	20.3	35.3	114.5	820.5	125.6
	528.8	A	0	0	0.5	1.0	571.7	223.8
		B	0.5	32.0	39.0	42.7	660.6	0
		C	0.5	9.8	30.4	54.6	671.0	282.5
		x̄	0.3	13.9	23.3	32.8	634.4	168.8

Appendix 7-E (Continued)

Season	Station (TRM)	Replicate	Particle Size (mm)* <.063	.063-0.25	0.25-0.5	0.5-2.0	2.0-31	31-63
Fall 1983	521.0	A	0.6	5.9	31.5	248.5	529.9	0
		B	0.2	3.0	12.5	115.2	528.6	316.3
		C	0.1	2.7	20.5	172.1	354.4	0
		$\bar{x}$	0.3	3.9	21.5	178.6	471.0	105.4
	526.3	A	1.9	155.9	36.1	11.9	293.4	0
		B	0.9	157.2	51.0	34.0	333.6	0
		C	1.0	211.9	106.0	51.8	479.8	180.1
		$\bar{x}$	1.3	175.0	64.4	32.6	368.9	60.0
	527.4	A	0.3	17.9	59.4	89.9	699.7	140.2
		B	0.4	13.5	41.1	65.1	1068.5	73.5
		C	0 4	24.0	61.4	85.0	1306.1	193.3
		$\bar{x}$	0.4	18.5	54.0	80.0	1024.8	135.7
	528.0	A	0.3	15.0	74.8	201.9	389.2	0
		B	0.2	10.2	53.0	227.4	364.8	0
		C	0.2	10.9	56.4	220.0	406.6	0
		$\bar{x}$	0.2	12.0	61.4	216.4	386.9	0
	528.5	A	0.5	11.2	47.0	145.4	934.8	0
		B	0.5	8.5	31.9	88.0	1151.9	0
		C	0.5	8.3	28.2	89.6	956.3	171.2
		$\bar{x}$	0.5	9.3	35.7	107.7	1014.3	57.1

Appendix 7-E (Continued)

Season	Station (TRM)	Replicate	Particle Size (mm)* <.063	.063-0.25	0.25-0.5	0.5-2.0	2.0-31	31-63
Summer 1984	521.0	A	0.6	6.75	48.74	601.99	437.73	0
		B	1.2	48.36	83.37	558.49	932.22	165.8
		C	0.5	26.38	31.29	328.33	663.78	0
		$\bar{x}$	0.8	27.16	54.47	496.27	677.91	55.28
	526.3	A	2.0	222.81	76.98	49.95	334.69	0
		B	0.8	20.99	31.37	67.28	640.48	0
		C	2.0	278.14	86.27	11.54	349.22	0
		$\bar{x}$	1.6	173.95	64.87	42.92	441.46	0
	527.4	A	0.3	10.87	18.78	380.89	646.92	0
		B	0.2	1.85	6.39	22.01	706.67	0
		C	0.1	1.51	1.06	3.34	599.66	0
		$\bar{x}$	0.2	4.74	8.74	135.41	651.08	0
	528.0	A	0.2	2.48	38.77	47.22	649.66	0
		B	5.2	1.85	6.39	22.01	706.67	0
		C	0.3	4.23	23.07	91.02	544.66	0
		$\bar{x}$	1.9	2.85	22.74	53.42	633.66	0
	528.5	A	0.1	2.25	17.96	78.84	718.47	0
		B	41.4	135.43	160.16	275.39	769.23	0
		C	0.1	0.60	0.80	1.57	657.17	0
		$\bar{x}$	13.9	46.09	59.64	118.60	714.96	0

Fall 1984 Samples were lost by the Laboratory.

Appendix 7-E (Continued)

Season	Station (TRM)	Replicate	Particle Size (mm)* <.063	.063-0.25	0.25-0.5	0.5-2.0	2.0-31	31-63
Summer 1985	521.0	A	3.9	99.97	68.66	460.97	652.71	0
		B	0.7	37.48	24.75	182.60	393.73	45.49
		C	0.5	9.74	7.84	80.95	395.86	0
		$\bar{x}$	1.7	49.06	33.75	241.51	480.77	15.16
	526.3	A	36.0	483.11	78.13	34.69	446.96	0
		B	2.2	87.22	54.86	164.32	627.54	0
		C	17.2	574.08	91.41	40.05	431.69	363.70
		$\bar{x}$	18.5	381.47	74.80	79.69	502.06	121.23
	527.4	A	0.1	3.34	20.68	46.82	264.40	0
		B	0.4	10.80	86.61	84.75	494.03	0
		C	0.2	12.52	64.95	86.17	512.74	0
		$\bar{x}$	0.2	8.89	57.41	72.58	423.72	0
	528.0	A	0.1	1.58	12.07	104.48	583.64	0
		B	0.5	15.32	95.46	340.59	572.01	0
		C	0.1	1.58	3.09	9.89	375.80	0
		$\bar{x}$	0.2	6.16	36.87	151.65	510.48	0
	528.5	A	0.1	0.21	0.25	0.90	279.68	198.14
		B	0.4	10.25	52.94	155.26	309.75	0
		C	0.2	2.46	7.69	40.74	579.14	0
		$\bar{x}$	0.2	4.31	20.29	65.33	389.52	66.05

Appendix 7-E (Continued)

Season	Station (TRM)	Replicate	Particle Size (mm)* <.063	.063-0.25	0.25-0.5	0.5-2.0	2.0-31	31-63
Fall 1985	521.0	A	0.6	50.73	18.01	146.44	653.40	0
		B	0.0	0.05	0.00	1.98	237.28	0
		C	0.1	11.26	5.79	53.58	250.62	0
		$\bar{x}$	0.2	20.68	7.93	67.33	380.43	0
	526.3	A	3.0	17.05	47.39	23.04	611.30	0
		B	1.4	54.97	8.43	5.44	501.87	0
		C	0.1	4.20	1.72	19.47	299.78	0
		$\bar{x}$	1.5	25.41	19.18	15.98	470.98	0
	527.4	A	0.3	6.37	42.49	57.63	878.19	49.69
		B	0.1	0.41	2.07	5.52	275.06	248.58
		C	0.0	5.86	34.83	45.46	615.35	0
		$\bar{x}$	0.1	4.21	26.46	36.20	589.53	99.42
	528.0	A	0.6	16.48	92.00	416.93	692.63	0
		B	0.1	3.78	6.78	19.04	46.88	0
		C	1.1	16.84	76.43	307.16	504.54	0
		$\bar{x}$	0.9	12.37	58.40	247.71	414.68	0
	528.5	A	0.1	3.78	6.78	19.04	46.88	0
		B	0.2	2.52	4.60	17.61	797.27	0
		C	0.2	1.03	1.95	11.95	705.64	144.85
		$\bar{x}$	0.2	2.44	4.44	16.20	516.60	48.28

*Particle description:
- .063 mm - silt and clay
- .063-.25 mm - very fine sand
- .25-0.5 mm - fine and medium sand
- 0.5-2.0 mm - coarse sand
- 2.0-31 mm - granule and pebble
- 31-63 mm - pebble

APPENDIX 7-F

NUMBERS OF EACH FRESHWATER MUSSEL SPECIES FOUND ALIVE DURING SAMPLING AT EACH STATION VISITED IN SUMMER AND FALL 1983, 1984, AND 1985

Appendix 7-F. Numbers of Each Freshwater Mussel Species Found Alive During Sampling at Each Station Visited in Summer and Fall 1983, 1984, and 1985.

YEAR = 1983	520.0		520.3		520.6		520.8		BED TOTAL	
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL
ACTINONAIAS LIGAMENTINA	1	1	0	0	0	0	0	0	1	1
AMBLEMA PLICATA	0	2	0	0	1	3	0	1	1	6
ANODONTA GRANDIS	0	0	0	0	0	0	0	0	0	0
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0
CYCLONAIAS TUBERCULATA	8	5	5	4	21	14	11	15	45	38
CYPROGENIA STEGARIA	0	0	0	0	1	0	0	0	1	0
DROMUS DROMAS	0	0	0	0	1	0	0	0	1	0
ELLIPTIO CRASSIDENS	163	0	71	145	78	100	102	102	414	347
ELLIPTIO DILATATUS	1	0	0	1	1	0	1	0	3	1
FUSCONAIA MACULATA	0	0	0	0	0	0	1	0	1	0
LAMPSILIS ORBICULATA	0	0	0	1	0	1	0	0	0	2
LAMPSILIS OVATA	1	0	0	1	1	0	0	0	2	1
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	0	0	0	1	0	1	0	2
LIGUMIA RECTA	1	0	1	1	0	0	1	0	3	1
MEGALONAIAS GIGANTEA	0	0	0	0	0	0	0	0	0	0
OBLIQUARIA REFLEXA	1	0	0	0	0	0	0	0	1	0
PLAGIOLA LINEOLATA	2	1	3	2	2	4	8	6	15	13
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	17	32	41	13	16	13	16	24	90	82
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA PLENUM	0	0	0	1	0	0	1	0	1	1
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	2	1	1	1	3	3	0	0	6	5
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	1	5	0	2	5	1	2	2	8	10
QUADRULA PUSTULOSA	8	6	3	0	6	6	15	10	32	22
TRITOGONIA VERRUCOSA	0	0	0	0	0	0	0	0	0	0
SPECIMEN TOTALS	206	53	125	172	136	146	158	161	625	532
NO. SPECIES	12	8	7	11	12	10	10	8	17	15

Appendix 7-F (Continued)

	YEAR = 1983									
	526.0		526.3		526.5		526.8		BED TOTAL	
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL
ACTINONAIAS LIGAMENTINA	0	0	1	0	0	0	0	0	1	0
AMBLEMA PLICATA	0	6	5	6	5	10	5	2	15	24
ANODONTA GRANDIS	4	4	1	0	3	1	6	3	14	8
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0
CYCLONAIAS TUBERCULATA	3	1	7	8	4	5	4	0	18	14
CYPROGENIA STEGARIA	0	0	0	0	0	0	0	0	0	0
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	21	21	65	52	12	26	34	72	132	171
ELLIPTIO DILATATUS	0	1	0	0	0	0	0	0	0	1
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	0	0	1	0	0	0	0	0	1	0
LAMPSILIS OVATA	0	0	0	0	0	0	0	0	0	0
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	1	0	0	0	0	0	0	0	1	0
LIGUMIA RECTA	0	0	0	1	0	0	1	0	1	1
MEGALONAIAS GIGANTEA	0	0	1	1	1	0	0	0	2	1
OBLIQUARIA REFLEXA	0	1	4	1	6	2	2	2	12	6
PLAGIOLA LINEOLATA	1	1	4	1	2	0	1	3	8	5
PLETHOBASUS CYPHYUS	0	2	0	0	0	0	0	0	0	2
PLEUROBEMA CORDATUM	17	9	82	24	7	22	3	2	109	57
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA PLENUM	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	3	7	0	0	1	6	3	7	7	20
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	2	1	0	2	2	0	0	0	4	3
QUADRULA PUSTULOSA	4	4	22	8	14	6	5	0	45	18
TRITOGONIA VERRUCOSA	2	7	1	0	0	2	2	3	5	12
SPECIMEN TOTALS	58	65	194	104	57	80	66	94	375	343
NO. SPECIES	10	13	12	10	11	9	11	8	16	15

Appendix 7-F (Continued)

	YEAR = 1983										
	528.2		528.5		528.8		528.9		BED TOTAL		GRAND
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	TOTAL
ACTINONAIAS LIGAMENTINA	0	0	1	0	0	0	0	1	1	1	5
AMBLEMA PLICATA	0	0	1	1	1	0	0	2	2	3	51
ANODONTA GRANDIS	0	0	0	1	1	1	3	0	4	2	28
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0	0
CYCLONAIAS TUBERCULATA	5	1	8	4	8	4	4	9	25	18	158
CYPROGENIA STEGARIA	0	1	0	0	1	0	0	0	1	1	3
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0	1
ELLIPTIO CRASSIDENS	53	54	43	108	69	91	43	65	208	318	1590
ELLIPTIO DILATATUS	0	0	0	0	0	0	1	0	1	0	6
FUSCONAIA MACULATA	0	0	0	0	1	0	0	0	1	0	2
LAMPSILIS ORBICULATA	0	1	1	1	1	1	0	2	2	5	10
LAMPSILIS OVATA	0	0	0	0	1	0	0	0	1	0	4
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	0	0	0	0	0	1	0	1	4
LIGUMIA RECTA	0	0	1	0	1	1	0	0	2	1	9
MEGALONAIAS GIGANTEA	0	0	0	0	0	0	0	0	0	0	3
OBLIQUARIA REFLEXA	0	0	1	0	0	0	0	0	1	0	20
PLAGIOLA LINEOLATA	0	1	1	7	0	0	0	3	1	11	53
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0	2
PLEUROBEMA CORDATUM	12	8	18	51	20	46	15	31	65	136	539
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA PLENUM	0	0	0	0	0	0	0	0	0	0	2
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	0	1	0	1	1	1	0	1	1	4	43
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	1	2	1	5	0	1	0	3	2	11	38
QUADRULA PUSTULOSA	6	12	5	7	9	1	2	15	22	35	174
TRITOGONIA VERRUCOSA	0	0	0	0	1	0	0	0	1	0	18
SPECIMEN TOTALS	77	81	81	186	115	147	68	133	341	547	2763
NO. SPECIES	5	9	11	10	13	9	6	11	18	14	23

Appendix 7-F (Continued)

	YEAR = 1984									
	520.0		520.3		520.6		520.8		BED TOTAL	
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL
ACTINONAIAS LIGAMENTINA	0	0	0	0	0	0	0	0	0	0
AMBLEMA PLICATA	0	0	0	1	4	0	0	1	4	2
ANODONTA GRANDIS	0	0	0	0	0	0	0	0	0	0
ANODONTA IMBECILLIS	0	0	0	0	0	1	0	0	0	1
CYCLONAIAS TUBERCULATA	0	2	4	11	33	20	25	10	62	43
CYPROGENIA STEGARIA	0	0	0	0	0	1	0	0	0	1
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	110	128	63	58	15	92	44	102	232	380
ELLIPTIO DILATATUS	0	0	0	1	0	0	0	0	0	1
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	0	0	1	0	0	0	0	0	1	0
LAMPSILIS OVATA	1	0	0	0	0	0	0	0	1	0
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	0	0	0	0	0	0	0	0
LIGUMIA RECTA	2	0	0	0	0	1	0	2	2	3
MEGALONAIAS GIGANTEA	0	0	0	0	0	0	0	0	0	0
OBLIQUARIA REFLEXA	0	0	0	0	1	0	0	0	1	0
PLAGIOLA LINEOLATA	1	0	2	1	7	6	3	3	13	10
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	33	12	27	13	24	25	23	20	107	70
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA PLENUM	0	0	0	0	2	0	0	0	2	0
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	0	1	2	0	3	2	2	4	7	7
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	1	0	0	0	1	0
QUADRULA METANEVRA	0	0	2	4	2	1	2	3	6	8
QUADRULA PUSTULOSA	4	3	0	7	13	7	10	9	27	26
TRITOGONIA VERRUCOSA	0	0	0	0	1	0	0	0	1	0
SPECIMEN TOTALS	151	146	101	96	106	156	109	154	467	552
NO. SPECIES	6	5	7	8	12	10	7	9	15	12

Appendix 7-F (Continued)

	YEAR = 1984									
	526.0		526.3		526.5		526.8		BED TOTAL	
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL
ACTINONAIAS LIGAMENTINA	0	0	0	0	0	0	0	0	0	0
AMBLEMA PLICATA	4	1	1	1	7	0	0	2	12	4
ANODONTA GRANDIS	1	2	2	0	2	0	0	1	5	3
ANODONTA IMBECILLIS	0	0	0	1	0	0	0	0	0	1
CYCLONAIAS TUBERCULATA	0	1	0	3	2	1	0	0	2	5
CYPROGENIA STEGARIA	0	0	0	0	0	0	0	0	0	0
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	9	41	33	60	21	36	18	67	81	204
ELLIPTIO DILATATUS	0	0	0	0	0	0	0	0	0	0
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	1	0	1	0	0	1	0	0	2	1
LAMPSILIS OVATA	0	0	0	0	0	1	0	0	0	1
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	1	1	0	0	2	1	3	2
LIGUMIA RECTA	0	0	0	0	0	0	0	0	0	0
MEGALONAIAS GIGANTEA	0	0	0	1	0	0	0	0	0	1
OBLIQUARIA REFLEXA	1	0	0	1	5	1	1	0	7	2
PLAGIOLA LINEOLATA	2	2	1	2	0	0	1	4	4	8
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	4	3	7	27	1	0	0	1	12	31
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA PLENUM	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	2	4	1	0	0	2	6	8	9	14
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	0	0	0	0	1	0	0	0	1	0
QUADRULA PUSTULOSA	8	0	2	7	6	1	4	1	20	9
TRITOGONIA VERRUCOSA	3	2	0	0	0	1	0	0	3	3
SPECIMEN TOTALS	35	56	49	104	45	44	32	85	161	289
NO. SPECIES	10	8	9	10	8	8	6	8	13	15

Appendix 7-F (Continued)

	YEAR = 1984										
	528.2		528.5		528.8		528.9		BED TOTAL		GRAND
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	TOTAL
ACTINONAIAS LIGAMENTINA	1	0	1	0	0	0	0	0	2	0	2
AMBLEMA PLICATA	1	2	1	0	1	2	0	1	3	5	30
ANODONTA GRANDIS	0	0	0	0	0	0	0	1	0	1	9
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0	2
CYCLONAIAS TUBERCULATA	0	1	3	0	6	11	0	2	9	14	135
CYPROGENIA STEGARIA	0	0	0	0	0	0	0	0	0	0	1
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	11	18	88	31	195	200	172	151	466	400	1763
ELLIPTIO DILATATUS	1	0	0	0	0	0	0	0	1	0	2
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	0	0	0	0	2	1	1	0	3	1	8
LAMPSILIS OVATA	0	0	0	3	0	0	0	0	0	3	5
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	1	0	0	0	0	0	1	0	6
LIGUMIA RECTA	0	0	0	5	2	1	0	1	2	7	14
MEGALONAIAS GIGANTEA	0	0	0	0	0	0	0	0	0	0	1
OBLIQUARIA REFLEXA	0	0	0	0	0	0	0	1	0	1	11
PLAGIOLA LINEOLATA	1	1	4	1	2	4	0	1	7	7	49
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	3	3	18	12	55	25	25	15	101	55	376
PLEUROBEMA OVIFORME	0	0	0	0	0	0	2	0	2	0	2
PLEUROBEMA PLENUM	0	0	0	0	0	0	0	0	0	0	2
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	0	3	1	4	1	1	0	0	2	8	47
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0	1
QUADRULA METANEVRA	0	1	2	0	2	4	0	0	4	5	24
QUADRULA PUSTULOSA	5	1	13	0	9	10	11	7	38	18	138
TRITOGONIA VERRUCOSA	0	1	1	1	0	0	0	0	1	2	10
SPECIMEN TOTALS	23	31	133	57	275	259	211	180	642	527	2638
NO. SPECIES	7	9	11	7	10	10	5	9	15	14	23

Appendix 7-F (Continued)

	YEAR = 1985									
	520.0		520.3		520.6		520.8		BED TOTAL	
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL
ACTINONAIAS LIGAMENTINA	0	2	0	0	0	2	1	0	1	4
AMBLEMA PLICATA	0	1	0	1	0	1	0	0	0	3
ANODONTA GRANDIS	0	0	0	0	0	0	0	0	0	0
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0
CYCLONAIAS TUBERCULATA	3	3	1	7	17	6	13	24	34	40
CYPROGENIA STEGARIA	0	0	0	0	1	0	0	0	1	0
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	39	79	41	128	35	73	88	47	203	327
ELLIPTIO DILATATUS	0	0	0	0	0	1	0	0	0	1
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	0	0	0	1	0	1	0	0	0	2
LAMPSILIS OVATA	1	0	0	0	0	0	0	0	1	0
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	0	0	0	0	0	0	0	0
LIGUMIA RECTA	0	0	0	1	0	2	0	1	0	4
MEGALONAIAS GIGANTEA	0	0	0	1	0	0	0	1	0	2
OBLIQUARIA REFLEXA	0	1	0	0	0	0	0	0	0	1
PLAGIOLA LINEOLATA	0	2	0	0	3	0	1	1	4	3
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	1	22	13	17	5	10	17	18	36	67
PLEUROBEMA OVIFORME	0	1	0	0	0	0	0	0	0	1
PLEUROBEMA PLENUM	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA RUBRUM	0	0	0	1	0	0	0	0	0	1
POTAMILUS ALATUS	0	1	0	1	0	5	3	5	3	12
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	1	0	1	0	2	1	2	4	6	5
QUADRULA PUSTULOSA	0	2	0	7	1	1	6	9	7	19
TRITOGONIA VERRUCOSA	0	0	0	0	0	0	0	1	0	1
SPECIMEN TOTALS	45	114	56	165	64	103	131	111	296	493
NO. SPECIES	5	10	4	10	7	11	8	10	10	17

Appendix 7-F (Continued)

	YEAR = 1985									
	526.0		526.3		526.5		526.8		BED TOTAL	
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL
ACTINONAIAS LIGAMENTINA	0	0	0	0	0	0	0	0	0	0
AMBLEMA PLICATA	0	2	2	1	7	3	0	5	9	11
ANODONTA GRANDIS	1	4	0	0	0	0	0	1	1	5
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0
CYCLONAIAS TUBERCULATA	0	0	5	2	1	1	1	1	7	4
CYPROGENIA STEGARIA	0	0	0	0	0	0	0	0	0	0
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	38	23	25	32	8	29	24	32	95	116
ELLIPTIO DILATATUS	0	0	0	1	0	0	0	0	0	1
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	0	0	0	0	0	0	0	0	0	0
LAMPSILIS OVATA	0	0	0	2	0	0	0	0	0	2
LASMIGONA COMPLANATA	0	0	0	0	0	0	0	0	0	0
LEPTODEA FRAGILIS	0	0	0	0	0	1	2	1	2	2
LIGUMIA RECTA	0	0	0	0	0	1	0	0	0	1
MEGALONAIAS GIGANTEA	0	0	1	0	0	0	0	0	1	0
OBLIQUARIA REFLEXA	0	1	2	0	4	1	0	0	6	2
PLAGIOLA LINEOLATA	0	2	2	4	0	2	0	3	2	11
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	2	2	18	26	2	3	1	9	23	40
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA PLENUM	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA RUBRUM	0	0	0	0	0	0	0	0	0	0
POTAMILUS ALATUS	3	7	0	3	5	14	17	0	25	24
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	0	2	0	1	0	0	0	0	0	3
QUADRULA PUSTULOSA	0	6	11	5	5	6	2	8	18	25
TRITOGONIA VERRUCOSA	2	8	0	1	2	2	0	2	4	13
SPECIMEN TOTALS	46	57	66	78	34	63	47	62	193	260
NO. SPECIES	5	10	8	11	8	11	6	9	12	15

Appendix 7-F (Continued)

	YEAR = 1985										
	528.2		528.5		528.8		528.9		BED TOTAL		GRAND
	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	SUMMER	FALL	TOTAL
ACTINONAIAS LIGAMENTINA	0	0	0	1	3	2	0	0	3	3	11
AMBLEMA PLICATA	2	0	0	3	5	5	1	3	8	11	42
ANODONTA GRANDIS	0	0	1	1	1	0	0	1	2	2	10
ANODONTA IMBECILLIS	0	0	0	0	0	0	0	0	0	0	0
CYCLONAIAS TUBERCULATA	0	2	5	9	11	10	3	1	19	22	126
CYPROGENIA STEGARIA	0	0	0	0	0	0	0	0	0	0	1
DROMUS DROMAS	0	0	0	0	0	0	0	0	0	0	0
ELLIPTIO CRASSIDENS	44	8	91	70	150	182	155	226	440	486	1667
ELLIPTIO DILATATUS	0	0	0	0	0	0	0	0	0	0	2
FUSCONAIA MACULATA	0	0	0	0	0	0	0	0	0	0	0
LAMPSILIS ORBICULATA	0	0	0	1	1	4	0	0	1	5	8
LAMPSILIS OVATA	2	0	0	0	2	2	0	0	4	2	9
LASMIGONA COMPLANATA	0	0	0	0	1	0	0	0	1	0	1
LEPTODEA FRAGILIS	0	0	0	0	1	0	0	0	1	0	5
LIGUMIA RECTA	1	0	1	0	1	2	0	1	3	3	11
MEGALONAIAS GIGANTEA	0	0	0	0	0	0	0	2	0	2	5
OBLIQUARIA REFLEXA	0	1	0	0	0	1	1	0	1	2	12
PLAGIOLA LINEOLATA	0	0	0	3	2	4	0	6	2	13	35
PLETHOBASUS CYPHYUS	0	0	0	0	0	0	0	0	0	0	0
PLEUROBEMA CORDATUM	5	0	11	18	13	31	25	21	54	70	290
PLEUROBEMA OVIFORME	0	0	0	0	0	0	0	0	0	0	1
PLEUROBEMA PLENUM	0	0	0	0	0	0	1	0	1	0	1
PLEUROBEMA RUBRUM	0	0	0	1	0	1	0	0	0	2	3
POTAMILUS ALATUS	0	0	0	3	5	2	1	2	6	7	77
PTYCHOBRANCHUS FASCIOLARIS	0	0	0	0	0	0	0	0	0	0	0
QUADRULA METANEVRA	0	0	0	0	0	0	0	2	0	2	16
QUADRULA PUSTULOSA	2	0	4	14	15	16	7	11	28	41	138
TRITOGONIA VERRUCOSA	0	1	0	0	0	0	0	0	0	1	19
SPECIMEN TOTALS	56	12	113	124	211	262	194	276	574	674	2490
NO. SPECIES	6	4	6	11	14	13	8	11	16	17	23

APPENDIX 7-G

SUMMARY OF MEASUREMENTS TAKEN OF FRESHWATER MUSSEL SPECIMENS ON THREE MUSSEL BEDS DURING SAMPLING IN 1983, 1984, AND 1985. MEASUREMENTS ARE REPORTED IN MILLIMETERS.

Appendix 7-G. Summary of Measurements Taken of Freshwater Mussel Specimens on Three Mussel Beds During Sampling in 1983, 1984, and 1985. Measurements are Reported in Millimeters.

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	2	104.30	102.60	106.00	76.50	72.90	80.10	49.50	46.80	52.20
AMBLEMA PLICATA	7	85.33	74.40	96.10	64.81	56.80	72.30	40.49	36.10	48.70
ANODONTA GRANDIS	-	-	-	-	-	-	-	-	-	-
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	83	75.88	62.10	92.60	65.39	52.10	80.20	38.28	32.40	46.80
CYPROGENIA STEGARIA	1	51.60	51.60	51.60	49.70	49.70	49.70	36.00	36.00	36.00
DROMUS DROMAS	1	60.10	60.10	60.10	58.30	58.30	58.30	32.80	32.80	32.80
ELLIPTIO CRASSIDENS	101	101.28	87.50	125.50	63.90	54.00	80.50	40.59	21.00	50.30
ELLIPTIO DILATATUS	4	104.32	98.20	113.30	44.92	42.20	48.80	32.60	30.20	34.70
FUSCONAIA MACULATA	1	56.70	56.70	56.70	48.30	48.30	48.30	39.70	39.70	39.70
LAMPSILIS ORBICULATA	2	91.40	83.70	99.10	67.05	61.40	72.70	44.75	43.40	46.10
LAMPSILIS OVATA	3	122.47	122.00	123.20	84.40	74.70	92.30	65.87	62.00	69.40
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	2	71.20	59.60	82.80	41.35	34.60	48.10	23.10	20.10	26.10
LIGUMIA RECTA	4	151.70	145.10	155.00	60.05	56.60	63.40	46.30	42.50	48.60
MEGALONAIAS GIGANTEA	-	-	-	-	-	-	-	-	-	-
OBLIQUARIA REFLEXA	1	48.30	48.30	48.30	24.10	24.10	24.10	24.60	24.60	24.60
PLAGIOLA LINEOLATA	28	80.30	56.80	94.50	62.14	44.60	72.00	37.72	30.10	48.80
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	100	90.57	72.10	108.80	72.31	60.60	84.80	45.72	31.40	59.80
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	2	61.10	58.10	64.10	54.70	52.90	56.50	37.60	36.40	38.80
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	11	122.31	46.90	156.90	88.34	71.10	104.90	35.58	30.60	40.90
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	18	73.75	63.50	85.30	58.97	52.30	68.00	43.76	38.30	49.20
QUADRULA PUSTULOSA	54	51.84	43.10	61.70	49.65	40.30	59.60	31.97	26.30	38.70
TRITOGONIA VERRUCOSA	-	-	-	-	-	-	-	-	-	-

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	1	105.50	105.50	105.50	70.30	70.30	70.30	53.60	53.60	53.60
AMBLEMA PLICATA	41	98.06	76.50	121.10	73.71	56.60	99.70	46.80	34.80	56.90
ANODONTA GRANDIS	22	124.84	101.60	154.60	68.28	55.30	89.60	53.76	39.60	67.90
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	32	82.55	66.40	94.70	70.40	60.80	78.10	40.98	34.20	49.80
CYPROGENIA STEGARIA	-	-	-	-	-	-	-	-	-	-
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	101	112.07	93.10	134.20	69.83	59.40	79.10	44.82	36.30	52.50
ELLIPTIO DILATATUS	1	102.20	102.20	102.20	46.30	46.30	46.30	31.20	31.20	31.20
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	1	103.10	103.10	103.10	84.40	84.40	84.40	58.20	58.20	58.20
LAMPSILIS OVATA	-	-	-	-	-	-	-	-	-	-
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	1	112.40	112.40	112.40	66.40	66.40	66.40	32.70	32.70	32.70
LIGUMIA RECTA	2	162.50	160.00	165.00	66.05	63.80	68.30	55.35	54.00	56.70
MEGALONAIAS GIGANTEA	3	173.83	164.40	180.60	117.43	111.70	120.70	60.50	57.20	63.00
OBLIQUARIA REFLEXA	18	54.35	45.10	64.10	44.40	35.30	51.50	34.88	25.50	41.40
PLAGIOLA LINEOLATA	13	90.57	71.10	96.50	71.33	61.50	78.60	42.22	36.60	50.90
PLETHOBASUS CYPHYUS	2	91.80	89.30	94.30	64.55	62.80	66.30	45.00	43.60	46.40
PLEUROBEMA CORDATUM	93	98.39	81.10	129.10	78.17	62.20	99.50	49.67	39.00	62.90
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	27	142.29	96.60	162.80	104.00	79.30	120.90	38.95	24.10	46.50
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	7	84.54	75.10	92.20	64.21	60.10	71.10	47.81	44.00	50.90
QUADRULA PUSTULOSA	63	57.01	46.20	66.00	55.09	46.30	66.00	35.49	28.20	43.80
TRITOGONIA VERRUCOSA	17	110.26	96.00	128.70	58.53	54.30	64.10	36.48	30.10	42.70

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	2	102.95	92.50	113.40	72.95	69.30	76.60	53.40	48.30	58.50
AMBLEMA PLICATA	5	103.20	84.70	132.30	75.74	64.10	94.60	40.42	30.40	51.30
ANODONTA GRANDIS	6	111.01	83.00	128.00	63.24	46.10	72.30	46.23	35.40	54.90
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	43	82.19	66.80	96.50	69.89	57.30	79.90	40.56	32.60	46.60
CYPROGENIA STEGARIA	2	56.45	52.90	60.00	51.14	50.90	51.38	38.71	36.82	40.60
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	102	110.49	86.80	134.60	68.14	54.40	89.90	43.39	34.90	56.10
ELLIPTIO DILATATUS	1	95.30	95.30	95.30	44.10	44.10	44.10	30.50	30.50	30.50
FUSCONAIA MACULATA	1	66.09	66.09	66.09	53.56	53.56	53.56	36.58	36.58	36.58
LAMPSILIS ORBICULATA	7	94.00	70.50	106.40	70.46	59.40	80.40	51.68	39.84	60.10
LAMPSILIS OVATA	1	132.30	132.30	132.30	91.64	91.64	91.64	76.30	76.30	76.30
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	1	81.70	81.70	81.70	48.20	48.20	48.20	29.50	29.50	29.50
LIGUMIA RECTA	3	155.31	145.80	160.12	62.95	60.30	65.14	51.84	50.60	53.82
MEGALONAIAS GIGANTEA	-	-	-	-	-	-	-	-	-	-
OBLIQUARIA REFLEXA	1	49.00	49.00	49.00	39.70	39.70	39.70	34.30	34.30	34.30
PLAGIOLA LINEOLATA	12	90.16	66.40	108.80	67.22	52.40	76.80	42.40	36.60	51.30
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	102	97.39	73.30	114.20	76.61	59.30	86.70	49.44	32.30	61.20
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	5	126.89	110.30	141.80	88.62	69.10	119.80	39.26	34.50	44.10
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	13	75.86	46.90	92.60	59.96	42.20	74.40	42.98	26.20	54.70
QUADRULA PUSTULOSA	57	57.27	44.80	69.90	54.45	42.10	66.90	35.05	28.80	43.50
TRITOGONIA VERRUCOSA	1	106.72	106.72	106.72	62.81	62.81	62.81	32.64	32.64	32.64

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	5	104.00	92.50	113.40	73.84	69.30	80.10	51.88	46.80	58.50
AMBLEMA PLICATA	53	96.86	74.40	132.30	72.73	56.60	99.70	45.37	30.40	56.90
ANODONTA GRANDIS	28	121.88	83.00	154.60	67.20	46.10	89.60	52.15	35.40	67.90
CYCLONAIAS TUBERCULATA	158	78.95	62.10	96.50	67.63	52.10	80.20	39.45	32.40	49.80
CYPROGENIA STEGARIA	3	54.83	51.60	60.00	50.66	49.70	51.38	37.81	36.00	40.60
DROMUS DROMAS	1	60.10	60.10	60.10	58.30	58.30	58.30	32.80	32.80	32.80
ELLIPTIO CRASSIDENS	304	107.96	86.80	134.60	67.29	54.00	89.90	42.93	21.00	56.10
ELLIPTIO DILATATUS	6	102.47	95.30	113.30	45.02	42.20	48.80	32.02	30.20	34.70
FUSCONAIA MACULATA	2	61.39	56.70	66.09	50.93	48.30	53.56	38.14	36.58	39.70
LAMPSILIS ORBICULATA	10	94.39	70.50	106.40	71.17	59.40	84.40	50.94	39.84	60.10
LAMPSILIS OVATA	4	124.92	122.00	132.30	86.21	74.70	92.30	68.47	62.00	76.30
LEPTODEA FRAGILIS	4	84.12	59.60	112.40	49.32	34.60	66.40	27.10	20.10	32.70
LIGUMIA RECTA	9	155.30	145.10	165.00	62.35	56.60	68.30	50.16	42.50	56.70
MEGALONAIAS GIGANTEA	3	173.83	164.40	180.60	117.43	111.70	120.70	60.50	57.20	63.00
OBLIQUARIA REFLEXA	20	53.78	45.10	64.10	43.15	24.10	51.50	34.33	24.60	41.40
PLAGIOLA LINEOLATA	53	85.05	56.80	108.80	65.54	44.60	78.60	39.88	30.10	51.30
PLETHOBASUS CYPHYUS	2	91.80	89.30	94.30	64.55	62.80	66.30	45.00	43.60	46.40
PLEUROBEMA CORDATUM	295	95.39	72.10	129.10	75.65	59.30	99.50	48.25	31.40	62.90
PLEUROBEMA PLENUM	2	61.10	58.10	64.10	54.70	52.90	56.50	37.60	36.40	38.80
POTAMILUS ALATUS	43	135.39	46.90	162.80	98.20	69.10	120.90	38.12	24.10	46.50
QUADRULA METANEVRA	38	76.46	46.90	92.60	60.27	42.20	74.40	44.24	26.20	54.70
QUADRULA PUSTULOSA	174	55.49	43.10	69.90	53.19	40.30	66.90	34.25	26.30	43.80
TRITOGONIA VERRUCOSA	18	110.06	96.00	128.70	58.77	54.30	64.10	36.27	30.10	42.70

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	-	-	-	-	-	-	-	-	-	-
AMBLEMA PLICATA	6	96.08	80.50	107.30	72.63	62.60	80.40	42.58	34.60	46.60
ANODONTA GRANDIS	-	-	-	-	-	-	-	-	-	-
ANODONTA IMBECILLIS	1	52.50	52.50	52.50	24.70	24.70	24.70	14.30	14.30	14.30
CYCLONAIAS TUBERCULATA	101	74.39	59.10	92.20	63.86	52.20	76.50	37.48	29.50	44.90
CYPROGENIA STEGARIA	1	52.90	52.90	52.90	51.40	51.40	51.40	36.40	36.40	36.40
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	101	104.82	89.20	122.70	66.24	56.30	78.40	41.70	24.40	60.90
ELLIPTIO DILATATUS	1	100.10	100.10	100.10	42.20	42.20	42.20	28.00	28.00	28.00
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	1	90.60	90.60	90.60	60.70	60.70	60.70	48.10	48.10	48.10
LAMPSILIS OVATA	1	102.10	102.10	102.10	72.90	72.90	72.90	56.50	56.50	56.50
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	-	-	-	-	-	-	-	-	-	-
LIGUMIA RECTA	5	149.30	140.90	155.90	57.52	50.50	60.30	46.68	40.00	49.70
MEGALONAIAS GIGANTEA	-	-	-	-	-	-	-	-	-	-
OBLIQUARIA REFLEXA	1	36.50	36.50	36.50	32.90	32.90	32.90	22.90	22.90	22.90
PLAGIOLA LINEOLATA	23	77.57	56.60	102.20	58.68	44.00	74.20	35.53	26.30	42.00
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	100	90.46	62.10	112.90	71.74	44.70	86.70	44.20	32.80	52.80
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	2	60.10	51.30	68.90	57.70	49.40	66.00	44.00	39.40	48.60
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	14	126.87	96.70	160.00	90.56	74.40	108.00	36.16	30.00	42.50
PTYCHOBRANCHUS FASCIOLARIS	1	94.40	94.40	94.40	56.70	56.70	56.70	34.80	34.80	34.80
QUADRULA METANEVRA	14	74.78	64.50	82.80	59.29	52.60	66.60	40.09	32.40	50.60
QUADRULA PUSTULOSA	53	53.28	40.00	74.10	50.63	39.50	64.10	31.69	22.00	40.10
TRITOGONIA VERRUCOSA	1	76.70	76.70	76.70	42.70	42.70	42.70	19.70	19.70	19.70

Appendix 7-G (Continued)

	N	LENGTH MEAN	LENGTH MIN	LENGTH MAX	WIDTH MEAN	WIDTH MIN	WIDTH MAX	THICKNESS MEAN	THICKNESS MIN	THICKNESS MAX
ACTINONAIAS LIGAMENTINA	-	-	-	-	-	-	-	-	-	-
AMBLEMA PLICATA	16	100.54	84.80	120.10	73.24	62.30	88.00	44.96	38.90	52.40
ANODONTA GRANDIS	8	127.31	104.30	144.30	68.77	56.60	74.10	50.76	42.10	54.60
ANODONTA IMBECILLIS	1	54.70	54.70	54.70	23.20	23.20	23.20	16.90	16.90	16.90
CYCLONAIAS TUBERCULATA	7	80.50	66.60	92.60	70.53	60.50	80.90	37.67	31.50	43.10
CYPROGENIA STEGARIA	-	-	-	-	-	-	-	-	-	-
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	100	111.95	96.90	130.80	70.98	60.50	82.40	44.64	38.20	53.10
ELLIPTIO DILATATUS	-	-	-	-	-	-	-	-	-	-
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	3	98.63	96.40	100.20	70.80	66.10	74.80	57.07	54.70	60.20
LAMPSILIS OVATA	1	139.80	139.80	139.80	92.60	92.60	92.60	68.80	68.80	68.80
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	5	109.62	104.50	118.10	65.02	62.10	68.40	35.10	30.90	38.40
LIGUMIA RECTA	-	-	-	-	-	-	-	-	-	-
MEGALONAIAS GIGANTEA	1	180.00	180.00	180.00	130.20	130.20	130.20	63.00	63.00	63.00
OBLIQUARIA REFLEXA	9	55.80	49.20	64.00	43.27	36.10	52.30	34.44	26.30	39.80
PLAGIOLA LINEOLATA	12	90.97	62.70	109.70	70.40	50.40	86.00	40.49	31.30	50.20
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	31	98.37	82.00	119.10	77.38	69.30	99.80	47.24	40.60	58.70
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	23	153.90	132.30	182.10	105.20	80.50	134.50	41.12	36.80	46.50
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	1	79.10	79.10	79.10	64.60	64.60	64.60	54.90	54.90	54.90
QUADRULA PUSTULOSA	29	59.12	50.20	66.80	55.92	49.50	61.70	34.46	29.40	40.80
TRITOGONIA VERRUCOSA	6	118.87	94.20	134.90	61.53	56.10	66.80	38.98	29.30	44.80

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	2	109.55	99.40	119.70	81.00	74.00	88.00	53.25	53.10	53.40
AMBLEMA PLICATA	8	95.05	73.60	113.80	71.76	59.50	84.30	37.02	26.80	48.40
ANODONTA GRANDIS	1	102.70	102.70	102.70	56.90	56.90	56.90	39.60	39.60	39.60
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	23	82.19	69.40	99.10	69.40	60.30	79.10	39.06	33.50	46.30
CYPROGENIA STEGARIA	-	-	-	-	-	-	-	-	-	-
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	101	112.00	94.70	129.80	69.07	58.00	78.50	43.58	36.00	54.50
ELLIPTIO DILATATUS	1	92.60	92.60	92.60	43.70	43.70	43.70	21.50	21.50	21.50
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	4	96.70	86.80	106.80	68.77	64.60	74.00	57.80	52.90	62.40
LAMPSILIS OVATA	3	132.67	118.50	142.70	88.90	82.00	102.70	70.83	63.50	76.70
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	1	119.90	119.90	119.90	66.50	66.50	66.50	40.80	40.80	40.80
LIGUMIA RECTA	9	162.78	146.60	185.20	60.77	56.10	66.60	51.30	44.00	54.90
MEGALONAIAS GIGANTEA	-	-	-	-	-	-	-	-	-	-
OBLIQUARIA REFLEXA	1	51.20	51.20	51.20	40.20	40.20	40.20	30.80	30.80	30.80
PLAGIOLA LINEOLATA	14	84.82	63.60	108.70	63.59	50.10	78.30	39.51	34.10	46.30
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	103	98.58	76.10	132.60	77.42	52.10	90.60	47.97	34.20	79.90
PLEUROBEMA OVIFORME	2	69.80	63.50	76.10	55.70	50.60	60.80	40.35	40.00	40.70
PLEUROBEMA PLENUM	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	10	139.25	110.20	163.20	91.64	72.50	102.30	40.80	34.30	44.80
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	9	84.71	72.50	94.80	67.19	56.90	76.10	46.33	39.70	50.90
QUADRULA PUSTULOSA	56	58.80	46.40	72.00	55.34	44.40	64.80	34.54	20.20	40.90
TRITOGONIA VERRUCOSA	3	104.83	84.60	121.40	59.37	49.50	64.40	29.40	24.30	32.40

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	2	109.55	99.40	119.70	81.00	74.00	88.00	53.25	53.10	53.40
AMBLEMA PLICATA	30	98.18	73.60	120.10	72.73	59.50	88.00	42.37	26.80	52.40
ANODONTA GRANDIS	9	124.58	102.70	144.30	67.46	56.60	74.10	49.52	39.60	54.60
ANODONTA IMBECILLIS	2	53.60	52.50	54.70	23.95	23.20	24.70	15.60	14.30	16.90
CYCLONAIAS TUBERCULATA	131	76.09	59.10	99.10	65.19	52.20	80.90	37.77	29.50	46.30
CYPROGENIA STEGARIA	1	52.90	52.90	52.90	51.40	51.40	51.40	36.40	36.40	36.40
ELLIPTIO CRASSIDENS	302	109.58	89.20	130.80	68.75	56.30	82.40	43.30	24.40	60.90
ELLIPTIO DILATATUS	2	96.35	92.60	100.10	42.95	42.20	43.70	24.75	21.50	28.00
LAMPSILIS ORBICULATA	8	96.66	86.80	106.80	68.52	60.70	74.80	56.31	48.10	62.40
LAMPSILIS OVATA	5	127.98	102.10	142.70	86.44	72.90	102.70	67.56	56.50	76.70
LEPTODEA FRAGILIS	6	111.33	104.50	119.90	65.27	62.10	68.40	36.05	30.90	40.80
LIGUMIA RECTA	14	157.96	140.90	185.20	59.61	50.50	66.60	49.65	40.00	54.90
MEGALONAIAS GIGANTEA	1	180.00	180.00	180.00	130.20	130.20	130.20	63.00	63.00	63.00
OBLIQUARIA REFLEXA	11	53.63	36.50	64.00	42.05	32.90	52.30	33.06	22.90	39.80
PLAGIOLA LINEOLATA	49	82.92	56.60	109.70	62.95	44.00	86.00	37.88	26.30	50.20
PLEUROBEMA CORDATUM	234	95.08	62.10	132.60	74.99	44.70	99.80	46.26	32.80	79.90
PLEUROBEMA OVIFORME	2	69.80	63.50	76.10	55.70	50.60	60.80	40.35	40.00	40.70
PLEUROBEMA PLENUM	2	60.10	51.30	68.90	57.70	49.40	66.00	44.00	39.40	48.60
POTAMILUS ALATUS	47	142.73	96.70	182.10	97.96	72.50	134.50	39.57	30.00	46.50
PTYCHOBRANCHUS FASCIOLARIS	1	94.40	94.40	94.40	56.70	56.70	56.70	34.80	34.80	34.80
QUADRULA METANEVRA	24	78.68	64.50	94.80	62.47	52.60	76.10	43.05	32.40	54.90
QUADRULA PUSTULOSA	138	56.75	40.00	74.10	53.65	39.50	64.80	33.43	20.20	40.90
TRITOGONIA VERRUCOSA	10	110.44	76.70	134.90	59.00	42.70	66.80	34.18	19.70	44.80

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	5	105.42	97.40	112.30	75.42	70.60	78.90	52.78	50.20	54.90
AMBLEMA PLICATA	3	94.77	92.10	97.90	69.83	69.10	70.30	39.80	36.60	42.80
ANODONTA GRANDIS	-	-	-	-	-	-	-	-	-	-
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	72	75.62	60.50	86.60	65.14	54.70	74.50	36.95	30.60	43.10
CYPROGENIA STEGARIA	1	57.70	57.70	57.70	55.60	55.60	55.60	44.10	44.10	44.10
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	101	104.43	90.10	122.50	65.82	54.10	88.50	41.43	29.50	50.90
ELLIPTIO DILATATUS	1	96.80	96.80	96.80	44.20	44.20	44.20	29.80	29.80	29.80
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	2	96.45	82.30	110.60	71.65	69.80	73.50	51.95	43.50	60.40
LAMPSILIS OVATA	1	121.20	121.20	121.20	86.50	86.50	86.50	62.30	62.30	62.30
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	-	-	-	-	-	-	-	-	-	-
LIGUMIA RECTA	4	158.92	142.20	170.20	59.87	57.20	60.80	45.15	41.30	48.50
MEGALONAIAS GIGANTEA	2	165.15	160.10	170.20	109.35	102.30	116.40	54.45	52.40	56.50
OBLIQUARIA REFLEXA	1	46.60	46.60	46.60	36.10	36.10	36.10	23.40	23.40	23.40
PLAGIOLA LINEOLATA	7	79.13	62.30	92.50	61.27	46.90	69.90	34.84	32.00	36.20
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	88	91.57	70.40	108.50	73.40	58.20	89.50	43.91	30.20	52.70
PLEUROBEMA OVIFORME	1	72.90	72.90	72.90	56.50	56.50	56.50	40.20	40.20	40.20
PLEUROBEMA PLENUM	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA RUBRUM	1	80.70	80.70	80.70	64.30	64.30	64.30	44.50	44.50	44.50
POTAMILUS ALATUS	15	128.51	98.00	150.70	87.92	76.50	106.70	36.53	30.90	40.70
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	11	75.45	67.30	88.20	60.21	56.10	70.30	40.83	36.80	46.20
QUADRULA PUSTULOSA	26	54.20	46.30	72.80	51.48	44.70	64.30	31.89	25.70	37.40
TRITOGONIA VERRUCOSA	1	104.10	104.10	104.10	52.80	52.80	52.80	36.10	36.10	36.10

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	-	-	-	-	-	-	-	-	-	-
AMBLEMA PLICATA	20	100.06	84.10	119.50	71.56	58.20	84.80	43.86	36.10	56.70
ANODONTA GRANDIS	6	122.98	108.70	142.60	72.18	62.90	80.40	50.47	41.90	58.70
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	11	82.09	73.50	91.50	70.28	62.10	76.60	39.97	35.60	42.70
CYPROGENIA STEGARIA	-	-	-	-	-	-	-	-	-	-
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	105	111.88	90.70	134.80	70.36	60.10	82.90	43.96	34.20	53.70
ELLIPTIO DILATATUS	1	100.80	100.80	100.80	44.20	44.20	44.20	34.80	34.80	34.80
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS OVATA	2	127.20	120.80	133.60	81.15	76.10	86.20	63.05	61.50	64.60
LASMIGONA COMPLANATA	-	-	-	-	-	-	-	-	-	-
LEPTODEA FRAGILIS	4	103.30	86.90	114.70	61.30	55.40	66.80	34.37	30.20	39.80
LIGUMIA RECTA	1	170.10	170.10	170.10	72.40	72.40	72.40	50.10	50.10	50.10
MEGALONAIAS GIGANTEA	1	190.80	190.80	190.80	121.10	121.10	121.10	57.10	57.10	57.10
OBLIQUARIA REFLEXA	8	57.25	52.40	66.90	43.74	40.10	50.80	33.39	30.10	36.60
PLAGIOLA LINEOLATA	13	89.20	80.90	100.40	69.52	62.30	76.90	39.52	34.90	46.80
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	52	103.59	83.60	160.20	81.47	66.50	134.90	46.31	34.30	54.40
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA RUBRUM	-	-	-	-	-	-	-	-	-	-
POTAMILUS ALATUS	49	143.15	104.70	170.20	103.43	81.60	125.60	40.52	28.40	49.60
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	3	85.90	80.60	88.90	67.27	64.70	70.30	43.80	40.20	50.30
QUADRULA PUSTULOSA	43	60.61	46.30	72.30	57.34	32.10	68.10	36.61	28.90	44.20
TRITOGONIA VERRUCOSA	17	125.20	92.30	148.80	61.35	40.60	70.00	40.43	34.10	48.70

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	6	104.13	92.70	113.40	72.30	66.80	80.30	50.88	46.60	54.60
AMBLEMA PLICATA	19	108.21	76.30	132.50	79.99	62.90	94.90	42.61	30.50	54.40
ANODONTA GRANDIS	4	123.37	107.90	130.10	65.80	60.90	69.60	46.20	40.70	50.10
ANODONTA IMBECILLIS	-	-	-	-	-	-	-	-	-	-
CYCLONAIAS TUBERCULATA	41	82.26	70.50	94.60	68.68	59.50	78.40	38.85	32.00	44.90
CYPROGENIA STEGARIA	-	-	-	-	-	-	-	-	-	-
DROMUS DROMAS	-	-	-	-	-	-	-	-	-	-
ELLIPTIO CRASSIDENS	100	114.33	99.10	130.50	69.92	20.10	84.70	44.20	36.10	52.40
ELLIPTIO DILATATUS	-	-	-	-	-	-	-	-	-	-
FUSCONAIA MACULATA	-	-	-	-	-	-	-	-	-	-
LAMPSILIS ORBICULATA	6	103.77	92.60	113.30	75.07	64.40	81.10	56.83	50.60	64.40
LAMPSILIS OVATA	6	128.43	114.00	142.00	84.58	70.00	103.40	62.65	57.30	70.20
LASMIGONA COMPLANATA	1	180.20	180.20	180.20	114.30	114.30	114.30	40.30	40.30	40.30
LEPTODEA FRAGILIS	1	88.20	88.20	88.20	50.20	50.20	50.20	28.60	28.60	28.60
LIGUMIA RECTA	6	168.92	154.40	180.30	64.07	60.20	72.40	53.33	49.90	60.40
MEGALONAIAS GIGANTEA	2	173.70	172.20	175.20	118.25	116.80	119.70	66.15	60.90	71.40
OBLIQUARIA REFLEXA	3	54.67	50.50	58.80	43.13	40.20	46.80	33.50	30.90	36.70
PLAGIOLA LINEOLATA	15	90.71	70.10	98.40	68.05	52.20	76.10	40.40	36.40	44.70
PLETHOBASUS CYPHYUS	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA CORDATUM	105	96.94	76.30	112.20	76.82	60.60	89.90	46.09	34.10	59.10
PLEUROBEMA OVIFORME	-	-	-	-	-	-	-	-	-	-
PLEUROBEMA PLENUM	1	84.60	84.60	84.60	70.20	70.20	70.20	50.60	50.60	50.60
PLEUROBEMA RUBRUM	2	91.60	90.40	92.80	73.20	71.60	74.80	50.60	49.80	51.40
POTAMILUS ALATUS	13	140.13	102.60	155.20	102.73	80.60	119.50	41.25	30.60	46.80
PTYCHOBRANCHUS FASCIOLARIS	-	-	-	-	-	-	-	-	-	-
QUADRULA METANEVRA	2	80.70	76.90	84.50	63.45	62.80	64.10	48.90	43.60	54.20
QUADRULA PUSTULOSA	69	57.78	48.50	80.50	54.68	44.80	68.80	34.83	26.30	42.80
TRITOGONIA VERRUCOSA	1	136.10	136.10	136.10	72.00	72.00	72.00	34.00	34.00	34.00

Appendix 7-G (Continued)

		LENGTH			WIDTH			THICKNESS		
	N	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ACTINONAIAS LIGAMENTINA	11	104.72	92.70	113.40	73.72	66.80	80.30	51.75	46.60	54.90
AMBLEMA PLICATA	42	103.37	76.30	132.50	75.25	58.20	94.90	43.01	30.50	56.70
ANODONTA GRANDIS	10	123.14	107.90	142.60	69.63	60.90	80.40	48.76	40.70	58.70
CYCLONAIAS TUBERCULATA	124	78.39	60.50	94.60	66.76	54.70	78.40	37.85	30.60	44.90
CYPROGENIA STEGARIA	1	57.70	57.70	57.70	55.60	55.60	55.60	44.10	44.10	44.10
ELLIPTIO CRASSIDENS	306	110.22	90.10	134.80	68.72	20.10	88.50	43.21	29.50	53.70
ELLIPTIO DILATATUS	2	98.80	96.80	100.80	44.20	44.20	44.20	32.30	29.80	34.80
LAMPSILIS ORBICULATA	8	101.94	82.30	113.30	74.21	64.40	81.10	55.61	43.50	64.40
LAMPSILIS OVATA	9	127.36	114.00	142.00	84.03	70.00	103.40	62.70	57.30	70.20
LASMIGONA COMPLANATA	1	180.20	180.20	180.20	114.30	114.30	114.30	40.30	40.30	40.30
LEPTODEA FRAGILIS	5	100.28	86.90	114.70	59.08	50.20	66.80	33.22	28.60	39.80
LIGUMIA RECTA	11	165.39	142.20	180.30	63.30	57.20	72.40	50.06	41.30	60.40
MEGALONAIAS GIGANTEA	5	173.70	160.10	190.80	115.26	102.30	121.10	59.66	52.40	71.40
OBLIQUARIA REFLEXA	12	55.72	46.60	66.90	42.95	36.10	50.80	32.58	23.40	36.70
PLAGIOLA LINEOLATA	35	87.83	62.30	100.40	67.24	46.90	76.90	38.96	32.00	46.80
PLEUROBEMA CORDATUM	245	96.42	70.40	160.20	76.58	58.20	134.90	45.35	30.20	59.10
PLEUROBEMA OVIFORME	1	72.90	72.90	72.90	56.50	56.50	56.50	40.20	40.20	40.20
PLEUROBEMA PLENUM	1	84.60	84.60	84.60	70.20	70.20	70.20	50.60	50.60	50.60
PLEUROBEMA RUBRUM	3	87.97	80.70	92.80	70.23	64.30	74.80	48.57	44.50	51.40
POTAMILUS ALATUS	77	139.79	98.00	170.20	100.29	76.50	125.60	39.87	28.40	49.60
QUADRULA METANEVRA	16	78.07	67.30	88.90	61.94	56.10	70.30	42.39	36.80	54.20
QUADRULA PUSTULOSA	138	57.98	46.30	80.50	54.91	32.10	68.80	34.83	25.70	44.20
TRITOGONIA VERRUCOSA	19	124.66	92.30	148.80	61.46	40.60	72.00	39.86	34.00	48.70

APPENDIX 8-A

DESCRIPTION OF EXPERIMENTAL GILL NET AND HOOP NET SITES AT TWO STATIONS IN CHICKAMAUGA RESERVOIR NEAR WATTS BAR NUCLEAR PLANT. RIGHT AND LEFT SHORELINE/BANK DESIGNATIONS REFER TO THOSE RESPECTIVE SIDES OF THE RESERVOIR AS THE OBSERVER IS FACING DOWNSTREAM. ALL DEPTHS ARE DURING NORMAL SUMMER POOL. WITH RESPECT TO EXPERIMENTAL GILL NETS, DEPTHS REFER TO THE DEEPEST PART OF THE NET.

Appendix 8-A. Description of Experimental Gill Net and Hoop Net Sites at Two Stations in Chickamauga Reservoir near Watts Bar Nuclear Plant. Right and Left Shoreline/Bank Designations Refer to Those Respective Sides of the Reservoir as the Observer is Facing Downstream. All Depths are During Normal Summer Pool. With Respect to Experimental Gill Nets, Depths Refer to the Deepest Part of the Net.

Net A(1)* This net is located on the right shoreline upstream of the WBN intake channel immediately downstream of the mouth of a small tributary. Water depths of 4.6 m (15 feet), a sandy bank, and mud substrate with a few stumps and log debris in the area characterize this site. In summer, aquatic vegetation** is sparsely present in this area.

Net A(2) This site is on the right shoreline immediately upstream of the riprapped area for the WBN intake channel along a relatively straight shoreline. A mud/silt substrate which drops of abruptly, no aquatic vegetation, and few stumps (at the waters edge), trees, and shrubs characterize this area. Nets at this site are located in 4.6 to 6.1 m (15-20 feet) of water.

Net A(3) Located on the left shoreline across the river from net number A(1) and immediately downstream from the mouth of Watts Creek, this site is characterized by a sandy steep bank, mud/silt substrate, dead trees/branches in the water, and a small aquatic vegetation bed. Opposite the creek mouth and approximately 30.5 m (100 feet) from the bank are several groups of large rocks which come to within a few feet of the surface. Trees and shrubs comprise the primary vegetation type along the bank. Samples were collected in approximately 3.0 m (10 feet) of water.

Net A(4) This site is located in a slight indentation on the left bank downstream of site A(3) in approximately 3.0 meters (10 feet) of water. Riparian vegetation consists of small trees and shrubs growing on a gradually sloping bank comprised of rubble and larger rocks. The substrate is mud/silt and rubble, and a small amount of milfoil is present during the summer months.

Net A(5) Located on the right shoreline immediately downstream of the mouth of the WBN intake channel, this site is characterized by a sloping riprapped bank and no riparian or aquatic vegetation. Nets at this site are set in 3.0 to 3.7 m (10-12 feet) of water over a mud/silt substrate which drops off abruptly.

Net A(6) This sampling area is on the right shoreline downstream of station A(5) and immediately upstream of the WBN diffusers. The bank area is sandy with very little slope and no vegetation. Farther back from the water, the bank slopes sharply and is covered with tall grass. Nets at this site are set over a mud/silt substrate in approximately 2.4 m (8 feet) of water. Aquatic vegetation is sparse, and there are very few stumps and no floating debris in the area.

Net A(7)	Located on the right shoreline 102.1 m (335 feet) downstream of the WBN diffusers, the description for this area is identical to that for net site A(6).
Net A(8)	Located on the right shoreline 163.1 m (535 feet) downstream of the WBN diffusers, this site is also identical in description to that for net site A(6).
Net B(5)	This site, which is relatively unique with respect to habitat, is on the right shoreline across the reservoir and upstream from the mouth of Sewee Creek. The net, set in approximately 18.3 m (60 feet) of water, is downstream of a large rock outcrop located on a point where the shoreline curves in towards the channel. Depths upstream of the site near the rock outcropping are approximately 10.7 m (35 feet) and the net site is affected by a strong back eddy downstream of the point. The immediate shoreline is sandy with dead trees leaning into the water. Riparian vegetation consists of brush and small to large trees growing on a sloping bank and overhanging the water. The substrate is composed primarily of mud/silt with submerged stumps and dead trees present. There is little or no aquatic vegetation in the area.
Net B(6)	Nets at this site were fished on the right shoreline across the reservoir, and downstream of, the mouth of Sewee Creek. The immediate shore line is sandy with trees leaning into the water. The substrate is composed of mud/silt, and aquatic vegetation is present during the summer months. The water depth at this site is 3.7 to 4.6 m (12-15 feet).
Net B(7)	This site is located on the left shoreline upstream from the mouth of Sewee Creek and adjacent to an agricultural field. There is a gradual sloping sandy bank in the area with debris and numerous tree stumps immediately off shore. Riparian vegetation consists of shrubs and small trees. Aquatic vegetation is present near the shoreline during the summer months. The net is set over a mud substrate in approximately 1.2 to 1.8 m (4-6 feet) of water.
Net B(8)	Large trees along the shore partially shade this site which is located immediately downstream of Sewee Creek. A gradually sloping mud/silt substrate, the presence of aquatic vegetation during the summer months, and a sandy beach with debris and numerous stumps located immediately off-shore characterized this site. Depths in this area range from 1.2 to 1.8 m (4-6 feet).

*Refers to station A, net site 1, etc.

**Aquatic vegetation in the area is primarily composed of eurasian watermilfoil (Myriophyllum spicatum L.) and spinyleaf naiad (Najas minor All.)

APPENDIX 8-B

NUMBER OF NET NIGHTS AND DATES OF PREOPERATIONAL SAMPLING WITH EXPERIMENTAL GILL NETS AT TWO STATIONS NEAR WATTS BAR NUCLEAR PLANT (FEBRUARY 1977 THROUGH DECEMBER 1979 AND MARCH 1982 THROUGH DECEMBER 1985)

Appendix 8-B. Number of Net Nights and Dates of Preoperational Sampling with Experimental Gill Nets at Two Stations Near Watts Bar Nuclear Plant (February 1977 through December 1979 and March 1982 through December 1985).

		Station A								Station B			
		Sites								Sites			
Quarter	Date	1	2	3	4	5	6	7	8	5	6	7	8
Winter 1977	02/15-16/1977	*2	2	2	2	-	-	-	-	-	-	-	-
	02/22-23/1977	-	-	-	-	-	-	-	-	2	2	2	2
Spring 1977	04/26-27/1977	2	2	2	2	-	-	-	-	1	1	1	1
Summer 1977	06/20-21/1977	2	2	2	2	-	-	-	-	2	2	2	2
	08/15-18/1977	4	4	4	4	-	-	-	-	4	4	3	4
Fall 1977	10/31-11/03/1977	3	3	4	4	-	-	-	-	4	4	4	4
Winter 1978	01/09-11/1978	3	3	3	3	-	-	-	-	3	3	3	3
Spring 1978	03/07-08/1978	2	2	2	2	-	-	-	-	2	2	2	2
	04/04-05/1978	2	2	2	2	-	-	-	-	2	2	2	2
	05/08-09/1978	2	2	2	2	-	-	-	-	2	2	2	2
Summer 1978	06/06-07/1978	2	2	2	2	-	-	-	-	2	2	2	2
	07/19-20/1978	2	2	2	2	2	2	-	-	2	2	2	2
	08/23-24/1978	2	2	2	2	2	2	-	-	2	2	2	2
Fall 1978	09/19-20/1978	2	2	2	2	2	2	-	-	2	2	2	2
	10/11-12/1978	2	2	2	2	2	2	-	-	2	2	2	2
	11/15-16/1978	2	2	2	2	2	2	-	-	2	2	2	2
Winter 1979	12/05-06/1978	2	2	2	2	1	2	-	-	2	2	2	2
	02/20-21/1979	2	2	1	1	2	1	-	-	2	2	2	2
Spring 1979	03/28-29/1979	2	2	2	2	2	2	-	-	2	2	2	2
	04/24-25/1979	2	2	2	2	1	1	-	-	2	2	2	2
	05/21-22/1979	2	2	2	2	2	2	-	-	2	2	2	2
Summer 1979	06/26-27/1979	1	2	2	2	2	2	-	-	2	2	2	2
	07/17-18/1979	2	2	2	2	2	2	-	-	1	2	2	1
	08/07-08/1979	2	2	2	2	2	2	-	-	2	2	2	2
Fall 1979	09/04-05/1979	2	2	1	2	2	2	-	-	2	2	2	2
	10/09-10/1979	2	2	2	2	2	1	-	-	2	2	0	2
	11/13-14/1979	2	2	1	2	2	1	-	-	2	2	2	2
Spring 1982	03/09-10/1982	2	2	2	2	2	2	-	-	2	2	2	2
	04/07-08/1982	2	1	2	2	2	2	-	-	2	1	2	1
	05/04-05/1982	2	2	2	2	2	2	-	-	2	2	2	2

Appendix 8-B (Continued)

Quarter	Date	Station A Sites 1	2	3	4	5	6	7	8	Station B Sites 5	6	7	8
Summer 1982	06/08-09/1982	2	2	2	2	2	2	-	-	2	2	2	2
	07/07-08/1982	2	1	2	2	2	2	-	-	2	2	2	2
	08/03-04/1982	1	1	2	2	2	1	-	-	2	2	1	2
Fall 1982	09/08-09/1982	2	2	2	2	2	2	-	-	2	2	2	2
	10/05-06/1982	2	2	2	1	2	2	-	-	2	2	2	2
	11/08-09/1982	2	2	2	2	2	2	-	-	1	1	2	2
Winter 1983	12/07-08/1982	2	2	2	2	2	2	-	-	2	2	2	2
	01/05-06/1983	2	2	2	2	2	2	-	-	2	2	2	2
	02/07-08/1983	2	2	2	2	2	2	-	-	1	1	1	1
Spring 1983	03/08-09/1983	2	2	2	2	2	1	-	-	2	2	2	2
	04/12-13/1983	2	2	2	2	2	2	-	-	2	2	2	2
	05/10-11/1983	2	2	2	2	2	2	-	-	2	2	2	2
Summer 1983	06/20-21/1983	2	2	2	2	2	2	-	-	2	2	2	2
	07/06-07/1983	2	2	2	2	2	2	-	-	2	2	2	2
	08/09-10/1983	2	2	2	1	2	2	-	-	2	2	2	2
Fall 1983	09/07-08/1983	2	2	2	2	0	2	-	-	2	2	2	2
	10/04-05/1983	2	2	2	1	2	2	-	-	2	2	2	2
	11/21-22/1983	2	2	2	2	2	2	-	-	2	1	2	2
Winter 1984	12/20-21/1983	2	2	2	2	2	2	-	-	1	1	2	2
	01/10-11/1984	2	2	2	2	2	2	-	-	2	2	2	2
	02/07-08/1984	1	2	2	2	2	2	-	-	2	2	2	2
Spring 1984	03/06-07/1984	2	2	2	2	2	2	-	-	2	2	2	2
	04/10-11/1984	2	2	2	2	2	2	2	2	2	2	2	2
	05/29-30/1984	2	2	2	2	2	2	2	2	2	2	2	2
Summer 1984	06/12-13/1984	2	2	2	2	2	2	2	2	2	2	2	1
	07/10-11/1984	2	2	2	2	2	2	2	2	2	2	2	2
	08/08-09/1984	1	2	2	2	2	2	2	2	2	2	2	2
Fall 1984	09/11-12/1984	2	2	2	2	2	2	2	2	2	2	2	2
	10/09-10/1984	2	2	2	2	2	2	2	2	2	2	2	2
	11/06-07/1984	2	2	2	2	2	2	2	2	2	2	2	2

Appendix 8-8 (Continued)

Quarter	Date	Station A Sites 1	2	3	4	5	6	7	8	Station B Sites 5	6	7	8
Winter 1985	12/04-05/1984	2	2	2	2	1	2	2	2	2	2	2	2
	01/08-09/1985	2	2	2	2	2	2	1	2	0	2	1	1
	02/19-20/1985	2	2	2	2	2	2	1	2	2	2	2	2
Spring 1985	03/12-13/1985	2	2	2	2	2	1	1	2	2	2	2	2
	04/09-10/1985	2	2	2	2	2	2	2	2	1	2	2	2
	05/13-14/1985	2	0	2	2	2	2	2	2	2	2	2	2
Summer 1985	06/10-11/1985	2	2	2	2	2	2	2	2	1	2	1	2
	07/08-09/1985	2	2	2	2	2	2	2	2	2	2	2	2
	08/06-07/1985	2	2	2	2	2	1	2	2	2	2	2	2
Fall 1985	09/10-11/1985	2	2	2	0	2	2	2	2	2	2	1	2
	10/07-08/1985	2	2	2	2	2	2	2	2	2	2	2	2
	11/05-06/1985	2	2	2	2	2	2	2	2	2	2	2	2
Winter 1986	12/10-11/1985	2	2	2	2	2	2	2	2	2	2	2	2
Total effort		144	143	146	143	119	116	39	42	140	143	140	143

*Number of net nights fished during the indicated time period.

APPENDIX 8-C

NUMBER OF NET NIGHTS AND DATES OF PREOPERATIONAL SAMPLING WITH HOOP NETS AT TWO STATIONS NEAR WATTS BAR NUCLEAR PLANT (FEBRUARY 1977 THROUGH DECEMBER 1979 AND MARCH 1982 THROUGH DECEMBER 1985)

Appendix 8-C. Number of Net Nights and Dates of Preoperational Sampling with Hoop Nets at Two Stations near Watts Bar Nuclear Plant (February 1977 through December 1979 and March 1982 through December 1985).

		Station A Sites								Station B Sites			
Quarter	Date	1	2	3	4	5	6	7	8	5	6	7	8
Winter 1977	02/09-11/1977	*3	3	3	3	-	-	-	-	3	3	3	3
Spring 1977	04/19-22/1977	3	3	3	3	-	-	-	-	3	3	3	3
Summer 1977	07/12-15/1977	4	4	4	4	-	-	-	-	4	4	4	4
	08/09-12/1977	4	4	4	4	-	-	-	-	4	4	4	4
Fall 1977	10/18-21/1977	3	3	3	3	-	-	-	-	3	3	3	3
Winter 1978	12/13-16/1978	4	4	4	4	-	-	-	-	4	4	4	4
	01/31/78-02/03/78	4	4	4	4	-	-	-	-	4	4	4	4
Spring 1978	03/14-17/1978	4	4	4	4	-	-	-	-	3	3	3	3
	04/18-21/1978	4	4	4	4	-	-	-	-	4	4	4	4
Summer 1978	06/27-30/1978	4	4	4	4	4	4	-	-	4	4	4	4
	08/15-18/1978	4	4	4	4	4	4	-	-	4	4	4	4
Fall 1978	10/17-20/1978	3	3	3	3	3	3	-	-	3	3	3	3
Winter 1979	12/12-15/1978	4	4	4	4	4	4	-	-	4	4	4	4
	02/13-16/1979	4	4	4	4	4	4	-	-	4	4	4	4
Spring 1979	04/03-06/1979	4	4	4	4	4	4	-	-	4	4	4	4
Summer 1979	06/19-22/1979	4	4	4	4	4	4	-	-	4	4	4	4
	08/14-17/1979	4	4	4	4	4	4	-	-	4	4	4	4
Fall 1979	10/16-19/1979	4	4	4	4	4	4	-	-	4	4	4	4
Spring 1982	03/17-18/1982	2	2	2	2	2	2	-	-	2	2	2	2
	04/14-15/1982	2	2	2	2	2	2	-	-	2	2	2	2
	05/12-13/1982	2	2	2	2	2	2	-	-	2	2	2	2
Summer 1982	06/17-18/1982	2	2	2	2	2	2	-	-	2	2	2	2
	07/14-15/1982	2	2	2	2	2	2	-	-	2	2	2	2
	08/11-12/1982	2	2	2	2	2	2	-	-	2	2	2	2
Fall 1982	09/15-16/1982	2	2	2	2	2	2	-	-	2	2	2	2
	10/27/1982	1	1	1	1	1	1	-	-	1	1	1	1
	11/18-19/1982	2	2	1	2	2	2	-	-	2	2	2	2

Appendix 8-C (Continued)

Quarter	Date	Station A Sites 1	2	3	4	5	6	7	8	Station B Sites 5	6	7	8
Winter 1983	12/14-15/1982	2	2	2	2	2	2	-	-	2	2	2	2
	01/12-13/1983	2	2	2	2	2	2	-	-	2	2	2	2
	02/15-16/1983	2	2	2	2	2	2	-	-	2	2	2	2
Spring 1983	03/16-17/1983	2	2	2	2	2	2	-	-	2	2	2	2
	04/07-08/1983	2	2	2	2	2	2	-	-	2	2	2	2
	05/25-26/1983	2	2	2	2	2	2	-	-	2	2	2	2
Summer 1983	06/08-09/1983	2	2	2	2	2	2	-	-	2	2	2	2
	07/13-14/1983	2	2	2	2	2	2	-	-	2	2	2	2
	08/03-04/1983	1	1	2	2	2	2	-	-	2	2	2	2
Fall 1983	09/14-15/1983	2	2	2	2	2	2	-	-	2	2	2	2
	10/13-14/1983	2	2	2	2	2	2	-	-	2	2	2	2
	11/02-03/1983	2	2	2	2	2	2	-	-	2	2	2	2
Winter 1984	12/08-09/1983	2	2	2	2	2	1	-	-	2	2	2	2
	01/18-19/1984	2	2	2	2	2	2	-	-	2	2	2	2
	02/15-16/1984	2	2	2	2	2	2	-	-	2	2	2	2
Spring 1984	03/14-15/1984	2	2	2	2	2	2	-	-	2	2	2	2
	04/18-19/1984	2	2	2	2	2	2	2	2	2	2	2	2
	05/23-24/1984	2	2	2	2	2	2	2	2	2	2	2	2
Summer 1984	06/20-21/1984	2	2	1	2	2	2	2	2	2	2	2	2
	07/18-19/1984	2	2	2	2	2	2	2	2	2	2	2	2
	08/22-23/1984	2	2	2	2	2	2	2	2	2	2	2	2
Fall 1984	09/19-20/1984	2	2	2	2	2	2	2	2	2	2	2	2
	10/18-19/1984	2	2	2	2	2	2	2	2	2	2	2	2
	11/14-15/1984	2	2	2	2	2	2	2	2	2	2	2	2
Winter 1985	12/12-13/1984	2	2	2	2	2	2	2	2	2	2	2	2
	01/16-17/1985	2	2	2	2	2	2	2	2	2	2	2	2
	02/26-27/1985	2	2	2	2	2	2	2	2	2	2	2	2
Spring 1985	03/20-21/1985	2	2	2	2	2	2	2	2	2	2	2	2
	04/17-18/1985	2	2	2	2	2	2	2	2	2	2	2	2
	05/08-09/1985	2	2	2	2	2	2	2	2	2	2	2	2
Summer 1985	06/04-05/1985	2	2	2	2	2	2	2	2	2	2	2	2
	07/18-19/1985	2	2	2	2	2	2	2	2	2	2	2	2
	08/14-15/1985	2	2	2	2	2	2	2	2	2	2	2	2

Appendix 8-C (Continued)

Quarter	Date	Station A Sites								Station B Sites			
		1	2	3	4	5	6	7	8	5	6	7	8
Fall 1985	09/17-18/1985	2	2	2	2	2	2	2	2	2	2	2	2
	10/16-17/1985	2	2	2	2	2	2	2	2	2	2	2	2
	11/13-14/1985	2	2	2	2	2	2	2	2	2	2	2	2
Winter 1986	12/17-18/1985	2	2	2	2	2	2	2	2	2	2	2	2
	Total effort	158	158	157	159	126	125	42	42	158	158	158	158

*Number of net nights fished during the indicated time period.

APPENDIX 8-D

ELECTROFISHING SITE DESCRIPTIONS AT STATIONS A AND B NEAR WATTS BAR NUCLEAR PLANT (WBN) IN UPPER CHICKAMAUGA RESERVOIR, 1982 TO 1985

Appendix 8-D. Electrofishing Site Descriptions at Stations A and B Near Watts Bar Nuclear Plant (WBN) in Upper Chickamauga Reservoir, 1982 to 1985.

Station-Site	Bank*	Description
A-1	L	Tree-covered rock and rock-rubble banks backed by woods. Summer--Vegetation extends to water's edge with minimal amounts of submergent vegetation. Rock to sand substrate. 2.0-3.0 m deep.
A-2	L	Rock rubble and shale rock banks backed by reclaimed field. Summer--Bank covered with scattered mixed grasses and low brush. A narrow band of submergent vegetation is evident. Rock to sand substrate. 0.8-1.5 m deep.
A-3	L	Same as A-2 except banks are steeper. 1.0-2.0 m deep.
A-4	L	Steep mud banks backed by a reclaimed field. Mud substrate with scattered stumps. Summer--Narrow band of submergent vegetation follows shoreline. 0.9 to 1.7 m deep.
A-5	L	Low rock rubble banks with scattered tree cover. Banks flood at higher summer pool levels. Summer--Bank vegetation to water's edge. Narrow band of submergent vegetation. Rock to sand substrate. 0.5-1.2 m deep.
A-6	R	Crumbling dirt banks backed by brush covered WBN land. Summer--Grasses and brush extend to water's edge. Narrow band of submergent vegetation. Winter--Sandy, gently sloping bank with no drift. Sand and mud substrate. 0.6-1.2 m deep.
A-7	R	Same as A-6. Starts at submerged diffuser pipe location. 0.8-1.0 m deep.

Appendix 8-D (Continued)

Station-Site	Bank*	Description
A-8	R	First 25 m runs along riprap above intake channel. Steep dirt banks are backed by WBN brush-covered land. Trees and drift in water. Summer--Vegetation to water's edge. Narrow band of submergent vegetation in all areas above riprap. Winter--Sandy bank, no vegetation. Sandy to mud substrate. 0.6-1.2 m deep.
A-9	R	Site starts at drainage slough backed by WBN brush-covered land. Low dirt banks are covered with brush and grasses. First 1/4 site - drift and trees in water, last 3/4 site - no drift or trees in water. Summer--Band of submergent vegetation. Dirt bank with vegetation to water's edge. Winter--Sand and mud bank with no vegetation. Mud substrate. 0.5-1.0 m deep.
A-10	R	Low dirt banks are backed by brush-covered WBN plant land. A plant site discharge enters the reservoir in the upper end of the sample site. Summer--Brush and grasses extend to water's edge. Submergent vegetation on all portions of shoreline. Winter--Sandy shoreline with no vegetation. Gravel, sand, and mud substrate. 0.3-0.9 m deep.
B-1	L	Dirt banks 2-3 m high backed by woods. Drift in water along shoreline with fallen trees. Scattered, submerged stumps throughout area. Summer--Low brushes and trees overhang water's edge. Band of submergent vegetation follows shoreline. Winter--Narrow, sandy shoreline with exposed stumps in water. Mud substrate with sand. 0.8-2.0 m deep.

Appendix 8-D (Continued)

Station-Site	Bank*	Description
B-2	L	Same as B-1 except located immediately below the mouth of Sewee Creek. 0.8-1.5 deep.
B-3	L	Dirt banks 2-3 m high backed by agricultural fields. Located immediately above the mouth of Sewee Creek. Scattered, submerged stumps throughout site with a small amount of drift. Summer--Low brushes and grasses extend over water. Band of submergent vegetation follows shoreline. Winter--Narrow, sandy shoreline with exposed stumps in water. Mud substrate. 0.3-1.0 m deep.
B-4	L	Same as B-3.
B-5	L	Same as B-3.
B-6	R	Dirt banks 3-4 m high backed by woods. Fallen trees and drift in water. Bank eroding badly. Summer--Narrow band of submerged vegetation follows shoreline. Mud substrate. 1.0-2.5 m deep.
B-7	R	Same as B-6.
B-8	R	Site starts immediately below large boulders that extend underwater. 1/2 site boulders, 1/2 site steep (4-6 m) mud banks backed by wooded area. Drift in mud bank area. Swift back current around boulder area. Summer--Submerged vegetation follows shoreline in mud bank area. 1.5-6.0 m deep.
B-9	R	Steep mud banks (4-6 m) backed by wooded area. Large amounts of drift in water. Two small creeks enter site. Summer--Band of submergent vegetation follows shoreline. 1.0-3.0 m deep.

Appendix 8-D (Continued)

Station-Site	Bank*	Description
B-10	R	Steep (3-5 m) banks backed by woods and agricultural field. Small amount of drift. One creek enters site (low flow). Summer--Heavily vegetated to water's edge. Narrow band of submergent vegetation follows shoreline. Mud substrate. 1.0-2.0 m deep.

*Denotes descending bank on which sample site is located (R = Right, L = Left).

APPENDIX 8-E

ELECTROFISHING SAMPLE DATES AND NUMBER OF SAMPLES FROM TWO STATIONS NEAR WATTS BAR NUCLEAR PLANT IN UPPER CHICKAMAUGA RESERVOIR FROM 1977-1986

Appendix 8-E. Electrofishing Sample Dates and Number of Samples from Two Stations Near Watts Bar Nuclear Plant in Upper Chickamauga Reservoir from 1977-1986.

	Sample Quarter	Sampling Dates	Number of Samples/Station TRM 528 Station A	TRM 524.5 Station B
1977				
	Spring	3/1	10	10
	Spring	5/13	10	10
	Summer	7/7	10	10
	Summer	8/24	10	10
	Fall	10/26	10	10
		Total Samples	50	50
1978				
	Winter	12/22/77	10	10
	Winter	2/27	10	10
	Spring	3/28	9	10
	Spring	4/28	10	10
	Spring	5/26	10	10
	Summer	6/21	10	10
	Summer	7/26	10	10
	Summer	8/31	10	10
	Fall	9/19	10	10
	Fall	10/25	10	10
	Fall	11/28	10	10
		Total Samples	109	110
1979				
	Winter	12/21/78	10	10
	Winter	1/31	10	10
	Winter	2/28	10	10
	Spring	3/21	10	10
	Spring	4/23	10	10
	Spring	5/30	10	10
	Summer	6/27	10	10
	Summer	7/31	10	10
	Summer	8/10	10	10
	Fall	9/7	10	10
	Fall	10/12	10	10
	Fall	11/16	10	10
		Total Samples	120	120

Appendix 8-E (Continued)

	Sample Quarter	Sampling Dates	Number of Samples/Station TRM 528 Station A	TRM 524.5 Station B
1982				
	Spring	3/23	10	10
	Spring	4/21	10	10
	Spring	5/18	10	10
	Summer	6/25	10	10
	Summer	7/28	10	10
	Summer	8/24	10	10
	Fall	9/16	10	10
	Fall	10/12	10	10
	Fall	11/19	10	10
		Total Samples	90	90
1983				
	Winter	12/15/82	10	10
	Winter	1/13	10	10
	Winter	2/9	10	10
	Spring	3/22	10	10
	Spring	4/15	10	10
	Spring	5/31	2	10
	Summer	6/29	10	10
	Summer	7/15	10	10
	Summer	8/24	10	10
	Fall	9/23	10	10
	Fall	10/6	10	10
	Fall	11/18	10	10
		Total Samples	112	120
1984				
	Winter	12/16/83	10	10
	Winter	1/19	10	10
	Winter	2/28	10	10
	Spring	3/23	10	10
	Spring	4/26	10	9
	Summer	6/14	10	9
	Summer	7/30	10	10
	Summer	8/23	10	10
	Fall	9/13	10	10
	Fall	10/19	10	10
	Fall	11/16	10	10
		Total Samples	110	108

Appendix 8-E (Continued)

	Sample Quarter	Sampling Dates	Number of Samples/Station TRM 528 Station A	TRM 524.5 Station B
1985				
	Winter	12/18/84	10	10
	Winter	1/18	10	10
	Winter	2/15	10	10
	Spring	3/15	10	10
	Spring	4/19	10	10
	Spring	5/16	10	10
	Summer	6/26	10	10
	Summer	7/16	10	10
	Summer	8/9	10	10
	Fall	9/19	0	10
	Fall	10/18	10	10
	Fall	11/15	10	10
		Total Samples	110	120
1986				
	Winter	12/16/85	10	10
		Total Samples 1977-1986		1439

APPENDIX 8-F

MEAN ANNUAL NUMBER PER HECTARE OF EACH FISH SPECIES
COLLECTED IN COVE ROTENONE SAMPLES FROM
CHICKAMAUGA RESERVOIR, 1970 THROUGH 1985,
NUMBER OF SAMPLES AT EACH LOCATION IN PARENTHESIS

Appendix 8-F. Mean Annual Number Per Hectare of Each Fish Species Collected in Cove Rotenone Samples From Chickamauga Reservoir, 1970 Through 1985, Number of Samples at Each Location in Parenthesis

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted gar	0.00	3.12	2.78	1.94	0.00	0.00	1.25	0.00	0.00	0.00
Longnose gar	2.22	0.87	2.75	1.06	0.00	14.29	2.66	0.00	0.00	0.00
Shortnose gar	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00
Skipjack herring	0.00	1.90	3.89	7.31	0.00	17.86	7.64	10.91	5.21	1.45
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	5,981.11	732.33	4,567.46	2,139.04	832.65	585.71	2,513.17	758.18	500.00	2,924.64
Threadfin shad	1,286.67	2,895.48	12,361.84	2,675.53	277.55	2,875.00	2,955.06	427.27	4,289.58	8,504.35
Mixed shad	0.00	558.75	0.00	10.28	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.00	0.32	0.00	0.11	0.00	0.00	0.13	3.64	0.00	0.00
Minnow,carp	0.00	26.19	0.00	9.48	0.00	0.00	49.68	0.00	0.00	0.00
Central stoneroller	0.00	0.27	0.38	1.31	0.00	0.00	6.37	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	1.04	0.00
Carp	0.00	13.58	20.33	8.81	4.08	0.00	6.95	1.82	8.33	1.45
Silver chub	0.00	0.48	0.00	0.58	0.00	0.00	1.88	0.00	0.00	0.00
Golden shiner	0.00	20.91	304.45	153.45	0.00	0.00	454.72	0.00	21.87	30.43
Unidentified shiner	0.00	0.00	0.79	0.32	0.00	0.00	14.70	0.00	0.00	0.00
Emerald shiner	0.00	66.54	1,227.56	155.59	0.00	0.00	115.48	0.00	0.00	0.00
Ghost shiner	0.00	0.00	0.53	0.00	0.00	0.00	0.60	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	3.57	0.00	0.00	11.82	0.00	0.00	0.00
Spotfin shiner	0.00	5.09	290.53	214.64	0.00	0.00	55.91	0.00	0.00	0.00
Mimic shiner	0.00	7.83	0.00	0.83	0.00	0.00	0.93	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	2.34	0.00	0.00	0.53	0.00	0.00	0.00
Pugnose minnow	0.00	0.21	0.26	3.69	0.00	0.00	6.15	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.53	0.00	0.00	0.00	2.19	0.00	0.00	0.00
Unidentified minnow	0.00	35.03	0.00	213.08	0.00	0.00	0.00	0.00	0.00	0.00
Bluntnose minnow	0.00	53.07	0.00	98.27	0.00	0.00	134.41	0.00	0.00	0.00

Appendix 8-F (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00
Bullhead minnow	0.00	393.05	231.26	1,381.21	0.00	0.00	438.10	0.00	0.00	0.00
River carpsucker	0.00	0.23	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	2.04	0.00	0.31	1.82	0.00	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00
Northern hogsucker	0.00	1.18	0.32	0.64	0.00	0.00	0.86	0.00	0.00	0.00
Unidentified buffalo	0.00	0.00	0.00	0.00	0.00	3.57	3.18	0.00	0.00	0.00
Smallmouth buffalo	63.33	15.29	1.11	9.95	34.69	0.00	8.87	14.55	51.04	42.03
Bigmouth buffalo	1.11	9.26	0.00	0.00	0.00	0.00	0.00	30.91	0.00	0.00
Black buffalo	0.00	0.11	0.00	0.00	2.04	0.00	0.00	0.00	0.00	0.00
Spotted sucker	1.11	31.54	5.77	14.83	0.00	175.00	20.27	1.82	21.87	8.70
Unidentified redhorse	0.00	0.00	0.00	0.00	0.00	0.00	3.03	10.91	0.00	1.45
Shorthead redhorse	0.00	0.11	0.00	0.00	0.00	3.57	0.94	0.00	0.00	0.00
River redhorse	0.00	0.11	0.00	0.06	0.00	0.00	0.13	0.00	0.00	0.00
Black redhorse	0.00	0.31	0.00	0.00	0.00	32.14	3.35	0.00	0.00	0.00
Golden redhorse	5.56	2.00	0.17	1.58	0.00	85.71	3.55	0.00	7.29	0.00
Blue catfish	0.00	0.00	0.51	1.61	0.00	0.00	0.38	10.91	57.29	0.00
Black bullhead	0.00	0.00	0.15	1.13	0.00	0.00	1.91	0.00	0.00	0.00
Yellow bullhead	0.00	0.00	1.06	1.45	0.00	0.00	21.93	0.00	0.00	0.00
Brown bullhead	0.00	0.00	2.12	0.84	0.00	0.00	0.28	0.00	0.00	0.00
Channel catfish	7.78	27.45	8.49	21.18	0.00	0.00	30.76	3.64	17.71	44.93
Flathead catfish	1.11	1.29	1.66	3.06	2.04	17.86	11.22	5.45	3.12	4.35
Killifish	0.00	0.00	0.00	0.00	0.00	0.00	38.64	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.00	0.00	0.00	4.93	0.00	0.00	0.00
Blackspotted topminnow	0.00	1.13	0.00	1.89	0.00	0.00	10.92	0.00	0.00	0.00
Mosquitofish	0.00	0.15	5.56	0.57	0.00	0.00	0.42	0.00	0.00	0.00
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White bass	15.56	2.19	7.45	2.00	8.16	3.57	23.58	0.00	26.04	43.48
Yellow bass	0.00	51.68	61.91	126.04	0.00	0.00	33.55	0.00	0.00	0.00

Appendix 8-F (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Rock bass	0.00	0.00	0.00	1.22	2.04	0.00	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	45.62	0.85	8.07	0.00	0.00	0.67	0.00	0.00	0.00
Warmouth	0.00	7.63	840.36	716.93	0.00	35.71	1,632.27	32.73	22.92	20.29
Redbreast sunfish	0.00	7.99	777.15	119.84	0.00	0.00	815.31	0.00	0.00	0.00
Green sunfish	0.00	2.60	101.55	81.65	2.04	39.29	54.36	30.91	54.17	0.00
Orangespotted sunfish	0.00	0.11	0.00	1.34	0.00	0.00	0.71	0.00	10.42	2.90
Bluegill	642.22	3,472.44	17,208.59	22,104.59	487.76	596.43	14,854.96	2,647.27	4,467.71	3,539.13
Longear sunfish	81.11	484.50	696.16	940.30	110.20	167.86	410.51	0.00	0.00	0.00
Redear sunfish	27.78	73.59	8,070.15	5,229.03	2.04	7.14	3,961.46	23.64	32.29	68.12
Hybrid sunfish	0.00	0.64	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Spotted bass	32.22	182.44	91.79	52.01	151.02	235.71	153.51	45.45	23.96	5.80
Largemouth bass	182.22	112.25	870.41	430.76	275.51	578.57	477.37	249.09	360.42	230.43
White crappie	1.11	41.59	14.11	35.64	4.08	3.57	93.09	16.36	120.83	91.30
Black crappie	0.00	1.68	1.13	4.17	0.00	10.71	2.64	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.06	0.00	0.00	0.13	0.00	0.00	0.00
Mud darter	0.00	7.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	4.76	0.62	0.30	0.00	0.00	0.36	0.00	0.00	0.00
Stripetail darter	0.00	0.15	1.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	34.44	21.04	101.34	70.52	6.12	82.14	226.26	0.00	3.12	1.45
Logperch	0.00	35.32	146.77	30.96	0.00	0.00	106.20	0.00	0.00	0.00
Sauger	0.00	0.26	0.23	0.48	0.00	0.00	3.18	3.64	0.00	0.00
Freshwater drum	194.44	349.02	127.50	184.54	177.55	317.86	209.85	192.73	725.00	755.07
Brook silverside	0.00	18.38	429.39	250.06	0.00	0.00	140.66	0.00	0.00	0.00
Mixed & unid minnows	1,168.89	177.06	28.44	240.06	522.45	332.14	185.11	394.55	2,657.29	872.46
Total	9,730.00	10,005.91	48,619.17	37,772.87	2,904.08	6,221.43	30,332.77	4,918.18	13,488.54	17,194.20

Appendix 8-F (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Chestnut lamprey	0.00	0.00	0.00	0.16	0.00
Paddlefish	0.00	0.00	0.00	0.00	1.18
Spotted gar	0.00	0.00	0.00	1.54	24.97
Longnose gar	0.00	0.00	0.00	3.70	3.89
Shortnose gar	0.00	0.00	0.00	0.00	2.77
Skipjack herring	5.56	21.43	14.81	15.42	2.64
Unidentified shad	0.00	0.00	0.00	0.00	24.24
Gizzard shad	2,400.00	978.57	4,192.59	2,316.52	10,276.04
Threadfin shad	12,055.56	250.00	607.41	5,677.49	2,483.76
Mixed shad	0.00	5,125.00	0.00	0.00	0.00
Mooneye	0.00	0.00	3.70	3.57	0.00
Minnow,carp	0.00	0.00	0.00	0.16	0.00
Central stoneroller	0.00	0.00	0.00	0.38	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00
Carp	22.22	0.00	11.11	21.81	33.71
Silver chub	0.00	0.00	0.00	4.30	0.00
Golden shiner	0.00	0.00	0.00	205.12	123.46
Unidentified shiner	0.00	0.00	0.00	0.79	21.83
Emerald shiner	0.00	0.00	0.00	34.28	15.42
Ghost shiner	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.30	0.00
Spotfin shiner	0.00	0.00	0.00	0.62	0.81
Mimic shiner	0.00	0.00	0.00	0.16	0.53
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	36.90	0.61
Bluntnose minnow	0.00	0.00	0.00	0.00	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00

Appendix 8-F (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Bullhead minnow	0.00	0.00	0.00	672.19	102.51
River carpsucker	0.00	0.00	0.00	1.91	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	1.56
White sucker	0.00	0.00	0.00	0.31	0.00
Northern hogsucker	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	32.14	0.00	0.00	0.00
Smallmouth buffalo	72.22	0.00	48.15	12.40	31.72
Bigmouth buffalo	0.00	0.00	0.00	0.00	0.34
Black buffalo	0.00	0.00	0.00	0.16	0.00
Spotted sucker	5.56	0.00	11.11	131.06	11.82
Unidentified redhorse	0.00	0.00	0.00	10.79	0.00
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00
River redhorse	0.00	0.00	0.00	1.29	0.00
Black redhorse	0.00	0.00	0.00	0.92	0.26
Golden redhorse	0.00	7.14	22.22	10.92	1.78
Blue catfish	0.00	0.00	0.00	1.75	2.14
Black bullhead	0.00	0.00	0.00	3.51	5.12
Yellow bullhead	0.00	0.00	0.00	76.74	0.88
Brown bullhead	0.00	0.00	0.00	1.30	1.63
Channel catfish	16.67	10.71	29.63	32.26	18.14
Flathead catfish	0.00	3.57	7.41	2.28	0.91
Killifish	0.00	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	8.68	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.00	0.00
Mosquitofish	0.00	0.00	0.00	6.24	16.04
Unidentified temperate bass	0.00	0.00	0.00	0.31	0.00
White bass	38.89	307.14	7.41	5.60	24.78
Yellow bass	0.00	0.00	0.00	79.01	300.30
Rock bass	0.00	0.00	0.00	0.00	0.00

Appendix 8-F (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Unidentified sunfish	0.00	0.00	0.00	5.27	0.00
Warmouth	5.56	3.57	29.63	1,246.05	255.47
Redbreast sunfish	0.00	0.00	0.00	170.11	2.15
Green sunfish	0.00	0.00	3.70	19.73	9.07
Orangespotted sunfish	16.67	3.57	7.41	12.95	0.00
Bluegill	1,372.22	832.14	1,133.33	6,094.16	817.19
Longear sunfish	0.00	10.71	0.00	15.21	0.45
Redear sunfish	38.89	42.86	66.67	1,911.90	104.58
Hybrid sunfish	0.00	0.00	0.00	0.12	0.00
Smallmouth bass	0.00	0.00	0.00	0.31	0.00
Spotted bass	111.11	128.57	233.33	95.27	15.70
Largemouth bass	155.56	407.14	359.26	332.35	49.49
White crappie	1,038.89	39.29	111.11	91.42	132.34
Black crappie	0.00	0.00	0.00	1.10	0.00
Unidentified darter	0.00	0.00	0.00	0.16	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00
Yellow perch	5.56	0.00	0.00	49.05	0.00
Logperch	0.00	0.00	0.00	40.26	0.22
Sauger	0.00	0.00	3.70	3.69	0.00
Freshwater drum	400.00	235.71	788.89	446.94	500.44
Brook silverside	0.00	0.00	0.00	20.62	23.27
Mixed & unid minnows	311.11	525.00	185.19	13.80	3.02
Total	18,072.22	8,964.29	7,877.78	19,953.28	15,449.15

APPENDIX 8-G

MEAN BIOMASS (KG/HA) OF EACH FISH SPECIES COLLECTED IN COVE ROTENONE SAMPLES FROM CHICKAMAUGA RESERVOIR, 1970 THROUGH 1985, NUMBER OF SAMPLES AT EACH LOCATION IN PARENTHESIS

Appendix 8-G. Mean Biomass (kg/ha) of Each Fish Species Collected in Cove Rotenone Samples From Chickamauga Reservoir, 1970 Through 1985, Number of Samples at Each Location in Parenthesis

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted gar	0.00	0.98	0.26	0.34	0.00	0.00	0.26	0.00	0.00	0.00
Longnose gar	0.33	0.45	0.09	0.05	0.00	0.04	0.06	0.00	0.00	0.00
Shortnose gar	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Skipjack herring	0.00	0.30	0.28	0.65	0.00	0.05	0.37	0.96	0.58	0.04
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	57.77	103.09	302.18	180.79	32.56	90.06	101.03	45.17	35.99	48.37
Threadfin shad	1.35	15.03	52.72	7.80	0.29	3.01	16.21	0.59	4.50	8.90
Mixed shad	0.00	1.20	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.00	0.01	0.00	0.02	0.00	0.00	0.03	0.04	0.00	0.00
Minnow,carp	0.00	0.01	0.00	0.01	0.00	0.00	0.06	0.00	0.00	0.00
Central stoneroller	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Carp	0.00	28.77	11.02	14.52	8.52	0.00	14.52	0.67	14.91	2.77
Silver chub	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Golden shiner	0.00	0.15	2.74	1.45	0.00	0.00	2.40	0.00	1.11	1.09
Unidentified shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Emerald shiner	0.00	0.14	1.49	0.24	0.00	0.00	0.15	0.00	0.00	0.00
Ghost shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00
Spotfin shiner	0.00	0.02	0.31	0.24	0.00	0.00	0.07	0.00	0.00	0.00
Mimic shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Unidentified minnow	0.00	0.08	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Bluntnose minnow	0.00	0.07	0.00	0.09	0.00	0.00	0.14	0.00	0.00	0.00

Appendix G-6 (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bullhead minnow	0.00	0.43	0.25	1.09	0.00	0.00	0.45	0.00	0.00	0.00
River carpsucker	0.00	0.36	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	2.41	0.00	0.32	1.87	0.00	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern hogsucker	0.00	0.47	0.07	0.08	0.00	0.00	0.12	0.00	0.00	0.00
Unidentified buffalo	0.00	0.00	0.00	0.00	0.00	6.07	5.04	0.00	0.00	0.00
Smallmouth buffalo	109.46	29.96	3.43	19.19	51.70	0.00	10.19	20.73	39.50	51.22
Bigmouth buffalo	4.26	17.36	0.00	0.00	0.00	0.00	0.00	54.21	0.00	0.00
Black buffalo	0.00	0.38	0.00	0.00	3.15	0.00	0.00	0.00	0.00	0.00
Spotted sucker	0.11	8.41	3.76	6.81	0.00	1.81	5.73	0.11	2.36	0.39
Unidentified redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.92	5.90	0.00	0.43
Shorthead redhorse	0.00	0.13	0.00	0.00	0.00	0.39	0.03	0.00	0.00	0.00
River redhorse	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
Black redhorse	0.00	0.13	0.00	0.00	0.00	12.54	1.02	0.00	0.00	0.00
Golden redhorse	1.28	1.43	0.09	0.82	0.00	19.99	1.19	0.00	3.20	0.00
Blue catfish	0.00	0.00	0.33	0.88	0.00	0.00	0.25	9.86	7.33	0.00
Black bullhead	0.00	0.00	0.02	0.00	0.00	0.00	0.08	0.00	0.00	0.00
Yellow bullhead	0.00	0.00	0.00	0.04	0.00	0.00	0.13	0.00	0.00	0.00
Brown bullhead	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Channel catfish	0.75	6.15	7.98	9.97	0.00	0.00	12.09	1.02	4.39	12.38
Flathead catfish	1.11	0.27	0.12	0.37	0.46	0.06	0.89	0.65	1.23	1.04
Killifish	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Mosquitofish	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White bass	0.12	0.01	0.10	0.15	0.02	0.00	0.45	0.00	0.17	0.46
Yellow bass	0.00	0.41	2.33	4.63	0.00	0.00	1.52	0.00	0.00	0.00

Appendix 8-G (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Rock bass	0.00	0.00	0.00	0.01	0.19	0.00	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Warmouth	0.00	0.35	2.53	2.42	0.00	0.39	2.99	0.15	0.42	0.67
Redbreast sunfish	0.00	0.02	0.85	0.14	0.00	0.00	0.80	0.00	0.00	0.00
Green sunfish	0.00	0.03	0.25	0.47	0.01	0.60	0.13	0.63	0.30	0.00
Orangespotted sunfish	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.09	0.02
Bluegill	8.13	21.46	39.41	44.78	4.18	9.98	29.56	9.47	25.44	17.27
Longear sunfish	1.00	3.67	3.62	3.42	1.46	2.18	2.58	0.00	0.00	0.00
Redear sunfish	2.77	4.84	12.09	12.74	0.09	1.07	13.92	1.89	2.10	4.31
Hybrid sunfish	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted bass	0.24	1.52	0.64	0.64	1.10	0.90	0.79	0.16	0.11	0.01
Largemouth bass	4.15	4.65	14.48	13.12	9.38	2.13	8.45	2.35	6.10	8.40
White crappie	0.00	1.43	0.62	1.08	0.68	0.00	1.78	1.17	5.00	4.92
Black crappie	0.00	0.13	0.07	0.12	0.00	1.15	0.25	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	0.25	0.49	1.61	1.33	0.02	0.33	2.64	0.00	0.10	0.07
Logperch	0.00	0.36	0.91	0.22	0.00	0.00	0.67	0.00	0.00	0.00
Sauger	0.00	0.07	0.02	0.08	0.00	0.00	0.27	1.40	0.00	0.00
Freshwater drum	16.48	16.49	11.68	17.84	17.05	29.22	19.12	10.48	44.93	79.95
Brook silverside	0.00	0.03	0.42	0.31	0.00	0.00	0.15	0.00	0.00	0.00
Mixed & unid minnows	1.17	0.29	0.00	0.48	0.73	0.71	0.21	0.39	2.66	0.87
Total	210.71	272.18	478.81	349.70	133.99	182.67	260.31	169.88	202.54	243.59

Appendix 8-G (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.63
Spotted gar	0.00	0.00	0.00	0.40	14.56
Longnose gar	0.00	0.00	0.00	0.10	0.66
Shortnose gar	0.00	0.00	0.00	0.00	1.45
Skipjack herring	0.04	1.79	1.65	1.04	0.05
Unidentified shad	0.00	0.00	0.00	0.00	0.01
Gizzard shad	214.59	113.91	115.41	143.09	66.02
Threadfin shad	12.62	0.26	0.77	27.21	4.83
Mixed shad	0.00	5.52	0.00	0.00	0.00
Mooneye	0.00	0.00	0.01	0.06	0.00
Minnow,carp	0.00	0.00	0.00	0.00	0.00
Central stoneroller	0.00	0.00	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00
Carp	26.23	0.00	17.36	34.15	72.08
Silver chub	0.00	0.00	0.00	0.09	0.00
Golden shiner	0.00	0.00	0.00	2.62	0.25
Unidentified shiner	0.00	0.00	0.00	0.00	0.02
Emerald shiner	0.00	0.00	0.00	0.13	0.02
Ghost shiner	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.00	0.00
Spotfin shiner	0.00	0.00	0.00	0.00	0.00
Mimic shiner	0.00	0.00	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	0.05	0.00
Bluntnose minnow	0.00	0.00	0.00	0.00	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00

Appendix 8-G (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Bullhead minnow	0.00	0.00	0.00	0.77	0.06
River carpsucker	0.00	0.00	0.00	0.08	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	0.02
White sucker	0.00	0.00	0.00	0.01	0.00
Northern hogsucker	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	25.71	0.00	0.00	0.00
Smallmouth buffalo	82.71	0.00	49.01	14.15	23.69
Bigmouth buffalo	0.00	0.00	0.00	0.00	0.95
Black buffalo	0.00	0.00	0.00	0.49	0.00
Spotted sucker	0.02	0.00	0.04	16.37	6.44
Unidentified redhorse	0.00	0.00	0.00	0.15	0.00
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00
River redhorse	0.00	0.00	0.00	0.68	0.00
Black redhorse	0.00	0.00	0.00	0.49	0.19
Golden redhorse	0.00	5.07	10.92	3.46	1.26
Blue catfish	0.00	0.00	0.00	1.28	0.25
Black bullhead	0.00	0.00	0.00	0.19	0.12
Yellow bullhead	0.00	0.00	0.00	0.64	0.00
Brown bullhead	0.00	0.00	0.00	0.26	0.59
Channel catfish	1.57	0.24	7.20	22.89	7.22
Flathead catfish	0.00	0.00	2.36	0.95	0.52
Killifish	0.00	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.04	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.00	0.00
Mosquitofish	0.00	0.00	0.00	0.01	0.02
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00
White bass	0.10	1.47	0.03	0.30	0.24
Yellow bass	0.00	0.00	0.00	1.20	2.00
Rock bass	0.00	0.00	0.00	0.00	0.00

Appendix 8-G (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Unidentified sunfish	0.00	0.00	0.00	0.01	0.00
Warmouth	0.20	0.06	1.11	3.06	0.62
Redbreast sunfish	0.00	0.00	0.00	0.26	0.03
Green sunfish	0.00	0.00	0.07	0.29	0.10
Orangespotted sunfish	0.19	0.02	0.04	0.04	0.00
Bluegill	23.11	8.94	26.81	31.28	4.99
Longear sunfish	0.00	0.06	0.00	0.21	0.01
Redear sunfish	2.06	1.62	2.74	11.99	2.43
Hybrid sunfish	0.00	0.00	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00
Spotted bass	0.17	0.16	0.28	0.31	0.06
Largemouth bass	6.29	9.28	14.28	14.03	3.58
White crappie	29.59	0.61	4.10	3.68	1.50
Black crappie	0.00	0.00	0.00	0.01	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00
Yellow perch	0.02	0.00	0.00	0.46	0.00
Logperch	0.00	0.00	0.00	0.18	0.00
Sauger	0.00	0.00	0.79	0.57	0.00
Freshwater drum	31.69	10.75	50.51	31.58	51.87
Brook silverside	0.00	0.00	0.00	0.02	0.02
Mixed & unid minnows	0.29	1.12	0.19	0.05	0.00
Total	431.49	186.60	305.68	371.38	269.38

APPENDIX 8-H

PERCENTAGE COMPOSITION (BASED ON MEAN NUMBER PER HECTARE) OF FISH SPECIES COLLECTED IN ROTENONE SAMPLES FROM CHICKAMAUGA RESERVOIR, 1970 THROUGH 1985, NUMBER OF SAMPLES AT EACH LOCATION IN PARENTHESIS

Appendix 8-H. Percentage Composition (Based on Mean Number Per Hectare) of Fish Species Collected in Rotenone Samples From Chickamauga Reservoir, 1970 Through 1985, Number of Samples at Each Location in Parenthesis

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted gar	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Longnose gar	0.02	0.01	0.01	0.00	0.00	0.23	0.01	0.00	0.00	0.00
Shortnose gar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skipjack herring	0.00	0.02	0.01	0.02	0.00	0.29	0.03	0.22	0.04	0.01
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	61.47	7.32	9.39	5.66	28.67	9.41	8.29	15.42	3.71	17.01
Threadfin shad	13.22	28.94	25.43	7.08	9.56	46.21	9.74	8.69	31.80	49.46
Mixed shad	0.00	5.58	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
Minnow,carp	0.00	0.26	0.00	0.03	0.00	0.00	0.16	0.00	0.00	0.00
Central stoneroller	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Carp	0.00	0.14	0.04	0.02	0.14	0.00	0.02	0.04	0.06	0.01
Silver chub	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Golden shiner	0.00	0.21	0.63	0.41	0.00	0.00	1.50	0.00	0.16	0.18
Unidentified shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Emerald shiner	0.00	0.66	2.52	0.41	0.00	0.00	0.38	0.00	0.00	0.00
Ghost shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00
Spotfin shiner	0.00	0.05	0.60	0.57	0.00	0.00	0.18	0.00	0.00	0.00
Mimic shiner	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Unidentified minnow	0.00	0.35	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Bluntnose minnow	0.00	0.53	0.00	0.26	0.00	0.00	0.44	0.00	0.00	0.00

Appendix 8-H (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bullhead minnow	0.00	3.93	0.48	3.66	0.00	0.00	1.44	0.00	0.00	0.00
River carpsucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.04	0.00	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern hogsucker	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.00	0.00	0.00
Smallmouth buffalo	0.65	0.15	0.00	0.03	1.19	0.00	0.03	0.30	0.38	0.24
Bigmouth buffalo	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00
Black buffalo	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
Spotted sucker	0.01	0.32	0.01	0.04	0.00	2.81	0.07	0.04	0.16	0.05
Unidentified redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.22	0.00	0.01
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
River redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black redhorse	0.00	0.00	0.00	0.00	0.00	0.52	0.01	0.00	0.00	0.00
Golden redhorse	0.06	0.02	0.00	0.00	0.00	1.38	0.01	0.00	0.05	0.00
Blue catfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.42	0.00
Black bullhead	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Yellow bullhead	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
Brown bullhead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Channel catfish	0.08	0.27	0.02	0.06	0.00	0.00	0.10	0.07	0.13	0.26
Flathead catfish	0.01	0.01	0.00	0.01	0.07	0.29	0.04	0.11	0.02	0.03
Killifish	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Blackspotted topminnow	0.00	0.01	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00
Mosquitofish	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White bass	0.16	0.02	0.02	0.01	0.28	0.06	0.08	0.00	0.19	0.25
Yellow bass	0.00	0.52	0.13	0.33	0.00	0.00	0.11	0.00	0.00	0.00
Rock bass	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00

Appendix 8-H (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Unidentified sunfish	0.00	0.46	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Warmouth	0.00	0.08	1.73	1.90	0.00	0.57	5.38	0.67	0.17	0.12
Redbreast sunfish	0.00	0.08	1.60	0.32	0.00	0.00	2.69	0.00	0.00	0.00
Green sunfish	0.00	0.03	0.21	0.22	0.07	0.63	0.18	0.63	0.40	0.00
Orangespotted sunfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.02
Bluegill	6.60	34.70	35.39	58.52	16.80	9.59	48.97	53.83	33.12	20.58
Longear sunfish	0.83	4.84	1.43	2.49	3.79	2.70	1.35	0.00	0.00	0.00
Redear sunfish	0.29	0.74	16.60	13.84	0.07	0.11	13.06	0.48	0.24	0.40
Hybrid sunfish	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted bass	0.33	1.82	0.19	0.14	5.20	3.79	0.51	0.92	0.18	0.03
Largemouth bass	1.87	1.12	1.79	1.14	9.49	9.30	1.57	5.06	2.67	1.34
White crappie	0.01	0.42	0.03	0.09	0.14	0.06	0.31	0.33	0.90	0.53
Black crappie	0.00	0.02	0.00	0.01	0.00	0.17	0.01	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	0.35	0.21	0.21	0.19	0.21	1.32	0.75	0.00	0.02	0.01
Logperch	0.00	0.35	0.30	0.08	0.00	0.00	0.35	0.00	0.00	0.00
Sauger	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.00
Freshwater drum	2.00	3.49	0.26	0.49	6.11	5.11	0.69	3.92	5.37	4.39
Brook silverside	0.00	0.18	0.88	0.66	0.00	0.00	0.46	0.00	0.00	0.00
Mixed & unid minnows	12.01	1.77	0.06	0.64	17.99	5.34	0.61	8.02	19.70	5.07
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Appendix 8-H (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.01
Spotted gar	0.00	0.00	0.00	0.01	0.16
Longnose gar	0.00	0.00	0.00	0.02	0.03
Shortnose gar	0.00	0.00	0.00	0.00	0.02
Skipjack herring	0.03	0.24	0.19	0.08	0.02
Unidentified shad	0.00	0.00	0.00	0.00	0.16
Gizzard shad	13.28	10.92	53.22	11.61	66.52
Threadfin shad	66.71	2.79	7.71	28.45	16.08
Mixed shad	0.00	57.17	0.00	0.00	0.00
Mooneye	0.00	0.00	0.05	0.02	0.00
Minnow,carp	0.00	0.00	0.00	0.00	0.00
Central stoneroller	0.00	0.00	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00
Carp	0.12	0.00	0.14	0.11	0.22
Silver chub	0.00	0.00	0.00	0.02	0.00
Golden shiner	0.00	0.00	0.00	1.03	0.80
Unidentified shiner	0.00	0.00	0.00	0.00	0.14
Emerald shiner	0.00	0.00	0.00	0.17	0.10
Ghost shiner	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.00	0.00
Spotfin shiner	0.00	0.00	0.00	0.00	0.01
Mimic shiner	0.00	0.00	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	0.18	0.00
Bluntnose minnow	0.00	0.00	0.00	0.00	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00

Appendix 8-H (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Unidentified redhorse	0.00	0.00	0.00	0.05	0.00
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00
River redhorse	0.00	0.00	0.00	0.01	0.00
Black redhorse	0.00	0.00	0.00	0.00	0.00
Golden redhorse	0.00	0.08	0.28	0.05	0.01
Blue catfish	0.00	0.00	0.00	0.01	0.01
Black bullhead	0.00	0.00	0.00	0.02	0.03
Yellow bullhead	0.00	0.00	0.00	0.38	0.01
Brown bullhead	0.00	0.00	0.00	0.01	0.01
Channel catfish	0.09	0.12	0.38	0.16	0.12
Flathead catfish	0.00	0.04	0.09	0.01	0.01
Killifish	0.00	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.04	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.00	0.00
Mosquitofish	0.00	0.00	0.00	0.03	0.10
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00
White bass	0.22	3.43	0.09	0.03	0.16
Yellow bass	0.00	0.00	0.00	0.40	1.94
Rock bass	0.00	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	0.00	0.00	0.03	0.00
Warmouth	0.03	0.04	0.38	6.24	1.65
Redbreast sunfish	0.00	0.00	0.00	0.85	0.01
Green sunfish	0.00	0.00	0.05	0.10	0.06
Orangespotted sunfish	0.09	0.04	0.09	0.06	0.00
Bluegill	7.59	9.28	14.39	30.54	5.29
Longear sunfish	0.00	0.12	0.00	0.08	0.00
Redear sunfish	0.22	0.48	0.85	9.58	0.68
Hybrid sunfish	0.00	0.00	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00

Appendix 8-H (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Spotted bass	0.61	1.43	2.96	0.48	0.10
Largemouth bass	0.86	4.54	4.56	1.67	0.32
White crappie	5.75	0.44	1.41	0.46	0.86
Black crappie	0.00	0.00	0.00	0.01	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00
Bullhead minnow	0.00	0.00	0.00	3.37	0.66
River carpsucker	0.00	0.00	0.00	0.01	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	0.01
White sucker	0.00	0.00	0.00	0.00	0.00
Northern hogsucker	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	0.36	0.00	0.00	0.00
Smallmouth buffalo	0.40	0.00	0.61	0.06	0.21
Bigmouth buffalo	0.00	0.00	0.00	0.00	0.00
Black buffalo	0.00	0.00	0.00	0.00	0.00
Spotted sucker	0.03	0.00	0.14	0.66	0.08
Yellow perch	0.03	0.00	0.00	0.25	0.00
Logperch	0.00	0.00	0.00	0.20	0.00
Sauger	0.00	0.00	0.05	0.02	0.00
Freshwater drum	2.21	2.63	10.01	2.24	3.24
Brook silverside	0.00	0.00	0.00	0.10	0.15
Mixed & unid minnows	1.72	5.86	2.35	0.07	0.02
Total	100.00	100.00	100.00	100.00	100.00

APPENDIX 8-I

PERCENTAGE OCCURRENCE (FREQUENCY) OF FISH SPECIES COLLECTED IN COVE ROTENONE SAMPLES FROM CHICKAMAUGA RESERVOIR, 1970 THROUGH 1985, NUMBER OF SAMPLES AT EACH LOCATION IN PARENTHESIS

Appendix 8-1. Percentage Occurrence (Frequency) of Fish Species Collected in Cove Rotenone Samples From Chickamauga Reservoir, 1970 Through 1985, Number of Samples at Each Location in Parenthesis

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted gar	0.00	42.86	33.33	25.00	0.00	0.00	31.25	0.00	0.00	0.00
Longnose gar	100.00	57.14	55.56	37.50	0.00	100.00	37.50	0.00	0.00	0.00
Shortnose gar	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00
Skipjack herring	0.00	57.14	55.56	56.25	0.00	100.00	68.75	100.00	100.00	100.00
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Threadfin shad	100.00	100.00	88.89	100.00	100.00	100.00	87.50	100.00	100.00	100.00
Mixed shad	0.00	14.29	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.00	14.29	0.00	6.25	0.00	0.00	12.50	100.00	0.00	0.00
Minnow,carp	0.00	14.29	0.00	12.50	0.00	0.00	18.75	0.00	0.00	0.00
Central stoneroller	0.00	28.57	11.11	25.00	0.00	0.00	50.00	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	100.00	0.00
Carp	0.00	100.00	77.78	62.50	100.00	0.00	81.25	100.00	100.00	100.00
Silver chub	0.00	28.57	0.00	6.25	0.00	0.00	25.00	0.00	0.00	0.00
Golden shiner	0.00	42.86	100.00	68.75	0.00	0.00	62.50	0.00	100.00	100.00
Unidentified shiner	0.00	0.00	11.11	12.50	0.00	0.00	12.50	0.00	0.00	0.00
Emerald shiner	0.00	71.43	88.89	62.50	0.00	0.00	68.75	0.00	0.00	0.00
Ghost shiner	0.00	0.00	11.11	0.00	0.00	0.00	6.25	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	6.25	0.00	0.00	25.00	0.00	0.00	0.00
Spotfin shiner	0.00	28.57	66.67	68.75	0.00	0.00	62.50	0.00	0.00	0.00
Mimic shiner	0.00	14.29	0.00	18.75	0.00	0.00	6.25	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	6.25	0.00	0.00	6.25	0.00	0.00	0.00
Pugnose minnow	0.00	14.29	11.11	6.25	0.00	0.00	25.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	11.11	0.00	0.00	0.00	18.75	0.00	0.00	0.00
Unidentified minnow	0.00	14.29	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00
Bluntnose minnow	0.00	28.57	0.00	18.75	0.00	0.00	6.25	0.00	0.00	0.00

Appendix B-1 (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00
Bullhead minnow	0.00	71.43	88.89	81.25	0.00	0.00	68.75	0.00	0.00	0.00
River carpsucker	0.00	28.57	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	100.00	0.00	6.25	100.00	0.00	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00
Northern hogsucker	0.00	42.86	22.22	31.25	0.00	0.00	25.00	0.00	0.00	0.00
Unidentified buffalo	0.00	0.00	0.00	0.00	0.00	100.00	6.25	0.00	0.00	0.00
Smallmouth buffalo	100.00	85.71	55.56	68.75	100.00	0.00	68.75	100.00	100.00	100.00
Bigmouth buffalo	100.00	28.57	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Black buffalo	0.00	14.29	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
Spotted sucker	100.00	85.71	66.67	81.25	0.00	100.00	100.00	100.00	100.00	100.00
Unidentified redhorse	0.00	0.00	0.00	0.00	0.00	0.00	31.25	100.00	0.00	100.00
Shorthead redhorse	0.00	14.29	0.00	0.00	0.00	100.00	12.50	0.00	0.00	0.00
River redhorse	0.00	14.29	0.00	6.25	0.00	0.00	6.25	0.00	0.00	0.00
Black redhorse	0.00	14.29	0.00	0.00	0.00	100.00	31.25	0.00	0.00	0.00
Golden redhorse	100.00	85.71	11.11	56.25	0.00	100.00	37.50	0.00	100.00	0.00
Blue catfish	0.00	0.00	11.11	25.00	0.00	0.00	12.50	100.00	100.00	0.00
Black bullhead	0.00	0.00	11.11	6.25	0.00	0.00	12.50	0.00	0.00	0.00
Yellow bullhead	0.00	0.00	11.11	18.75	0.00	0.00	50.00	0.00	0.00	0.00
Brown bullhead	0.00	0.00	22.22	12.50	0.00	0.00	6.25	0.00	0.00	0.00
Channel catfish	100.00	100.00	88.89	100.00	0.00	0.00	100.00	100.00	100.00	100.00
Flathead catfish	100.00	85.71	44.44	62.50	100.00	100.00	87.50	100.00	100.00	100.00
Killifish	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00
Blackspotted topminnow	0.00	28.57	0.00	12.50	0.00	0.00	68.75	0.00	0.00	0.00
Mosquitofish	0.00	14.29	11.11	6.25	0.00	0.00	12.50	0.00	0.00	0.00
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White bass	100.00	42.86	22.22	25.00	100.00	100.00	37.50	0.00	100.00	100.00
Yellow bass	0.00	85.71	77.78	75.00	0.00	0.00	87.50	0.00	0.00	0.00

Appendix 8-1 (Continued)

Species	475.2 (1)	475.7 (7)	476.2 (9)	478.0 (16)	484.7 (1)	492.6 (1)	495.0 (16)	1.2 (1)	2.5 (1)	3.5 (1)
Rock bass	0.00	0.00	0.00	6.25	100.00	0.00	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	14.29	11.11	31.25	0.00	0.00	18.75	0.00	0.00	0.00
Warmouth	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	100.00	100.00
Redbreast sunfish	0.00	14.29	44.44	12.50	0.00	0.00	37.50	0.00	0.00	0.00
Green sunfish	0.00	57.14	77.78	87.50	100.00	100.00	68.75	100.00	100.00	0.00
Orangespotted sunfish	0.00	14.29	0.00	25.00	0.00	0.00	25.00	0.00	100.00	100.00
Bluegill	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Longear sunfish	100.00	100.00	100.00	100.00	100.00	100.00	93.75	0.00	0.00	0.00
Redear sunfish	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Hybrid sunfish	0.00	14.29	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	18.75	0.00	0.00	0.00	0.00	0.00	0.00
Spotted bass	100.00	100.00	100.00	87.50	100.00	100.00	93.75	100.00	100.00	100.00
Largemouth bass	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
White crappie	100.00	100.00	77.78	87.50	100.00	100.00	100.00	100.00	100.00	100.00
Black crappie	0.00	28.57	22.22	31.25	0.00	100.00	31.25	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	6.25	0.00	0.00	6.25	0.00	0.00	0.00
Mud darter	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	14.29	22.22	12.50	0.00	0.00	6.25	0.00	0.00	0.00
Stripetail darter	0.00	14.29	33.33	6.25	0.00	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	100.00	100.00	100.00	87.50	100.00	100.00	100.00	0.00	100.00	100.00
Logperch	0.00	85.71	100.00	75.00	0.00	0.00	100.00	0.00	0.00	0.00
Sauger	0.00	28.57	11.11	25.00	0.00	0.00	50.00	100.00	0.00	0.00
Freshwater drum	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Brook silverside	0.00	85.71	100.00	81.25	0.00	0.00	93.75	0.00	0.00	0.00
Mixed & unid minnows	100.00	28.57	22.22	43.75	100.00	100.00	31.25	100.00	100.00	100.00
Total	1,900.00	2,942.86	2,588.89	2,718.75	1,900.00	2,300.00	3,093.75	2,300.00	2,400.00	2,100.00

Appendix B-1 (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Chestnut lamprey	0.00	0.00	0.00	6.67	0.00
Paddlefish	0.00	0.00	0.00	0.00	30.00
Spotted gar	0.00	0.00	0.00	33.33	60.00
Longnose gar	0.00	0.00	0.00	46.67	60.00
Shortnose gar	0.00	0.00	0.00	0.00	40.00
Skipjack herring	100.00	100.00	100.00	60.00	50.00
Unidentified shad	0.00	0.00	0.00	0.00	10.00
Gizzard shad	100.00	100.00	100.00	100.00	100.00
Threadfin shad	100.00	100.00	100.00	86.67	90.00
Mixed shad	0.00	100.00	0.00	0.00	0.00
Mooneye	0.00	0.00	100.00	13.33	0.00
Minnow,carp	0.00	0.00	0.00	6.67	0.00
Central stoneroller	0.00	0.00	0.00	13.33	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00
Carp	100.00	0.00	100.00	100.00	90.00
Silver chub	0.00	0.00	0.00	13.33	0.00
Golden shiner	0.00	0.00	0.00	100.00	90.00
Unidentified shiner	0.00	0.00	0.00	13.33	30.00
Emerald shiner	0.00	0.00	0.00	53.33	70.00
Ghost shiner	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	13.33	0.00
Spotfin shiner	0.00	0.00	0.00	13.33	20.00
Mimic shiner	0.00	0.00	0.00	6.67	20.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	6.67	10.00
Bluntnose minnow	0.00	0.00	0.00	0.00	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00

Appendix 8-I (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Bullhead minnow	0.00	0.00	0.00	86.67	80.00
River carpsucker	0.00	0.00	0.00	13.33	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	10.00
White sucker	0.00	0.00	0.00	6.67	0.00
Northern hogsucker	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	100.00	0.00	0.00	0.00
Smallmouth buffalo	100.00	0.00	100.00	60.00	60.00
Bigmouth buffalo	0.00	0.00	0.00	0.00	10.00
Black buffalo	0.00	0.00	0.00	6.67	0.00
Spotted sucker	100.00	0.00	100.00	100.00	80.00
Unidentified redhorse	0.00	0.00	0.00	6.67	0.00
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00
River redhorse	0.00	0.00	0.00	6.67	0.00
Black redhorse	0.00	0.00	0.00	20.00	10.00
Golden redhorse	0.00	100.00	100.00	60.00	20.00
Blue catfish	0.00	0.00	0.00	13.33	20.00
Black bullhead	0.00	0.00	0.00	26.67	10.00
Yellow bullhead	0.00	0.00	0.00	53.33	30.00
Brown bullhead	0.00	0.00	0.00	6.67	10.00
Channel catfish	100.00	100.00	100.00	93.33	90.00
Flathead catfish	0.00	100.00	100.00	60.00	20.00
Killifish	0.00	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	6.67	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.00	0.00
Mosquitofish	0.00	0.00	0.00	46.67	70.00
Unidentified temperate bass	0.00	0.00	0.00	6.67	0.00
White bass	100.00	100.00	100.00	46.67	40.00
Yellow bass	0.00	0.00	0.00	93.33	100.00
Rock bass	0.00	0.00	0.00	0.00	0.00

Appendix B-1 (Continued)

Species	505.4 (1)	506.0 (1)	507.3 (1)	508.0 (15)	524.6 (10)
Unidentified sunfish	0.00	0.00	0.00	6.67	0.00
Warmouth	100.00	100.00	100.00	100.00	80.00
Redbreast sunfish	0.00	0.00	0.00	46.67	20.00
Green sunfish	0.00	0.00	100.00	80.00	70.00
Orangespotted sunfish	100.00	100.00	100.00	33.33	0.00
Bluegill	100.00	100.00	100.00	100.00	100.00
Longear sunfish	0.00	100.00	0.00	53.33	20.00
Redear sunfish	100.00	100.00	100.00	100.00	80.00
Hybrid sunfish	0.00	0.00	0.00	6.67	0.00
Smallmouth bass	0.00	0.00	0.00	6.67	0.00
Spotted bass	100.00	100.00	100.00	86.67	50.00
Largemouth bass	100.00	100.00	100.00	100.00	90.00
White crappie	100.00	100.00	100.00	100.00	100.00
Black crappie	0.00	0.00	0.00	20.00	0.00
Unidentified darter	0.00	0.00	0.00	6.67	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00
Yellow perch	100.00	0.00	0.00	73.33	0.00
Logperch	0.00	0.00	0.00	60.00	10.00
Sauger	0.00	0.00	100.00	46.67	0.00
Freshwater drum	100.00	100.00	100.00	100.00	100.00
Brook silverside	0.00	0.00	0.00	93.33	60.00
Mixed & unid minnows	100.00	100.00	100.00	6.67	10.00
Total	1,800.00	1,900.00	2,200.00	2,733.33	2,220.00

APPENDIX 8-J

MEAN ANNUAL NUMBER PER HECTARE OF EACH FISH SPECIES
COLLECTED IN COVE ROTENONE SAMPLES FROM
CHICKAMAUGA RESERVOIR, 1970 THROUGH 1985,
NUMBER OF SAMPLES EACH YEAR IN PARENTHESIS

Appendix 8-J. Mean Annual Number Per Hectare of Each Fish Species Collected in Cove Rotenone Samples From Chickamauga Reservoir, 1970 Through 1985, Number of Samples Each Year in Parenthesis

Species	70 (12)	71 (4)	72 (4)	73 (4)	74 (4)	75 (4)	76 (5)	77 (5)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21
Spotted gar	1.69	0.27	0.00	0.20	0.46	1.19	12.12	2.89
Longnose gar	1.70	0.00	0.40	0.20	0.40	0.26	0.43	1.21
Shortnose gar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82
Skipjack herring	8.89	0.00	13.75	25.50	6.98	2.39	3.50	5.57
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	48.48	0.00
Gizzard shad	1,775.08	890.94	836.87	1,035.63	917.56	1,055.64	1,985.21	9,552.49
Threadfin shad	2,732.99	3,351.72	8,146.51	7,254.21	6,919.78	4,029.94	3,401.95	1,566.42
Mixed shad	766.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.80	0.00	0.00	0.85	0.27	0.00	0.36	10.23
Minnow,carp	0.00	0.00	0.00	233.20	0.00	20.43	0.00	23.55
Central stoneroller	0.00	0.00	0.00	0.46	0.27	0.00	1.49	2.74
Goldfish	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carp	5.77	27.66	14.66	21.49	8.79	12.65	22.37	14.26
Silver chub	0.00	0.00	0.00	0.00	2.86	3.79	14.90	0.00
Golden shiner	4.36	0.58	6.98	13.26	5.81	12.25	87.29	363.21
Unidentified shiner	0.00	0.00	0.00	0.77	0.00	48.06	1.21	0.00
Emerald shiner	0.00	0.00	72.46	132.95	4.33	54.04	80.75	191.63
Ghost shiner	0.00	0.00	0.00	0.00	2.42	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.81
Spotfin shiner	0.00	0.00	0.00	6.21	3.63	11.84	212.04	114.59
Mimic shiner	0.00	0.00	0.00	0.00	0.00	0.00	14.66	1.64
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00	0.00	9.20	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	5.91	1.61	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	1,052.00	0.00	0.00	0.00	1.21

Appendix B-J (Continued)

Species	70 (12)	71 (4)	72 (4)	73 (4)	74 (4)	75 (4)	76 (5)	77 (5)
Bluntnose minnow	0.00	0.00	1,011.66	0.00	0.00	0.00	0.65	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bullhead minnow	0.00	1.05	72.67	0.65	734.76	3,397.45	1,974.17	418.03
River carpsucker	0.00	0.00	0.20	0.20	0.00	0.00	2.79	0.00
Quillback carpsucker	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
Northern hogsucker	0.00	0.54	0.99	0.79	0.00	0.26	2.07	1.03
Unidentified buffalo	7.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smallmouth buffalo	28.28	36.63	37.69	24.34	6.40	8.96	13.02	11.64
Bigmouth buffalo	8.01	0.00	0.00	0.00	0.00	0.19	0.00	0.00
Black buffalo	0.17	0.78	0.00	0.00	0.00	0.00	0.00	0.00
Spotted sucker	19.17	29.92	59.85	187.14	88.97	41.42	53.55	44.26
Unidentified redhorse	1.03	4.30	2.69	2.15	0.00	42.90	0.00	0.00
Shorthead redhorse	0.30	0.20	0.00	0.54	0.00	0.00	0.00	2.56
River redhorse	0.00	0.00	0.74	0.00	0.26	0.00	0.00	0.00
Black redhorse	4.18	0.00	2.55	0.00	0.00	0.00	6.47	1.03
Golden redhorse	12.13	12.28	5.19	5.30	13.73	1.51	3.50	12.16
Blue catfish	5.68	0.00	3.75	0.52	0.00	1.80	3.03	0.00
Black bullhead	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Yellow bullhead	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
Brown bullhead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Channel catfish	19.07	33.91	36.57	42.98	12.14	13.69	25.56	19.44
Flathead catfish	5.30	5.27	3.49	5.91	3.14	3.20	2.70	5.70
Killifish	0.00	0.00	0.00	154.57	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	32.56	0.00	0.00	0.00	14.47	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.20	4.21	1.08	6.81	7.25
Mosquitofish	0.00	0.00	1.74	2.33	0.00	0.00	16.85	0.61
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix 8-J (Continued)

Species	70 (12)	71 (4)	72 (4)	73 (4)	74 (4)	75 (4)	76 (5)	77 (5)
White bass	47.42	4.07	3.57	16.42	3.46	0.27	5.72	38.27
Yellow bass	0.00	1.18	22.70	21.30	8.55	33.39	60.67	247.91
Rock bass	0.17	0.00	0.00	4.90	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	0.00	0.00	0.27	0.00	6.73	78.36	2.29
Warmouth	13.92	48.27	55.18	213.51	13.68	45.77	72.57	249.60
Redbreast sunfish	0.00	0.00	0.00	0.00	0.00	0.00	17.90	1.82
Green sunfish	12.73	8.75	5.17	22.38	2.50	0.60	2.61	9.01
Orangespotted sunfish	3.41	5.70	10.17	35.27	0.58	0.26	0.00	0.00
Bluegill	1,506.60	2,110.00	2,962.87	2,775.94	1,849.74	4,419.62	6,674.38	19,668.26
Longear sunfish	74.21	186.37	254.34	374.69	398.92	537.07	1,061.16	589.96
Redear sunfish	40.97	139.14	149.09	694.98	190.86	240.66	344.09	979.08
Hybrid sunfish	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00	0.00	0.36	1.14
Spotted bass	151.86	86.65	123.28	55.87	82.34	76.91	135.17	41.84
Largemouth bass	295.09	121.20	96.68	162.46	67.08	106.74	86.92	399.64
White crappie	126.66	39.54	55.68	55.90	9.88	13.25	48.88	90.75
Black crappie	0.89	0.00	2.18	0.00	0.00	0.75	0.00	3.08
Unidentified darter	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00
Mud darter	0.00	0.00	12.90	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.77	0.00	7.02	0.82
Stripetail darter	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.98
Orangethroat darter	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
Yellow perch	16.94	33.03	32.25	23.41	8.30	4.36	32.19	147.65
Logperch	0.27	1.05	45.25	94.99	23.13	19.70	47.79	161.67
Sauger	0.75	0.00	1.61	5.40	2.50	1.92	3.39	6.93
Freshwater drum	417.99	269.77	586.05	661.45	254.72	139.26	323.34	306.90
Brook silverside	0.00	1.05	14.78	184.75	12.57	73.02	216.55	352.35
Mixed & unid minnows	699.40	1,152.54	400.06	11.08	0.26	0.00	0.00	0.00
Total	8,818.64	8,604.35	15,198.95	15,619.49	11,672.90	14,490.65	17,240.91	35,726.55

Appendix 8-J (Continued)

Species	78 (5)	79 (5)	80 (5)	81 (5)	82 (5)	83 (5)	84 (5)	85 (5)
Chestnut lamprey	0.00	0.00	0.00	0.43	0.00	0.00	0.49	0.00
Paddlefish	0.00	0.53	0.00	0.63	0.00	0.00	0.00	0.00
Spotted gar	0.43	14.18	0.42	8.43	0.00	12.67	1.95	15.32
Longnose gar	5.30	3.51	4.77	1.74	3.12	5.08	7.28	2.73
Shortnose gar	0.00	0.47	0.00	1.88	0.91	0.93	0.00	0.00
Skipjack herring	0.00	0.00	2.77	0.00	8.07	18.70	12.90	12.73
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	4,071.96	2,369.73	1,456.32	1,991.61	9,443.80	3,975.31	6,798.33	5,771.81
Threadfin shad	53.10	364.06	448.09	3,294.25	370.40	8,838.26	866.60	22,913.52
Mixed shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minnow,carp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central stoneroller	7.64	10.00	1.92	0.00	0.43	0.49	1.46	0.00
Goldfish	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Carp	9.46	17.47	12.49	42.35	12.41	13.78	2.92	19.14
Silver chub	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Golden shiner	229.84	352.64	661.97	337.37	187.65	518.18	335.79	280.62
Unidentified shiner	0.00	0.00	0.00	0.00	5.00	0.00	0.00	50.24
Emerald shiner	125.12	12.04	1.87	1.78	162.30	1,037.32	1,039.00	441.03
Ghost shiner	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.00
Common shiner	0.00	1.23	0.69	0.00	0.43	0.98	0.00	0.00
Spotfin shiner	24.75	1.40	0.00	13.76	187.77	163.12	375.00	289.54
Mimic shiner	1.38	0.00	0.00	0.00	0.00	0.00	0.44	0.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	3.85	0.00	0.00	0.00	0.00	24.98	2.73
Striped shiner	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00
Unidentified minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bluntnose minnow	0.00	0.00	0.00	7.54	0.00	0.00	1.36	0.00
Fathead minnow	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00

Appendix 8-J (Continued)

Species	78 (5)	79 (5)	80 (5)	81 (5)	82 (5)	83 (5)	84 (5)	85 (5)
Bullhead minnow	148.19	118.98	65.01	20.46	554.76	684.88	527.09	1,133.06
River carpsucker	0.00	0.00	0.00	0.00	0.00	0.00	3.38	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	0.00	0.00	3.11	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern hogsucker	0.34	1.20	0.31	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smallmouth buffalo	0.35	3.31	1.97	2.01	7.31	40.07	0.48	10.23
Bigmouth buffalo	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black buffalo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted sucker	26.33	26.23	14.01	12.47	6.70	12.09	39.85	21.36
Unidentified redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
River redhorse	3.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black redhorse	0.00	0.53	0.34	0.00	0.43	0.00	0.00	0.00
Golden redhorse	0.69	1.76	1.09	0.83	0.00	0.44	0.98	0.45
Blue catfish	3.33	0.00	5.59	0.00	0.00	0.00	0.00	0.00
Black bullhead	0.00	2.69	0.00	4.29	0.87	22.43	0.00	0.00
Yellow bullhead	1.57	7.34	19.86	19.55	179.13	29.25	45.46	6.31
Brown bullhead	0.00	0.00	0.00	0.00	0.48	7.16	0.45	6.46
Channel catfish	15.18	24.80	14.65	77.60	7.12	11.22	10.25	16.16
Flathead catfish	4.08	1.89	0.34	21.23	1.74	0.49	0.00	0.44
Killifish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00
Blackspotted topminnow	1.65	7.31	0.69	0.00	0.87	5.37	7.80	0.45
Mosquitofish	0.00	1.58	10.42	0.42	0.43	7.18	14.61	8.83
Unidentified temperate bass	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00
White bass	11.03	3.16	11.25	0.00	2.38	1.46	1.82	43.63
Yellow bass	115.59	4.61	127.85	267.37	276.05	124.79	111.65	125.92

Appendix 8-J (Continued)

Species	78 (5)	79 (5)	80 (5)	81 (5)	82 (5)	83 (5)	84 (5)	85 (5)
Rock bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified sunfish	0.34	15.81	6.77	0.00	0.00	0.00	0.00	0.00
Warmouth	348.87	896.53	1,304.00	2,822.21	1,768.28	3,526.85	1,660.22	336.27
Redbreast sunfish	16.79	0.47	0.00	92.17	2,697.45	1,933.69	156.89	0.00
Green sunfish	3.72	29.03	19.73	60.30	239.22	153.89	129.79	15.71
Orangespotted sunfish	0.00	1.78	2.21	0.00	0.00	0.00	0.00	0.00
Bluegill	15,974.88	14,288.25	27,264.54	24,879.80	13,680.82	16,917.70	12,247.35	10,661.56
Longear sunfish	274.31	1,130.45	369.40	116.27	99.27	126.03	781.71	246.72
Redear sunfish	464.89	1,160.45	2,712.38	21,963.89	5,020.22	10,458.48	2,801.73	2,910.31
Hybrid sunfish	0.35	0.38	0.00	0.00	0.00	0.00	0.00	0.45
Smallmouth bass	0.00	0.93	0.31	0.00	0.00	0.00	0.00	0.00
Spotted bass	62.78	38.77	6.39	3.22	316.28	158.99	102.49	18.50
Largemouth bass	581.58	834.42	976.84	715.53	442.69	361.67	430.92	303.81
White crappie	155.50	111.67	30.59	30.16	126.79	115.62	87.61	78.86
Black crappie	0.00	2.13	4.09	3.09	0.00	0.00	0.91	13.86
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	1.15	0.31	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.48
Orangethroat darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	328.31	70.25	192.76	120.50	65.12	105.14	62.90	88.70
Logperch	75.13	16.14	7.46	11.04	61.62	126.23	126.69	92.02
Sauger	1.48	1.86	0.00	0.00	0.00	0.00	0.00	0.44
Freshwater drum	156.54	175.47	146.50	310.97	223.10	312.44	230.17	361.73
Brook silverside	119.40	85.39	70.17	125.31	388.66	251.07	224.78	94.74
Mixed & unid minnows	0.00	0.00	0.00	0.00	0.00	143.24	14.61	13.33
Total	23,428.00	22,219.51	35,980.06	57,383.74	36,551.05	50,222.67	29,296.17	46,410.67

APPENDIX 8-K

MEAN BIOMASS (KG/HA) OF EACH FISH SPECIES
COLLECTED IN COVE ROTENONE SAMPLES FROM
CHICKAMAUGA RESERVOIR, 1970 THROUGH 1985,
NUMBER OF SAMPLES EACH YEAR IN PARENTHESIS

Appendix 8-K. Mean Biomass (kg/ha) of Each Fish Species Collected in Cove Rotenone Samples From Chickamauga Reservoir, 1970 Through 1985, Number of Samples Each Year in Parenthesis

Species	70 (12)	71 (4)	72 (4)	73 (4)	74 (4)	75 (4)	76 (5)	77 (5)
Chestnut lamprey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paddlefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86
Spotted gar	0.52	0.01	0.00	0.02	0.15	0.10	7.41	1.22
Longnose gar	0.04	0.00	0.71	0.01	0.05	0.04	0.02	0.25
Shortnose gar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07
Skipjack herring	0.44	0.00	1.23	1.47	1.31	0.41	0.60	0.39
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Gizzard shad	77.73	67.78	119.53	127.42	107.69	92.15	115.45	157.17
Threadfin shad	2.95	7.19	43.18	50.72	28.16	27.12	11.75	17.31
Mixed shad	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.01	0.00	0.00	0.08	0.06	0.00	0.08	0.17
Minnow,carp	0.00	0.00	0.00	0.27	0.00	0.02	0.00	0.01
Central stoneroller	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01
Goldfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carp	7.09	53.89	31.59	48.42	20.27	28.93	46.77	31.39
Silver chub	0.00	0.00	0.00	0.00	0.01	0.02	0.32	0.00
Golden shiner	0.18	0.00	0.16	0.73	0.27	0.15	1.46	2.05
Unidentified shiner	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Emerald shiner	0.00	0.00	0.18	0.27	0.01	0.14	0.21	0.26
Ghost shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Spotfin shiner	0.00	0.00	0.00	0.03	0.01	0.03	0.23	0.19
Mimic shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00

Appendix 8-K (Continued)

Species	70 (12)	71 (4)	72 (4)	73 (4)	74 (4)	75 (4)	76 (5)	77 (5)
Bluntnose minnow	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bullhead minnow	0.00	0.00	0.15	0.00	0.81	3.72	1.75	0.67
River carpsucker	0.00	0.00	0.23	0.39	0.00	0.00	0.18	0.00
Quillback carpsucker	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Northern hogsucker	0.00	0.03	0.25	0.23	0.00	0.03	0.54	0.19
Unidentified buffalo	9.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smallmouth buffalo	35.64	71.15	43.14	41.39	12.52	19.17	28.94	10.82
Bigmouth buffalo	14.63	0.00	0.00	0.00	0.00	1.12	0.00	0.00
Black buffalo	0.26	2.51	0.00	0.00	0.00	0.00	0.00	0.00
Spotted sucker	0.40	3.06	7.82	10.32	16.96	10.42	17.96	12.08
Unidentified redhorse	0.53	1.75	1.48	0.42	0.00	0.60	0.00	0.00
Shorthead redhorse	0.03	0.23	0.00	0.05	0.00	0.00	0.00	0.05
River redhorse	0.00	0.00	0.18	0.00	0.01	0.00	0.00	0.00
Black redhorse	1.53	0.00	0.99	0.00	0.00	0.00	2.19	0.32
Golden redhorse	3.77	3.96	2.96	3.45	4.78	0.29	2.16	2.27
Blue catfish	1.43	0.00	2.32	0.04	0.00	0.00	0.01	0.00
Black bullhead	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Yellow bullhead	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
Brown bullhead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Channel catfish	2.98	10.76	8.12	10.36	4.12	4.25	12.43	7.40
Flathead catfish	0.60	0.53	1.06	2.26	1.31	0.60	0.81	0.83
Killifish	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.16	0.00	0.00	0.00	0.02	0.00
Blackspotted topminnow	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
Mosquitofish	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix 8-K (Continued)

Species	70 (12)	71 (4)	72 (4)	73 (4)	74 (4)	75 (4)	76 (5)	77 (5)
White bass	0.21	0.08	0.08	0.44	0.20	0.06	0.24	0.54
Yellow bass	0.00	0.02	0.23	0.47	0.25	1.54	1.26	1.80
Rock bass	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.00
Warmouth	0.30	0.32	0.66	2.00	0.16	0.41	0.74	1.02
Redbreast sunfish	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.04
Green sunfish	0.16	0.09	0.10	0.19	0.03	0.00	0.01	0.07
Orangespotted sunfish	0.03	0.01	0.03	0.13	0.00	0.00	0.00	0.00
Bluegill	13.01	18.70	32.30	25.91	12.36	14.97	28.09	39.81
Longear sunfish	1.07	2.03	2.60	2.19	1.84	1.65	4.53	3.95
Redear sunfish	2.11	5.42	8.30	9.88	8.37	7.79	11.28	12.73
Hybrid sunfish	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Spotted bass	0.47	0.90	1.10	0.64	1.42	0.56	1.03	0.33
Largemouth bass	5.63	8.90	9.18	12.01	6.76	8.23	7.41	8.76
White crappie	4.02	4.23	3.11	3.70	1.22	1.35	1.55	1.56
Black crappie	0.10	0.00	0.10	0.00	0.00	0.13	0.00	0.65
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	0.10	0.57	0.57	0.85	0.44	0.09	0.49	1.25
Logperch	0.00	0.00	0.59	0.86	0.31	0.17	0.36	0.95
Sauger	0.23	0.00	0.19	0.82	0.28	0.26	0.78	0.28
Freshwater drum	29.48	17.54	38.88	39.21	18.22	12.35	26.92	25.28
Brook silverside	0.00	0.00	0.03	0.25	0.02	0.14	0.24	0.38
Mixed & unid minnows	0.85	1.58	0.52	0.01	0.76	0.00	0.00	0.00
Total	219.91	283.26	365.23	399.16	251.13	239.21	336.43	346.56

Appendix 8-K (Continued)

Species	78 (5)	79 (5)	80 (5)	81 (5)	82 (5)	83 (5)	84 (5)	85 (5)
Chestnut lamprey	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Paddlefish	0.00	0.26	0.00	0.14	0.00	0.00	0.00	0.00
Spotted gar	0.03	7.65	0.38	0.32	0.00	6.92	0.28	8.37
Longnose gar	0.29	0.47	0.19	0.08	0.20	0.35	0.07	0.16
Shortnose gar	0.00	0.09	0.00	1.14	0.19	0.50	0.00	0.00
Skipjack herring	0.00	0.00	0.04	0.00	0.21	0.84	0.46	1.27
Unidentified shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	122.92	92.80	37.36	166.14	161.89	242.39	338.63	269.18
Threadfin shad	0.34	0.81	0.79	8.29	1.02	23.67	2.13	92.21
Mixed shad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mooneye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minnow,carp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central stoneroller	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00
Goldfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carp	14.86	38.04	24.18	14.57	9.16	29.62	3.56	38.09
Silver chub	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Golden shiner	1.70	3.43	2.11	5.47	1.20	3.65	2.15	1.54
Unidentified shiner	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.04
Emerald shiner	0.69	0.06	0.01	0.00	0.29	0.91	1.05	0.61
Ghost shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Common shiner	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Spotfin shiner	0.03	0.00	0.00	0.02	0.22	0.18	0.38	0.30
Mimic shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steelcolor shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pugnose minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Striped shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bluntnose minnow	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Fathead minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix 8-K (Continued)

Species	78 (5)	79 (5)	80 (5)	81 (5)	82 (5)	83 (5)	84 (5)	85 (5)
Bullhead minnow	0.14	0.09	0.09	0.01	0.42	0.34	0.44	0.72
River carpsucker	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00
Quillback carpsucker	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
White sucker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern hogsucker	0.04	0.11	0.13	0.00	0.00	0.00	0.00	0.00
Unidentified buffalo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smallmouth buffalo	1.84	4.57	3.35	2.90	11.00	6.41	2.57	4.98
Bigmouth buffalo	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black buffalo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted sucker	8.21	6.60	7.31	9.34	3.50	3.05	6.41	7.36
Unidentified redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shorthead redhorse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
River redhorse	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black redhorse	0.00	0.38	0.29	0.00	0.17	0.00	0.00	0.00
Golden redhorse	0.47	1.39	0.81	0.82	0.00	0.11	0.09	0.04
Blue catfish	2.16	0.00	4.52	0.00	0.00	0.00	0.00	0.00
Black bullhead	0.00	0.05	0.00	0.10	0.00	0.94	0.00	0.00
Yellow bullhead	0.01	0.12	0.22	0.56	1.02	0.06	0.24	0.15
Brown bullhead	0.00	0.00	0.00	0.00	0.05	1.95	0.00	0.02
Channel catfish	4.18	14.24	7.73	59.17	6.01	12.69	11.64	9.42
Flathead catfish	0.58	0.55	0.00	0.26	0.63	0.01	0.00	0.20
Killifish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blackstripe topminnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blackspotted topminnow	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00
Mosquitofish	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01
Unidentified temperate bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White bass	0.03	0.05	0.05	0.00	0.14	0.18	0.32	1.20
Yellow bass	1.06	0.13	1.13	10.11	4.87	3.94	1.50	4.24

Appendix 8-K (Continued)

Species	78 (5)	79 (5)	80 (5)	81 (5)	82 (5)	83 (5)	84 (5)	85 (5)
Rock bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified sunfish	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Warmouth	1.64	3.15	2.64	8.65	3.45	4.13	3.58	0.81
Redbreast sunfish	0.09	0.01	0.00	0.36	3.30	1.44	0.12	0.00
Green sunfish	0.04	0.29	0.26	0.51	0.56	0.42	0.87	0.07
Orangespotted sunfish	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Bluegill	30.82	37.16	48.08	51.13	27.39	33.81	34.03	24.44
Longear sunfish	1.79	3.03	1.62	1.88	1.15	0.36	2.05	1.29
Redear sunfish	7.54	7.95	10.29	23.73	10.50	18.05	9.26	10.24
Hybrid sunfish	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Smallmouth bass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted bass	0.20	0.13	0.03	0.37	1.15	0.76	0.43	0.28
Largemouth bass	8.69	11.65	11.08	16.87	12.96	10.95	7.23	18.15
White crappie	2.71	3.58	1.85	1.17	0.90	0.40	0.41	0.86
Black crappie	0.00	0.15	0.13	0.11	0.00	0.00	0.00	0.30
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mud darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stripetail darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orangethroat darter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow perch	2.72	2.31	3.03	1.64	1.28	1.30	0.98	0.58
Logperch	0.34	0.14	0.03	0.14	0.32	0.65	0.62	0.44
Sauger	0.24	0.23	0.00	0.00	0.00	0.00	0.00	0.10
Freshwater drum	15.70	17.51	17.51	41.78	24.95	30.18	17.44	30.10
Brook silverside	0.12	0.07	0.07	0.23	0.40	0.23	0.19	0.09
Mixed & unid minnows	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02
Total	236.19	259.36	187.37	428.03	290.53	441.40	449.34	527.91

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