BASELINE WATER QUALITY OF SCHMIDT, HORNBEAM, AND HORSESHOE LAKES, DAKOTA COUNTY, MINNESOTA

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Multiply inch-pound unit	By	To obtain SI unit
acre	4.047	meter^2
foot	0.3048	meter

BASELINE WATER QUALITY OF SCHMIDT, HORSESHOE, AND HORNBEAM LAKES, DAKOTA COUNTY, MINNESOTA

By G. A. Payne

ABSTRACT

Three lakes in Dakota County were sampled five times during an 18-month period to determine baseline water quality prior to construction of an interstate highway. Results of physical measurements and chemical analyses showed that the lakes were shallow, nonstratified, and nutrient enriched. Considerable seasonal variations in dissolved solids, nutrient, and dissolved-oxygen concentrations were observed. Oxygen depletion and high nutrient concentrations were characteristic of conditions under an ice cover. Blue-green algal blooms typically were established soon after ice breakup and persisted until late fall. Data from the study will be supplemented with data collected during and after construction of the highway to assess the impact of highway construction and drainage on water quality of the lakes.

INTRODUCTION

Schmidt, Hornbeam, and Horseshoe Lakes (fig. 1) are located along the proposed route of Interstate Highway I-494 in Dakota County, Minn. The U.S. Geological Survey, in cooperation with the Minnesota Department of Transportation, sampled these lakes to determine their baseline water quality. The data from this study will be compared with data collected during and after highway construction in order to assess the effects of construction and highway drainage on water quality of the lakes. The purpose of this report is to document the findings of the preconstruction water-quality study.

The study lakes are located in the St. Croix moraine complex that was formed by the Superior Lobe during Wisconsin Glaciation (Wright, 1972). The moraine is characterized by knob and kettle topography, with small ponds occupying many of the depressions. Topographic relief is about 250 feet, ranging from less than 850 feet above the National Geodetic Vertical Datum of 1929 in kettles between Hornbeam and Horseshoe Lakes to more than 1,050 feet atop the morainic hills in the northeastern part of the area. Small farms and woodlands are scattered throughout, but much of the land has been developed for suburban residences.

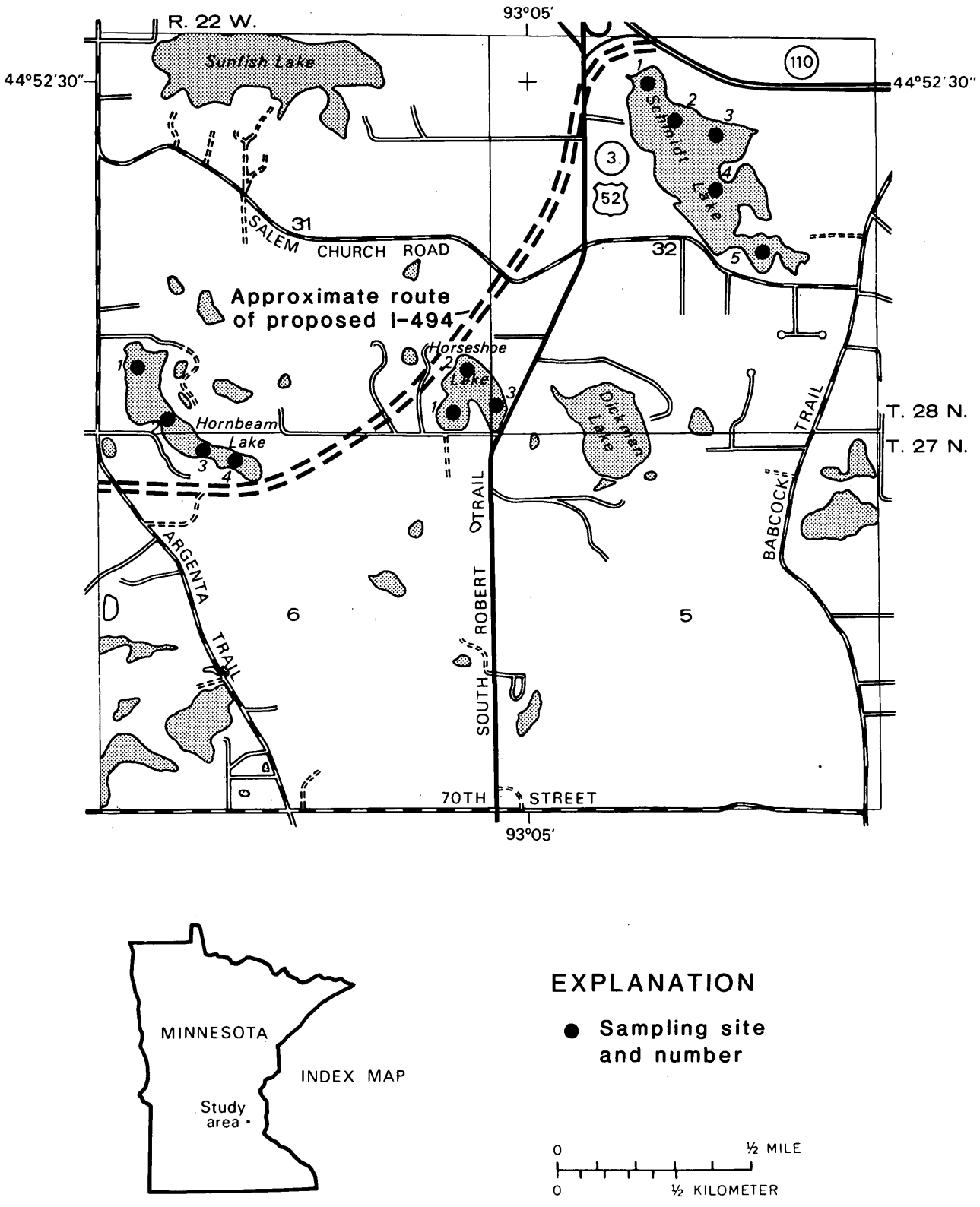

Figure 1.--Location of study lakes and sampling sites

METHODS AND SCOPE OF INVESTIGATION

The lakes were sampled in winter, summer, and fall of 1975 and spring and summer of 1976. Samples were collected at five sites in Schmidt Lake, four in Hornbeam Lake, and three in Horseshoe Lake. One sample was collected at each site 3 feet from the surface. Water temperature, air temperature, DO (dissolved oxygen), DO percent saturation, pH, and specific conductance were determined in the field for each site. Water temperature and DO profiles were measured during the June 1975 sampling. Water samples were analyzed in the laboratory for the nitrogen series, phosphorus, calcium, silica, sodium, chloride, total organic carbon, turbidity, dissolved solids, and suspended solids. Bottom material samples were collected at each site during the fall and winter sampling periods. The samples were analyzed in the laboratory for organic carbon, nitrogen, phosphorus, oil and grease, aluminum, arsenic, cadmium, chromium, copper, lead, mercury, and zinc.

Samples for analysis of physical and chemical characteristics were collected and determined by the methods of Brown and others (1970) and Goerlitz and Brown (1972). A DO meter was used to determine DO concentrations. DO concentration, altitude, and water temperature were used to calculate percentage saturation of DO, as described in American Public Health Association and others (1971, p. 480).

Phytoplankton samples were collected and analyzed in the laboratory to identify dominant or codominant genera and to determine total cell count. A genus is considered codominant if it constitutes 15 percent or more of the phytoplankton cells in a sample. Samples were also collected to detect the presence of fecal coliform and fecal Streptococci bacteria. Fecal coliform, fecal Streptococci, and phytoplankton were determined by methods described by Greeson and others (1977).

WATER QUALITY - SCHMIDT LAKE

Physical and Chemical Characteristics

Schmidt Lake is a shallow closed lake with a surface area of 59 acres. Depths measured in April 1976 at the five sites ranged from 5.5 to 6.0 feet. The lake has an extensive littoral zone. In June 1976, vigorous growths of submerged aquatic plants were present at all five sites.

The lake does not undergo strong thermal stratification during summer. Temperature profiles measured in June 1975 showed a maximum temperature gradient of only 1.0° Celsius from the water surface to the lake bottom. Because of the shallow depth, it is likely that wind action periodically mixes the lake water.

Concentrations of dissolved solids and individual dissolved constituents varied seasonally, but changes were similar at all sites except site 5, where higher concentrations were determined under an ice cover

during January 1975 (table 1). The average dissolved-solids concentration was 314 mg/L (milligrams per liter), ranging from 201 to 443 mg/L. Total alkalinity ranged from 58 to 213 mg/L.

Figure 2 shows chloride concentrations in the study lakes along with data from a study of 20 other lakes in Dakota County (Have, 1975). Chloride concentrations in Schmidt Lake ranged from 47 to 97 mg/L, whereas concentrations in the other Dakota County lakes ranged from 1.5 to 45 mg/L. Runoff containing deicing salt from an adjacent four-lane highway (highway 110 in figure 1) may be the source of the higher chloride concentrations in Schmidt Lake.

DO concentrations were lowest under an ice cover in the January of 1975 samples. Concentrations at all sites were less than 1 mg/L and did not exceed 5 percent saturation, which indicates chemical and biological oxidation and respiration under the ice cover, lowering DO concentrations. During the two summer samplings, DO concentrations exceeded 100 percent saturation, reflecting a high level of photosynthetic activity by phytoplankton and vascular aquatic plants.

pH values ranged from 7.4 to 7.8 at all sites, except during summer, when pH exceeded 9.0 in June 1975 and 10.0 in June 1976. The higher values were probably caused by high levels of photosynthetic activity. Photosynthesis can affect pH by removing carbon dioxide from solution, thereby affecting the carbonate equilibrium and causing a shift to a higher pH.

Total phosphorus concentrations ranged from 0.02 to 0.36 mg/L. These concentrations indicate a eutrophic condition, according to criteria established by the U.S. Environmental Protection Agency (1974).

During winter, 89 to 100 percent of the phosphorus was in dissolved form. Dissolved-phosphorus concentrations ranged from 0.14 to 0.25 mg/L in winter. When light and temperature conditions become optimal for algal growth during spring and summer, phosphorus is rapidly utilized, as shown by the much reduced dissolved-phosphorus concentrations in samples collected in June 1975 and April and June 1976, when concentrations ranged from 0.01 to 0.08 mg/L (table 1).

Total nitrogen concentrations were highest in winter, ranging from 3.0 to 5.1 mg/L. Dissolved-organic nitrogen plus ammonia constituted 78 to 94 percent of the total nitrogen in the winter samples. In spring and summer, total nitrogen concentrations were lower, ranging from 1.2 to 2.3 mg/L. Total nitrogen concentrations in fall samples were higher than those in spring and summer samples, ranging from 2.4 to 3.1 mg/L. Nitrite plus nitrate concentrations in fall ranged from 0.18 to 0.21 mg/L. These concentrations were higher than those in the winter, spring, and summer samples, which ranged from 0.00 to 0.12 mg/L.

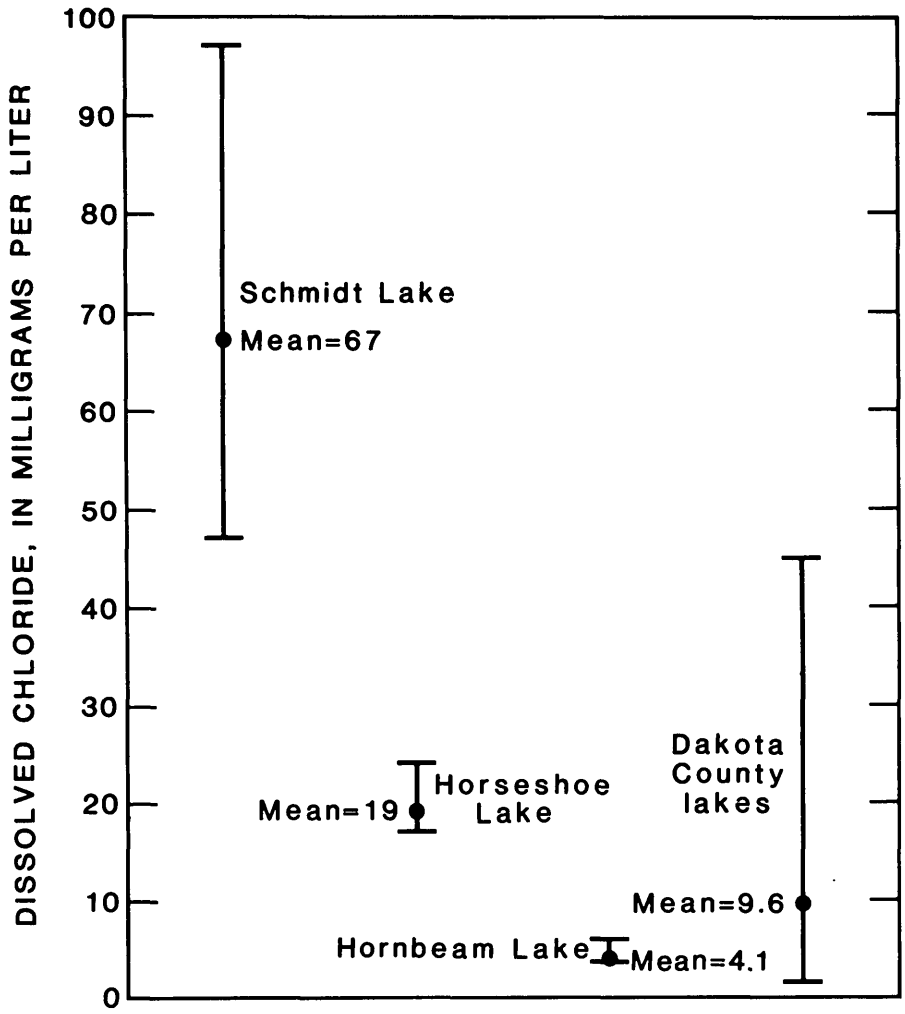

Figure 2.--Range of chloride concentrations for study lakes and 20 other lakes in Dakota County

Biological Characteristics

Results of the phytoplankton analyses show that blue-green algae were the dominant type during all sampling periods except fall 1975, when green algae were dominant.

Excessive production of algae, referred to as algal blooms, can be a serious problem in a lake. The severity of a bloom, however, depends on the type of algae as well as the cell concentration. Lee (1970) proposed that a concentration of 500 to 1,000 cells per milliliter indicates a bloom. All the samples collected from Schmidt Lake had concentrations of more than 1,000 cells per milliliter (table 2). The highest cell concentrations were found in the June 1976 samples. However, problems associated with blooms, such as coloration of the water, algal mats, and bad odors, were not apparent at that time. The water appeared clear and had measured transparencies of 2.7 to 3.4 feet.

Bacteria colony counts were usually low (0 to 15 colonies/100 mL), but higher counts (20 to 140 colonies/100 mL) were determined in some of the fall 1975 samples (table 1). Flocks of migrating ducks were observed on the study lakes at the time of the fall sampling and may have been the source of the fecal coliform and fecal Streptococci bacteria.

WATER QUALITY - HORNBEAM LAKE

Physical and Chemical Characteristics

Hornbeam Lake is shallow and has a 22-acre surface area. Depths measured during April 1976 ranged from 8.0 feet at site 4 to 11.0 feet at site 1.

Concentrations of the major chemical constituents were similar at all sites, indicating uniform water quality throughout the lake (table 1). Dissolved-solids concentrations ranged from 98 to 179 mg/L. Total alkalinity ranged from 74 to 135 mg/L. Chloride concentrations were lower than those in Schmidt and Horseshoe Lakes, ranging from 3.6 to 5.6 mg/L.

Dissolved oxygen and pH followed seasonal patterns similar to those in Schmidt Lake. Low dissolved-oxygen concentrations of 1.0 to 3.2 mg/L (8 to 24 percent saturation) were found under the ice cover in February 1975. During open-water conditions, dissolved oxygen ranged from 6.6 to 12.8 mg/L (55 to 154 percent saturation). pH ranged from 7.3 to 9.2.

Total phosphorus concentrations ranged from 0.06 to 0.20 mg/L. The concentrations were appreciably higher in June 1976 (0.11 to 0.14 mg/L) than in June 1975 (0.06 to 0.08 mg/L), suggesting significant year-to-year variation in phosphorus loading to the lake. Seasonal variation in concentrations is shown by comparison of April 1976 concentrations (0.19 to 0.20 mg/L) with those from June 1976 (0.11 to 0.14 mg/L).

Table 2.—Phytoplankton concentrations for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.

[Symbols used for types: BG, blue-green algae; D, diatoms; E, euglenoids; F, flagellate; G, green algae; YB, yellow-brown algae]

Date	Site	Number of cells per milliliter	Dominant genera			Codominant genera			Codominant genera		
			Genus	Type	Percent of total cells	Genus	Type	Percent of total cells	Genus	Type	Percent of total cells
					SCHMIDT LAKE						
01-30-75	1	1,200	Agmenellum	BG	36	Anacystis	BG	24	Lyngbya	BG	20
	2	7,700	Anacystis	BG	44	Agmenellum	BG	31	do	BG	16
	3	11,000	do	BG	58	do	BG	22	—	—	—
	4	5,000	Oscillatoria	BG	63	Lyngbya	BG	25	—	—	—
	5	4,500	Anacystis	BG	73	—	—	—	—	—	—
06-25-75	1	47,000	Aphanizomenon	BG	76	Anabena	BG	20	—	—	—
	2	25,000	Anabena	BG	56	Aphanizomenon	BG	31	—	—	—
	3	47,000	do	BG	42	Schroederia	G	35	—	—	—
	4	4,200	Oscillatoria	BG	38	do	G	30	—	—	—
	5	5,500	Anacystis	BG	49	Agmenellum	BG	23	—	—	—
11-18-75	1	24,000	Ankistrodesmus	G	38	Chlamydomonas	G	21	Glenodinium	F	17
	2	16,000	Chlamydomonas	G	43	Ankistrodesmus	G	20	—	—	—
	3	16,000	Kirchneriella	G	47	do	G	23	Chlamydomonas	G	20
	4	21,000	do	G	42	Chlamydomonas	G	25	Ankistrodesmus	G	18
	5	7,500	Ankistrodesmus	G	33	do	G	26	Glenodinium	F	21
04-13-76	1	22,000	Oscillatoria	BG	44	Ankistrodesmus	G	14	—	—	—
	2	53,000	Raphidiopsis	BG	69	—	—	—	—	—	—
	3	28,000	Oscillatoria	BG	37	—	—	—	—	—	—
	4	33,000	do	BG	49	—	—	—	—	—	—
	5	28,000	Ochromonas	YB	43	Rhodomonas	E	37	—	—	—
06-22-76	1	8,700	Oscillatoria	BG	72	—	—	—	—	—	—
	2	120,000	do	BG	75	—	—	—	—	—	—
	3	200,000	do	BG	50	Anacystis	BG	26	Aphanizomenon	BG	23
	4	40,000	do	BG	47	Gomphosphaeria	BG	28	do	BG	19
	5	11,000	do	BG	48	—	—	—	—	—	—

Table 2.—Phytoplankton concentrations for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.—Continued

[Symbols used for types: BG, blue-green algae; D, diatoms; E, euglenoids; F, flagellate; G, green algae; YB, yellow-brown algae]

Date	Site	Number of cells per milliliter	Dominant genera			Codominant genera			Codominant genera		
			Genus	Type	Percent of total cells	Genus	Type	Percent of total cells	Genus	Type	Percent of total cells
					HORNBEAM LAKE						
02-04-75	1	240,000	Oscillatoria	BG	44	Lyngbya	BG	42	—	—	—
	2	450,000	Lyngbya	BG	46	Oscillatoria	BG	41	—	—	—
	3	360,000	Oscillatoria	BG	48	Lyngbya	BG	43	—	—	—
	4	—	—	—	—	—	—	—	—	—	—
06-27-75	1	260,000	Anacystis	BG	56	Oscillatoria	BG	34	—	—	—
	2	140,000	Oscillatoria	BG	73	Lyngbya	BG	18	—	—	—
	3	280,000	do	BG	84	—	—	—	—	—	—
	4	250,000	Anacystis	BG	47	Oscillatoria	BG	38	—	—	—
11-19-75	1	500,000	Oscillatoria	BG	95	—	—	—	—	—	—
	2	450,000	do	BG	93	—	—	—	—	—	—
	3	deleted	—	—	—	—	—	—	—	—	—
	4	500,000	Oscillatoria	BG	92	—	—	—	—	—	—
04-27-76	1	1,900,000	Oscillatoria	BG	98	—	—	—	—	—	—
	2	1,400,000	do	BG	96	—	—	—	—	—	—
	3	1,300,000	do	BG	97	—	—	—	—	—	—
	4	910,000	do	BG	99	—	—	—	—	—	—
06-23-76	1	900,000	Oscillatoria	BG	77	—	—	—	—	—	—
	2	320,000	do	BG	59	Aphanizomenon	BG	37	—	—	—
	3	980,000	do	BG	96	—	—	—	—	—	—
	4	1,300,000	do	BG	90	—	—	—	—	—	—

Table 2.—Phytoplankton concentrations for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.—Continued

[Symbols used for types: BG, blue-green algae; D, diatoms; E, euglenoids; F, flagellate; G, green algae; YB, yellow-brown algae]

Date	Site	Number of cells per milliliter	Dominant genera			Codominant genera			Codominant genera		
			Genus	Type	Percent of total cells	Genus	Type	Percent of total cells	Genus	Type	Percent of total cells
					HORSESHOE LAKE						
01-30-75	1	19,000	Anacystis	BG	50	Lyngbya	BG	26	—	—	—
	2	34,000	do	BG	68	Gomphosphaeria	BG	17	—	—	—
	3	27,000	do	BG	64	Agmenellum	BG	24	—	—	—
06-26-75	1	91,000	Aphanizomenon	BG	74	—	—	—	—	—	—
	2	120,000	do	BG	49	Agmenellum	BG	21	Anacystis	BG	18
	3	160,000	do	BG	90	—	—	—	—	—	—
11-21-75	1	79,000	Scenedesmus	G	38	Oscillatoria	BG	30	—	—	—
	2	46,000	do	G	33	Tetraedron	G	23	Anacystis	BG	19
	3	64,000	do	G	43	—	—	—	—	—	—
04-19-76	1	59,000	Scenedesmus	G	39	Anacystis	BG	31	—	—	—
	2	71,000	do	G	41	do	BG	35	—	—	—
	3	75,000	do	G	44	Dictyosphaerium	BG	18	—	—	—
06-21-76	1	360,000	Anacystis	BG	40	Lyngbya	BG	26	Oscillatoria	BG	18
	2	110,000	Oscillatoria	BG	31	Anacystis	BG	25	—	—	—
	3	280,000	Anacystis	BG	45	Oscillatoria	BG	19	Lyngbya	BG	15

Total nitrogen concentrations, which ranged from 1.3 to 4.1 mg/L, were highest in the fall samples (3.1 to 4.1 mg/L). Total nitrogen concentrations, like total phosphorus concentrations, were higher in June 1976 (1.9 to 2.3 mg/L) than in June 1975 (1.3 to 1.5 mg/L). Organic nitrogen and ammonia constituted 97 to 100 percent of the total nitrogen in the samples. Total nitrite plus nitrate nitrogen ranged from 0.00 to 0.10 mg/L. As in Schmidt Lake, nitrite plus nitrate concentrations were highest in the fall samples (0.06 to 0.10 mg/L).

Biological Characteristics

Hornbeam Lake lacked the abundant growth of submerged vascular plants observed in Schmidt Lake. Algae, however, were abundant. Cell counts exceeded 1 million cells per milliliter in some samples. The analyses show that blue-green algae were the dominant type of phytoplankton during all sampling periods (table 2). Oscillatoria was one of the dominant or codominant genera in every sample and frequently constitued more than 90 percent of the algal population. The low transparency values obtained in April and June 1976 (table 1) are a result of very high concentrations of algal cells. Algal production was high even under conditions of low light intensity and low temperatures, as shown by counts of 240,000 to 450,000 cells per milliliter in February 1975.

Bacteria colony counts ranged from 0 to 8 colonies/100 mL in the winter, spring, and summer samples, except for one sample collected at site 2 during June 1976 which had counts of 40 fecal coliform and 42 fecal Streptococci colonies (table 1). As in Schmidt Lake, higher counts (12 to 24 colonies/100 mL) were obtained from some of the fall 1975 samples.

WATER QUALITY - HORSESHOE LAKE

Physical and Chemical Characteristics

Horseshoe Lake has a surface area of 16 acres. Depths measured at the three sampling sites during April 1976 ranged from 7.0 to 8.0 feet. Water flows from the lake only at high stages. During the study, the lake stage was about 1 foot below the culvert outlet, preventing outflow. Dissolved-solids concentrations ranged from 139 to 191 mg/L (table 1). Dissolved solids varied only slightly between sites. Total alkalinity ranged from 78 to 118 mg/L. Chloride concentrations ranged from 16 to 24 mg/L and were higher than in Hornbeam Lake but not as high as in Schmidt Lake.

DO concentrations were less than 1.0 mg/L (4 to 6 percent saturation) in winter. During open-water periods DO concentrations ranged from 6.5 to 12.0 mg/L (59 to 143 percent saturation, except at site 3 in November 1975 when the DO concentration was 4.6 mg/L (35 percent saturation). pH ranged from 7.3 (February 1975) to 9.2 (June 1975), showing seasonal trends similar to those in Schmidt Lake.

Total phosphorus concentrations ranged from 0.05 to 0.12 mg/L. Dissolved-phosphorus concentrations ranged from 0.00 to 0.06 mg/L. Seasonal variations in total phosphorus concentrations were not as extreme as in Schmidt and Hornbeam Lakes.

Total nitrogen concentrations ranged from 1.2 to 2.8 mg/L, 90 percent or more of which was organic nitrogen and ammonia. Total nitrite plus nitrate concentrations ranged from 0.00 to 0.23 mg/L and were highest in fall and winter samples (0.11 to 0.23 mg/L) and low in spring and summer samples (0.00 to 0.02 mg/L). The high values for the winter samples, however, are suspect because dissolved nitrite plus nitrate was reported in low concentrations for the winter samples.

Biological Characteristics

Blue-green algae were dominant or codominant in all the samples and completely dominated the phytoplankton populations in summer 1975, fall 1975, and summer 1976 samples. Green algae were among the dominant genera in fall 1975 and spring 1976 samples. Cell counts were high, exceeding 100,000 cells per milliliter in samples collected in the summers of 1975 and 1976.

Emergent aquatic vegetation was limited to less than 10 percent of the shoreline. Submergent vegetation was not observed.

As in the other study lakes, the fall 1975 samples had the highest bacteria colony counts (60 to 180 colonies/100 mL). Counts determined from winter, spring, and summer samples were much lower, ranging from 0 to 11 colonies/100 mL (table 1).

DISCUSSION

Schmidt, Hornbeam, and Horseshoe Lakes are shallow, closed, water bodies. Because they are shallow, wind action promotes mixing of the water, and the lakes do not thermally stratify. Nearly complete mixing was indicated by similar values for major chemical constituents at all sites on each lake, but some variation in concentrations between sites did occur under an ice cover.

In contrast to the similarity of concentrations within each lake, there was an appreciable difference in dissolved solids between lakes. Schmidt Lake had the highest dissolved-solids concentrations, a significant part of which can be attributed to its high dissolved sodium and chloride concentrations.

Dissolved-solids concentrations also changed seasonally. The available data are not sufficient to define the seasonal changes completely or to explain them, but they do show that the changes are large enough to require close attention when data from the construction and post-construction studies are collected for comparison with the data from this study.

Some of the seasonal changes in concentrations may be attributed to changes in the volume of water contained in the lakes. Because the lakes are shallow, a relatively small change in lake stage represents a fairly large change in volume. Volume changes are caused by runoff, evaporation, freezing, and possibly, ground-water inflow or outflow.

Another factor affecting concentrations, particularly nutrient concentrations, is the effect of seasonal climatic changes on biological processes. Water temperature, sunlight intensity, snow and ice cover, and other climate-related physical phenomena all have an effect on the biota, which by their activity can greatly affect nutrient concentrations.

The data show that all three lakes were well enriched with nitrogen and phosphorus. Furthermore, concentrations of these nutrients were usually highest at the time of spring thaw. The shallow depths promoted rapid warming soon after ice breakup, bringing about favorable conditions for rapid utilization of available nutrients and early formation of dense algal blooms.

The response of phytoplankton to the enriched waters is shown by the high cell counts found in almost all the samples. Moreover, the phytoplankton populations were frequently dominated by Anacystis, Anabaena, and Aphanizomenon, which are indicative of eutrophic waters.

The lakes remained highly productive throughout the summer and into late fall until they were covered by ice. Early winter samples were not obtained, but it is likely that there is rapid die-off of phytoplankton when snow and ice cover are established. In Hornbeam Lake, however, considerable blue-green algae production continued under an ice cover, as shown by samples collected in February.

Decomposition of plankton along with chemical oxidation during winter deplete the relatively small volume of oxygen in these shallow lakes, making the lakes unsuitable for game fish. Furthermore, anoxic conditions may promote release of phosphorus from bottom sediments, thereby recycling some of the phosphorus and making it available to nourish algal blooms the following year.

Increases in total nitrogen and phosphorus concentrations during open-water periods suggest that the lakes are subject to periodic inputs of nutrients from their watersheds in addition to the nutrients that become available from cycling within the lakes.

Bacteria colony counts were low in most samples except for those collected in the fall of 1975. The higher counts obtained in the fall of 1975 samples indicate some bacterial contamination of fecal origin, possibly from migrating waterfowl.

No interpretation has been made of the results of bottom-material analyses listed in table 1. Bottom material was collected primarily to define baseline concentrations. The range in concentrations between

sites and between samplings suggests a significant amount of sampling error. The range of concentrations, however, was similar for each lake, suggesting that the sampling may provide adequate definition of conditions to facilitate meaningful comparisons with post-construction data.

SUMMARY

Baseline water quality for Schmidt, Hornbeam, and Horseshoe Lakes was determined from winter, spring, summer, and fall samples collected during an 18-month period.

Results of chemical analyses and physical measurements showed that the lakes were shallow, non-stratified, well mixed, and nutrient enriched. Response to nutrient enrichment was shown by high phytoplankton cell counts and the dominance of blue-green algae.

Significant seasonal changes in dissolved solids and nutrient concentrations were shown by comparison of the results of analyses from winter, spring, summer, and fall samples. DO concentrations were also seasonally affected, as shown by severe oxygen depletion during winter.

Samples collected for fecal coliform and fecal Streptococci bacteria indicated only slight fecal contamination most of which was detected in the fall samples.

Dissolved-chloride concentrations in Schmidt and Horseshoe Lakes were higher than those found in Hornbeam Lake and 20 other Dakota County lakes, suggesting influence of runoff containing road deicing salt.

Physical, chemical, and biological data are presented in tables 1 and 2 for the purpose of documenting preconstruction water quality of Schmidt, Hornbeam, and Horseshoe Lakes.

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Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
JAN , 1975											
30...	1530	-15.0	1.5	--	--	.6	4	7.5	11	625	390
JUN											
25...	1100	27.0	25.5	--	--	12.2	151	9.2	.1	359	226
NOV											
18...	1125	12.0	5.0	--	--	7.7	62	7.6	--	460	291
APR , 1976											
13...	1030	20.6	11.5	6.0	.98	9.3	88	7.8	4.0	550	312
JUN											
22...	1245	27.0	25.0	4.5	1.07	11.8	144	10.5	.0	535	287

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
JAN , 1975											
30...	9	5	60	37	12	213	0	175	84	2.9	.10
JUN											
25...	0	2	33	24	4.6	80	17	94	49	1.4	.20
NOV											
18...	1	1	47	25	5.0	--	--	--	50	2.2	1.6
APR , 1976											
13...	3	3	50	32	4.4	156	0	128	69	1.6	.93
JUN											
22...	2	2	29	37	1.9	80	0	66	81	1.2	.32

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
JAN , 1975											
30...	2.8	.08	.08	3.0	.19	.19	16	--	8	4	15000
JUN											
25...	1.2	.00	.00	1.4	.08	.02	10	--	--	--	--
NOV											
18...	.64	.20	.20	2.4	.10	.02	11	--	15	15	6100
APR , 1976											
13...	.67	.02	.02	1.6	.09	.01	8.4	0	0	3	--
JUN											
22...	.88	.02	.00	1.2	.12	.06	12	--	0	15	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
JAN , 1975										
30...	7	49	17	24	90	.0	3060	--	51	84
JUN										
25...	--	--	--	--	--	--	--	--	--	--
NOV										
18...	11	79	46	30	60	.0	8900	2.0	330	70
APR , 1976										
13...	--	--	--	--	--	--	--	--	--	--
JUN										
22...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
JAN , 1975											
30...	1445	-15.0	1.5	--	--	.7	5	7.5	11	700	388
JUN											
25...	1130	27.0	25.5	--	--	11.2	138	9.2	.1	362	228
NOV											
18...	1040	12.0	5.0	--	--	7.7	62	7.7	--	460	292
APR , 1976											
13...	1020	18.3	11.5	6.0	1.10	9.3	88	7.8	3.9	550	318
JUN											
22...	1225	26.0	26.0	5.4	1.07	12.4	155	10.4	.0	522	300

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
JAN , 1975											
30...	7	4	61	38	12	224	0	184	84	3.2	.20
JUN											
25...	12	4	33	24	4.7	90	13	95	48	1.4	.49
NOV											
18...	1	1	50	23	5.0	--	--	--	49	2.4	.10
APR , 1976											
13...	3	2	50	32	4.3	152	0	125	67	1.7	.92
JUN											
22...	4	1	31	36	2.6	52	10	59	81	1.2	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
JAN , 1975											
30...	3.0	.02	.01	3.2	.20	.20	17	--	0	0	17000
JUN											
25...	.91	.08	.08	1.5	.08	.02	12	--	--	--	--
NOV											
18...	2.3	.21	.21	2.6	.36	.03	13	--	90	55	7900
APR , 1976											
13...	.78	.01	.01	1.7	.02	.01	7.9	0	0	0	--
JUN											
22	--	.01	.01	1.2	.11	--	10	--	0	12	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
JAN , 1975										
30...	10	52	20	27	70	.0	8000	--	64	91
JUN										
25...	--	--	--	--	--	--	--	--	--	--
NOV										
18...	11	87	30	30	90	.0	10200	3.0	350	92
APR , 1976										
13...	--	--	--	--	--	--	--	--	--	--
JUN										
22...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
JAN , 1975											
30...	1400	-15.0	1.0	--	--	.7	5	7.5	11	675	398
JUN											
25...	1200	27.0	25.5	--	--	11.1	137	8.8	.3	356	219
NOV											
18...	1105	12.0	5.0	--	--	7.5	60	7.7	--	460	293
APR , 1976											
13...	1015	16.1	11.5	5.5	.91	9.4	89	7.8	3.9	537	311
JUN											
22...	1200	26.0	26.0	5.5	1.07	13.0	162	10.4	.0	520	285

DATE	SOLIDS, SUSP. TOTAL, PESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
JAN , 1975											
30...	4	3	62	38	12	222	0	182	87	3.2	.20
JUN											
25...	0	4	35	24	4.7	105	4	93	47	1.3	.10
NOV											
18...	3	0	50	22	5.0	--	--	--	49	2.2	2.2
APR , 1976											
13...	4	2	50	32	4.4	153	0	126	70	1.6	.82
JUN											
22...	2	1	30	32	2.3	53	9	58	80	1.3	.50

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
JAN , 1975											
30...	3.0	.07	.02	3.3	.15	.14	14	--	0	0	9100
JUN											
25...	1.2	.11	.11	1.4	.08	.03	12	--	--	--	--
NOV											
18...	.00	.21	.21	2.4	.08	.01	13	--	20	140	6600
APR , 1976											
13...	.78	.00	.00	1.6	.10	.01	8.8	0	0	0	--
JUN											
22...	.80	.01	.01	1.3	.12	.07	9.6	--	0	0	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
JAN , 1975										
30...	14	86	22	26	40	.1	15000	--	430	94
JUN										
25...	--	--	--	--	--	--	--	--	--	--
NOV										
18...	12	75	25	30	70	.0	8700	4.0	360	84
APR , 1976										
13...	--	--	--	--	--	--	--	--	--	--
JUN										
22...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
JAN , 1975											
30...	1230	-15.0	.0	--	--	.7	5	7.4	14	675	402
JUN											
25...	1245	27.0	25.0	--	--	10.0	122	8.9	.2	369	224
NOV											
18...	1015	12.0	5.0	--	--	7.2	58	7.6	--	460	294
APR , 1976											
13...	1000	13.9	11.5	5.5	.95	9.2	87	7.8	3.9	542	319
JUN											
22...	1030	26.0	24.0	5.4	.91	12.5	151	10.7	.0	510	284

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM, DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
JAN , 1975											
30...	7	3	62	39	12	224	0	184	87	3.0	.20
JUN											
25...	16	4	39	25	4.8	99	8	95	48	2.2	.50
NOV											
18...	4	1	50	23	4.9	--	--	--	49	2.3	1.1
APR , 1976											
13...	4	2	49	31	4.4	154	0	126	68	1.5	.63
JUN											
22...	2	1	28	36	2.2	48	13	61	80	1.3	.67

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
JAN , 1975											
30...	2.8	.05	.02	3.0	.15	.15	16	--	0	0	--
JUN											
25...	1.7	.11	.08	2.3	.14	.06	12	--	--	--	--
NOV											
18...	1.2	.20	.20	2.5	.05	.01	13	--	5	20	9800
APR , 1976											
13...	.87	.00	.00	1.5	.09	.01	11	0	1	1	--
JUN											
22...	.63	.01	.00	1.3	.11	.06	9.7	--	0	1	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
JAN , 1975										
30...	--	--	--	--	--	.0	--	--	--	--
JUN										
25...	--	--	--	--	--	--	--	--	--	--
NOV										
18...	11	77	35	40	90	.0	9200	3.0	370	108
APR , 1976										
13...	--	--	--	--	--	--	--	--	--	--
JUN										
22...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

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DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
JAN , 1975											
30...	1145	-15.0	.0	--	--	.7	5	7.5	13	725	443
JUN											
25...	1315	27.0	24.0	--	--	11.3	136	9.5	.0	319	201
NOV											
18...	0935	12.0	5.0	--	--	4.4	35	7.4	--	460	295
APR , 1976											
13...	0945	11.7	11.0	5.5	.95	8.0	74	7.7	4.9	527	311
JUN											
22...	1000	26.0	24.0	5.1	1.07	12.4	149	10.6	.0	510	289

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
JAN , 1975											
30...	34	6	70	44	13	260	0	213	97	5.0	1.0
JUN											
25...	0	2	26	24	2.6	60	18	79	50	1.7	.79
NOV											
18...	3	0	50	23	4.8	--	--	--	48	2.9	1.1
APR , 1976											
13...	1	2	49	31	3.9	155	0	127	68	1.8	1.0
JUN											
22...	5	1	32	31	2.0	11	35	67	81	1.3	.45

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
JAN , 1975											
30...	4.0	.12	.01	5.1	.28	.25	24	--	0	0	16000
JUN											
25...	.91	.02	.02	1.7	.17	.04	11	--	--	--	--
NOV											
18...	1.8	.18	.17	3.1	.06	.01	10	--	5	30	6100
APR , 1976											
13...	.77	.00	.00	1.8	.09	.01	11	0	3	3	--
JUN											
22...	.85	.03	.00	1.3	.14	.08	9.2	--	0	2	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
JAN , 1975										
30...	9	77	21	25	50	.0	10000	--	110	81
JUN										
25...	--	--	--	--	--	--	--	--	--	--
NOV										
18...	9	48	20	30	80	.0	6300	3.0	340	88
APR , 1976										
13...	--	--	--	--	--	--	--	--	--	--
JUN										
22...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
04...	1200	-3.0	1.0	--	--	1.1	8	7.3	13	285	168
JUN											
27...	1030	28.0	26.0	--	--	7.5	94	8.4	.6	184	120
NOV											
19...	0900	7.0	6.0	--	--	6.6	55	7.7	--	189	113
APR , 1976											
27...	1400	15.0	12.5	11	.30	12.2	116	9.0	.1	153	102
JUN											
23...	1200	27.0	25.0	8.9	.40	12.4	151	9.2	.1	180	114

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
04...	11	4	31	5.0	1.2	163	0	134	5.0	2.5	.50
JUN											
27...	0	3	21	3.9	.5	99	1	83	4.0	1.5	.72
NOV											
19...	15	10	25	3.9	.2	--	--	--	4.8	3.9	2.4
APR , 1976											
27...	21	21	18	3.7	1.1	76	8	76	4.2	3.4	2.5
JUN											
23...	5	10	18	3.9	.7	104	0	85	4.7	2.3	1.4

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
04...	2.0	.06	.06	2.6	.07	.03	14	--	0	0	14000
JUN											
27...	.78	.00	.00	1.5	.07	.01	14	--	--	--	--
NOV											
19...	1.5	.10	.07	4.0	.11	.00	24	--	24	12	5300
APR , 1976											
27...	.89	.00	.00	3.4	.20	.01	25	--	8	1	--
JUN											
23...	.90	.03	.00	2.3	.12	.04	13	--	86	84	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
04...	5	41	11	65	90	.0	6000	--	140	58
JUN										
27...	--	--	--	--	--	--	--	--	--	--
NOV										
19...	7	108	28	90	50	.0	10300	3.0	230	96
APR , 1976										
27...	--	--	--	--	--	--	--	--	--	--
JUN										
23...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
04...	1120	-3.0	1.0	--	--	1.2	9	7.4	11	280	166
JUN											
27...	1100	28.0	26.5	--	--	7.6	96	8.6	.4	181	118
NOV											
19...	0945	7.0	6.0	--	--	9.5	79	7.7	--	182	110
APR , 1976											
27...	1345	14.4	12.5	9.0	.34	12.5	119	9.0	.1	163	102
JUN											
23...	1145	27.0	24.0	7.8	.40	12.0	146	9.1	.1	180	115

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
04...	3	3	30	4.7	1.2	165	0	135	5.3	2.8	1.0
JUN											
27...	20	3	25	4.0	.5	96	2	82	3.6	1.3	.49
NOV											
19...	18	12	24	3.9	.1	--	--	--	4.9	4.0	2.4
APR , 1976											
27...	28	24	18	3.6	1.1	78	7	76	4.4	3.4	2.5
JUN											
23...	11	10	20	3.5	.7	100	0	82	5.0	2.1	1.4

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
04...	1.8	.05	.05	2.8	.07	.00	14	--	2	0	13000
JUN											
27...	.81	.01	.00	1.3	.06	.01	9.5	--	--	--	--
NOV											
19...	1.6	.06	.06	4.1	.12	.00	23	--	16	12	4800
APR , 1976											
27...	.93	.00	.00	3.4	.19	.01	19	--	4	2	--
JUN											
23...	.75	.03	.03	2.1	.14	.03	17	--	40	42	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
04...	5	46	14	37	50	.0	7000	--	140	69
JUN										
27...	--	--	--	--	--	--	--	--	--	--
NOV										
19...	9	81	20	70	50	.0	9400	2.0	290	92
APR , 1976										
27...	--	--	--	--	--	--	--	--	--	--
JUN										
23...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
04...	1045	-3.0	1.0	--	--	1.0	8	7.4	11	290	179
JUN											
27...	1130	28.0	26.0	--	--	8.2	102	8.3	.9	185	117
NOV											
19...	1015	7.0	6.0	--	--	7.9	65	7.9	--	189	110
APR , 1976											
27...	1330	14.4	12.0	9.0	.34	12.2	116	9.0	.1	161	98
JUN											
23...	1130	27.0	24.0	9.4	.37	11.8	142	9.0	.2	180	117

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
04...	6	3	30	4.8	1.0	165	0	135	5.6	2.5	.60
JUN											
27...	16	3	20	3.9	.4	106	0	87	3.9	1.4	.20
NOV											
19...	19	11	21	4.3	.2	--	--	--	4.8	3.8	2.2
APR , 1976											
27...	21	21	17	3.4	1.1	78	6	74	4.2	3.5	2.5
JUN											
23...	15	5	19	4.0	.5	107	0	88	4.9	1.9	1.2

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
04...	1.9	.05	.05	2.5	.07	.00	19	--	0	2	8500
JUN											
27...	1.2	.02	.02	1.4	.08	.01	10	--	--	--	--
NOV											
19...	1.6	.07	.07	3.9	.12	.01	19	--	20	24	4800
APR , 1976											
27...	1.0	.00	.00	3.5	.19	.01	21	--	5	3	--
JUN											
23...	.69	.03	.00	1.9	.11	.02	8.7	--	81	812	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
04...	7	69	16	46	90	.0	9500	--	350	98
JUN										
27...	--	--	--	--	--	--	--	--	--	--
NOV										
19...	6	53	30	50	40	.0	6100	3.0	200	62
APR , 1976										
27...	--	--	--	--	--	--	--	--	--	--
JUN										
23...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

4

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
04...	1000	-3.0	1.0	--	--	3.2	24	7.4	11	280	158
JUN											
27...	1200	28.0	26.0	--	--	8.5	106	8.7	.3	183	120
NOV											
19...	1040	6.0	6.0	--	--	7.8	64	7.8	--	189	109
APR , 1976											
27...	1300	13.9	12.0	8.0	.34	12.1	115	9.1	.1	154	99
JUN											
23...	1100	27.0	24.0	7.5	.40	12.8	154	9.2	.1	175	113

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
04...	4	4	31	4.7	1.1	165	0	135	5.1	2.4	2.0
JUN											
27...	20	3	26	4.1	.3	93	4	83	3.9	1.5	.72
NOV											
19...	19	13	21	3.9	.2	--	--	--	4.9	3.0	1.6
APR , 1976											
27...	33	22	18	3.5	1.1	82	5	76	4.3	3.5	2.5
JUN											
23...	3	3	19	4.4	.7	99	0	81	4.0	2.1	1.2

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
04...	.44	.05	.05	2.4	.07	.00	11	--	0	0	12000
JUN											
27...	.78	.01	.00	1.5	.06	.01	6.3	--	--	--	--
NOV											
19...	1.4	.06	.06	3.1	.12	.01	21	--	8	0	4300
APR , 1976											
27...	.96	.00	.00	3.5	.20	.01	20	--	0	2	--
JUN											
23...	.88	.02	.01	2.1	.14	.02	11	--	B1	B1	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
04...	6	42	13	25	--	.0	6000	--	220	74
JUN										
27...	--	--	--	--	--	--	--	--	--	--
NOV										
19...	8	59	17	70	40	.0	6900	2.0	120	68
APR , 1976										
27...	--	--	--	--	--	--	--	--	--	--
JUN										
23...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

1

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
03...	1010	-5.0	1.0	--	--	.8	6	7.4	9.0	330	191
JUN											
26...	1000	28.0	26.0	--	--	10.9	136	9.2	.1	228	146
NOV											
21...	1000	2.0	2.5	--	--	8.7	65	7.7	3.3	278	150
APR , 1976											
19...	0930	12.8	15.0	8.0	.98	6.5	66	7.6	4.5	256	168
JUN											
21...	1000	27.5	23.0	8.0	.58	11.9	142	8.6	.5	270	175

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
03...	8	3	38	8.6	1.2	142	0	117	23	2.5	.40
JUN											
26...	20	5	27	8.0	1.0	73	12	80	17	1.2	.46
NOV											
21...	9	2	31	8.2	2.6	90	6	84	16	2.1	.40
APR , 1976											
19...	9	7	31	8.0	2.7	112	0	92	19	1.6	.62
JUN											
21...	9	5	35	8.7	2.6	123	0	101	19	1.8	1.2

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
03...	2.1	.23	.01	2.7	.12	.06	17	--	0	0	38000
JUN											
26...	.74	.01	.01	1.2	.06	.01	10	--	--	--	--
NOV											
21...	1.7	.16	.15	2.3	.08	.03	12	--	120	180	7400
APR , 1976											
19...	.98	.00	.00	1.6	.08	.00	7.5	--	7	5	--
JUN											
21...	.58	.01	.01	1.8	.11	.03	13	--	26	810	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
03...	8	50	19	29	70	.0	8000	--	77	85
JUN										
26...	--	--	--	--	--	--	--	--	--	--
NOV										
21...	17	96	21	27	65	.0	13600	--	360	69
APR , 1976										
19...	--	--	--	--	--	--	--	--	--	--
JUN										
21...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
03...	1045	-5.0	1.0	--	--	.6	4	7.3	12	320	191
JUN											
26...	1030	28.0	26.0	--	--	10.5	131	8.9	.2	233	146
NOV											
21...	1030	2.0	2.5	--	--	7.8	59	7.7	3.3	268	160
APR , 1976											
19...	0940	13.9	14.0	8.0	.98	7.4	73	7.6	4.5	251	164
JUN											
21...	1015	27.5	23.0	8.0	.64	11.8	140	8.7	.4	275	175

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
03...	4	3	43	8.6	1.5	144	0	118	23	1.9	.40
JUN											
26...	16	3	31	8.0	1.0	86	6	81	17	1.3	.20
NOV											
21...	8	2	32	8.0	2.7	91	6	85	17	2.4	1.0
APR , 1976											
19...	5	4	31	8.0	2.6	111	0	91	19	1.7	.80
JUN											
21...	8	5	35	9.5	2.6	122	0	100	18	1.4	.72

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
03...	1.5	.21	.01	2.1	.10	.02	41	--	0	0	13000
JUN											
26...	1.1	.01	.00	1.3	.05	.01	4.9	--	--	--	--
NOV											
21...	1.4	.11	.11	2.5	.06	.02	13	--	72	130	7800
APR , 1976											
19...	.90	.00	.00	1.7	.08	.00	12	--	11	5	--
JUN											
21...	.68	.02	.01	1.4	.10	.02	11	--	84	83	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
03...	15	71	16	55	90	.1	11000	--	64	98
JUN										
26...	--	--	--	--	--	--	--	--	--	--
NOV										
21...	13	87	20	28	60	.0	10400	--	110	72
APR , 1976										
19...	--	--	--	--	--	--	--	--	--	--
JUN										
21...	--	--	--	--	--	--	--	--	--	--

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	TIME	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	RESERVOIR DEPTH (FEET)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SPECIFIC CONDUCTANCE (MICROMHOS)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
FEB , 1975											
03...	1130	-5.0	1.0	--	--	.8	6	7.3	11	315	189
JUN											
26...	1100	28.0	26.0	--	--	10.2	128	9.1	.1	227	139
NOV											
21...	1100	2.0	2.5	--	--	4.6	35	7.7	3.2	265	160
APR , 1976											
19...	0950	15.0	14.0	7.0	.98	7.6	75	7.6	4.5	249	163
JUN											
21...	1030	27.5	23.5	8.5	.64	12.0	143	8.7	.4	272	176

DATE	SOLIDS, SUSP. TOTAL, RESIDUE AT 110 DEG. C (MG/L)	TURBIDITY (JTU)	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SILICA, DISSOLVED (MG/L AS SIO2)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
FEB , 1975											
03...	7	3	37	8.9	1.3	142	0	117	24	2.6	.90
JUN											
26...	12	3	38	7.9	1.1	79	8	78	17	1.4	.64
NOV											
21...	7	2	38	8.0	2.6	100	--	82	18	2.3	.90
APR , 1976											
19...	--	5	30	8.0	2.6	111	0	91	19	1.7	.85
JUN											
21...	15	3	33	8.8	2.4	118	0	97	18	1.5	.87

Table 1.--Water-quality data for Schmidt, Hornbeam, and Horseshoe Lakes, Dakota County, Minn.--Continued

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE (MG/L)	COLIFORM, FECAL, 0.45 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, (COLS. PER 100 ML)	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)
FEB , 1975											
03...	1.7	.20	.02	2.8	.08	.02	11	--	0	0	15000
JUN											
26...	.76	.01	.00	1.4	.08	.01	5.3	--	--	--	--
NOV											
21...	1.4	.11	.11	2.4	.07	.03	13	--	60	100	7800
APR , 1976											
19...	.85	.00	.00	1.7	.08	.00	18	--	5	6	--
JUN											
21...	.63	.02	.00	1.5	.09	.02	12	--	50	88	--

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	CARBON, ORGANIC TOT. IN BOTTOM MAT. (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG)	NITROGEN, TOT IN BOTTOM MATERIAL (MG/KG AS N)	OIL AND GREASE, TOTAL IN BOTTOM MATERIAL (MG/KG)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
FEB , 1975										
03...	10	54	16	26	50	.0	13000	--	110	118
JUN										
26...	--	--	--	--	--	--	--	--	--	--
NOV										
21...	15	93	22	32	80	.0	13000	--	240	68
APR , 1976										
19...	--	--	--	--	--	--	--	--	--	--
JUN										
21...	--	--	--	--	--	--	--	--	--	--

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