

Valentine Lake (62-0071) Rice Creek Watershed District

Valentine Lake is located within the City of Arden Hills in Ramsey County. The lake has a surface area of 60-acres and a maximum and mean depth of 4.0 m (13.1 feet) and 1.5 m (4.9 feet), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The volume of the lake is approximately 300 ac-ft. The drainage area of the lake is approximately 2,237 acres. Therefore, the watershed-to-lake area ratio is 37:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 13 times in 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	65.2	33.0	89.0	C
CLA ($\mu\text{g/l}$)	16.8	5.4	71.0	B
Secchi (m)	1.8	0.8	3.2	C
TKN (mg/l)	1.67	1.10	2.00	
			Lake Grade	C

The lake received a lake grade of C for 2008, which is consistent with the historical water quality database. The TP grade returned to a C from last year's D grade. On the basis of the historical database, the lake appears to be represented by a lake grade of C. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

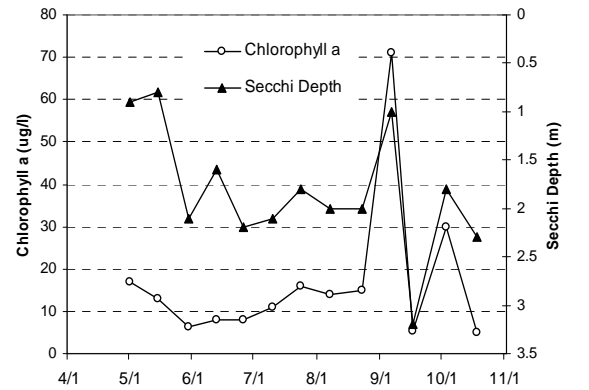
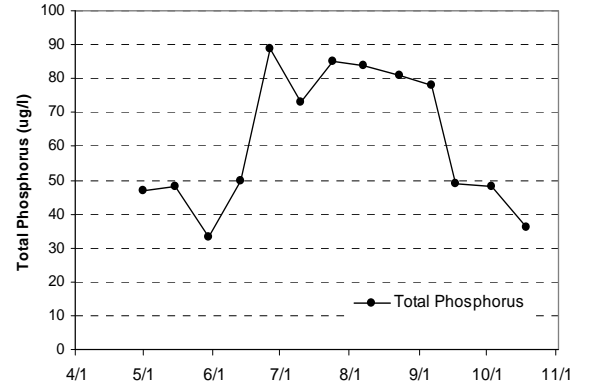
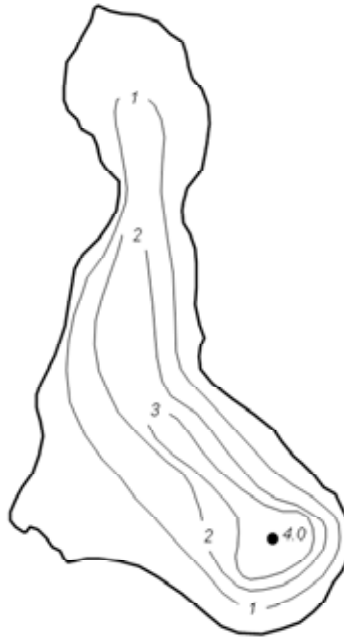
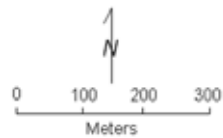
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.0 ("some algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Valentine Lake
Arden Hills, Ramsey Co.

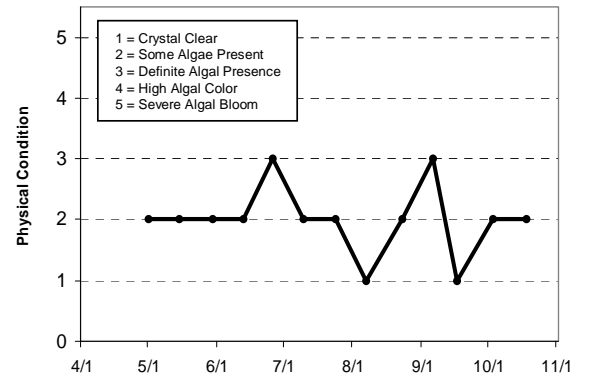
Lake ID: 620071
WD: Rice Creek
Volunteer: Bob Kistler

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	11.2				17	47		0.9	2	1
5/15	17.6				13	48		0.8	2	1
5/30	17.6				6.3	33		2.1	2	4
6/13	20.9				7.9	50		1.6	2	4
6/26	26.1				7.9	89		2.2	3	4
7/10	25.4				11	73		2.1	2	4
7/24	25.5				16	85		1.8	2	4
8/7	26.5				14	84		2	1	4
8/23	24.1				15	81		2	2	4
9/6	20.5				71	78		1	3	4
9/17	19.6				5.4	49		3.2	1	4
10/3	16.4				30	48		1.8	2	4
10/18	12.6				4.9	36		2.3	2	4



Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus										C	C	C
Chlorophyll a										B	B	C
Secchi Depth										C	C	D
Lake Grade										C	C	C

Year	2004	2005	2006	2007	2008
Total Phosphorus	C	C	C	D	C
Chlorophyll a	C	C	B	C	B
Secchi Depth	C	C	C	C	C
Lake Grade	C	C	C	C	C

Source: Metropolitan Council and STORET data

