

Minnesota DNR Waters Field Survey Report

Project SARAH LAKE		Lake No. 27-191	
City GREENFIELD	County HENNEPIN		Req. No. 2004-20
Sec. 1, 2 & 3; 34, 35	Twp. 118; 119	Rng. 24	Watershed NO. FORK CROW RIVER

SURVEY DATE: 9/22 & 9/23/03

SURVEY CREW: Scherek, Oschwald

LAKE SIZE

Meandered Area 604 Acres Non-meandered
 Planimetered Area 586 Acres Unknown

DATUM ADJUSTMENT

Assumed 1912 1929 1988 Source: DNR Waters

CONTROL BENCHMARK

Location: at Penney residence (SE-NE-SW-NW, Sec. 1-118-24)
 Elevation: 2003 gauge zero = 975.33, G.R.= 4.09, Water level = 979.42, 9/23/03
 Description: temporary staff gauge

SURVEY WORK COMPLETED

levels topography cross sections profiles OHW
 establish benchmarks outlet elevations other: photographs

WATER LEVELS

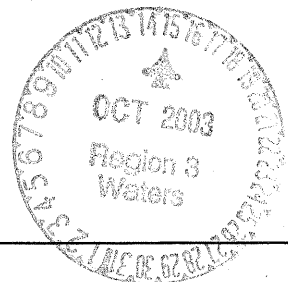
Highest Recorded: 982.40, 6/28/02 Water Surface: 979.42, 9/23/03
 Lowest Recorded: 977.80, 8/4/77 OHW Elev: 979.9
 Range: 4.60' (period of record, Highest Known: 982.7 (faint stainline on two trees)
 1/19/42 to present)

OUTLET

General Description: on NW side of lake (SW-NW, Sec. 34-119-24), via a ridge at an old abandoned R.R. grade, thence W-NW via a ditch (Sarah Creek)
 Runout Elevation and Description: 979.3, top of low ridge at old railroad grade

BENCHMARKS SET

Location:
 Elevation:
 Description:
 Location:
 Elevation:
 Description:



Prepared By John M. Scherek <i>JMS</i>	Title S.C.S.	Date 10/13/03
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Following are the elevations we found at the outlet on 9/22/03:

Water level, Sarah Lake	979.43
0+00 Bottom in lake	977.2
0+06 Bottom in lake (at toe of scattered loose boulders)	978.4
0+14 Channel bottom at low ridge/old abandoned R.R. grade (present runout)	979.3
0+20 Channel bottom	979.0
0+30 Channel bottom	978.8
0+40 Channel bottom	978.8
0+50 Channel bottom	978.6
0+67 Channel bottom at a small pooled area downstream of low ridge	978.1
Water level in pooled area	978.49

Note: The above portion of our profile followed the main flow channel thru the low ridge at the abandoned railroad grade. There were also two other areas where outflow is presently occurring, one 5' left of the one we profiled and one 11' right over the top of some loose bog.

0+92 Channel bottom at downstream side of pooled area	977.0
1+04 Channel bottom	977.1
1+14 Top of a heavy accumulation of vegetation in the channel	978.5
1+17 Channel bottom at downstream side of accumulation	976.9
1+42 Channel bottom	976.7
1+58 Channel bottom (at the upstream side of another heavy accumulation of vegetation)	976.5
Water level at same location	978.44
1+74 Top on accumulation of vegetation	978.2
1+98 Top on accumulation	978.0
Channel bottom below accumulation	975.9
2+30 Channel bottom	977.2
2+62 Channel bottom	976.9
3+12 Channel bottom	976.9
4+12 Channel bottom	975.9
≈ 4+87 Top upstream end of 60" R.C.P thru railroad grade	980.81
Top of heavy accumulation of vegetation at upstream end of culvert	977.9
Flowline (on rocks) below vegetation	976.6
Headwater at railroad grade	978.28
Top downstream end of 60" R.C.P.	980.31
Downstream flowline	977.1
Tailwater at railroad grade	978.29
Ditch bottom 100' downstream of railraod culvert	975.4

Note: The stationing from the pooled area downstream to the railroad is only approximate, as the rodman was measuring along the edge of the channel on floating vegetation and walking was precarious.

At Station 0+20 of our profile we obtained the following cross section:

0+00 Top of left bank	981.1
0+03 Toe of left bank	980.3
0+08 Channel bottom	979.9
0+10 Channel bottom	979.2
0+13 Channel bottom	979.4
0+15 Toe of right bank	979.0
0+17 Top of right bank	980.4
0+24 General low in cattail vegetation	979.1
0+33 General in cattail vegetation	980.4

Note: This cross section defines the low flow channel only. At high water, outflow would occur over a much larger area mostly to the right of the low flow channel.

The outlet of Sarah Lake has been surveyed twice previously. On Jan. 19, 1942 a DNR waters survey found the runout to be 977.3 and on Aug. 5, 1974 a Hennepin County survey found the runout to be 977.9; on both occasions at the approximate same location as the present runout. The present runout is 1.4' higher than the 1974 runout, so there has been some appreciable sediment buildup over the past 29 years.

In May of 1974 the N.O.H.W. level of Sarah Lake was determined to be 979.5. The lake has been actively gauged since 1994 and over that 10 year period the average of all the recorded levels is 980.22. In 9 of those 10 years the highest recorded level has been 980.5 or higher; the highest recorded being 982.40. Our present survey of the outlet suggests that these higher levels are at least partially due to the sediment buildup/higher runout and the restricted nature of the outlet channel between the lake and the existing railroad grade.

However, when we completed an O.H.W.L. investigation of the protected wetland downstream of Sarah Lake (Basin 27-365), thru which the Sarah Lake outlet ditch runs, we found the best evidence to indicate an O.H.W. level of 979.8; 0.3' higher than the previously determined N.O.H.W. level of Sarah Lake. This prompted us to re-examine the shoreline of Sarah Lake.

We recorded ground elevations at 22 trees (oak, elm, ash, basswood, cottonwood & willow). The average reduced elevation of the 8 best trees indicates an O.H.W. level of 979.9. We also recorded a washline at 980.2 (one location only) and stainlines at 981.8, 982.3 and 982.7. After considering all of the additional evidence at Sarah Lake and the downstream wetland, the appropriate O.H.W. level of Sarah Lake is 979.9.

At this time we also checked the shoreline for any low lying primary structures with respect to the highest known water level of 982.7. The three lowest structures we found had first floor elevations of 983.0 (4520 Shady Beach Circle), 983.4 (6435 No. Shore Drive) and 984.4 (6405 No. Shore Drive). The remaining primary structures all appeared to be at least 985.4 or higher.