



January 16, 2009

Ms. Janell Miersch, Area Hydrologist
Metro Region of Waters
Department of Natural Resources
1200 Warner Road
St. Paul, Minnesota 55106

Prior Lake Outlet Annual Operations Report, Year 2008

Dear Ms. Miersch:

Here is the District's Annual Outlet Operations report.

If you have questions or need additional information, please contact us.

Sincerely,

Stacy Sass
Water Resources Technician

Attachment: Prior Lake Outlet Annual Operations Report, Year 2008

CC with Attachment:

PLSLWD Board Members
Mike Kinney, PLSLWD
Ed Matthiesen, Wenck Associates
Terry Schwalbe, LMRWD
Scott County Commissioners
Paul Nelson, Scott County Natural Resources
Pete Beckius, Scott SWCD
Greg Spoden, State Climatology Office

Frank Boyles, City of Prior Lake
Steve Millar, City of Prior Lake
Steve Albrecht, City of Prior Lake
Ross Bintner, City of Prior Lake
Stan Ellison, SMSC
Mark McNeill, City of Shakopee
Bruce Loney, City of Shakopee

Outlet Operations, Prior Lake, Year 2008

On April 9, 2008, advance notice was given regarding the anticipated opening of the outlet structure, to the City of Prior Lake, City of Shakopee, Shakopee Mdewakanton Sioux Community and the Minnesota DNR. Prior Lake water was discharged through the outlet structure and channel at various intervals between the dates of April 9, 2008 and June 23, 2008 for a total of 74.91 days.

On April 9, 2008 the lake level was 902.47 ft and the outlet was partially opened in anticipation of rising waters. Beginning April 11, 2008, the lake level was 902.67 ft and the outlet was farther opened. The outlet was operated at this rate, about 95% capacity, until it was closed completely on May 28, 2008 with the lake level at 902.48 ft. Due to rising waters the outlet was again opened, to 95% capacity on June 12, 2008 with the lake level at 902.82 ft. The outlet was closed June 16, 2008 due to channel maintenance and was opened again June 18, 2008 to about 50% capacity with the lake level at 902.69 ft. The outlet was closed for the year on June 23, 2008 with the lake level at 902.51 ft.

After June 23, 2008, the level of Prior Lake continued to decline and dropped below the permitted outlet elevation (902.50 ft). The outlet was not operated during the remainder of the year.

Under most circumstances, the District has some control of the Prior Lake elevation by discharging water from the artificial outlet, to the outlet channel, and northerly to the Minnesota River. (Prior Lake was a landlocked basin until the outlet became operational in the early 1980s).

Before and during operation in the spring, the outlet channel system was inspected and determined to be in acceptable condition for the discharge of water in the amounts reasonably anticipated. The elevations of Prior Lake became high enough (generally above 902.50 ft) early in the year to require that water be released. Based on field measurements and estimations, a volume of 4,993 acre-feet of water was discharged from Prior Lake during calendar year 2008. Annual discharge volumes are largely weather-dependent and are variable as noted below:

- 1,395 acre-feet, year 2007
- 4,331 acre-feet, year 2006
- 2,299 acre-feet, year 2005
- 13 acre-feet, year 2004
- 5,921 acre-feet, year 2003
- 9,520 acre-feet, year 2002
- 8,692 acre-feet, year 2001
- 80 acre-feet, year 2000

The channel also receives surface drainage along its 7-mile northerly course to the Minnesota River. Those added volumes are not included in the above-listed discharges from Prior Lake. Most of that additional surface runoff to the channel originates outside of (north of) the jurisdictional boundary of the District. The District and other users of the Prior Lake outlet channel have an agreement in place to provide for the parties' joint construction, use, operation and maintenance of the outlet channel. The parties involved

are the City of Prior Lake, the City of Shakopee, the Shakopee Mdewakanton Sioux Community, and the Prior Lake-Spring Lake Watershed District.

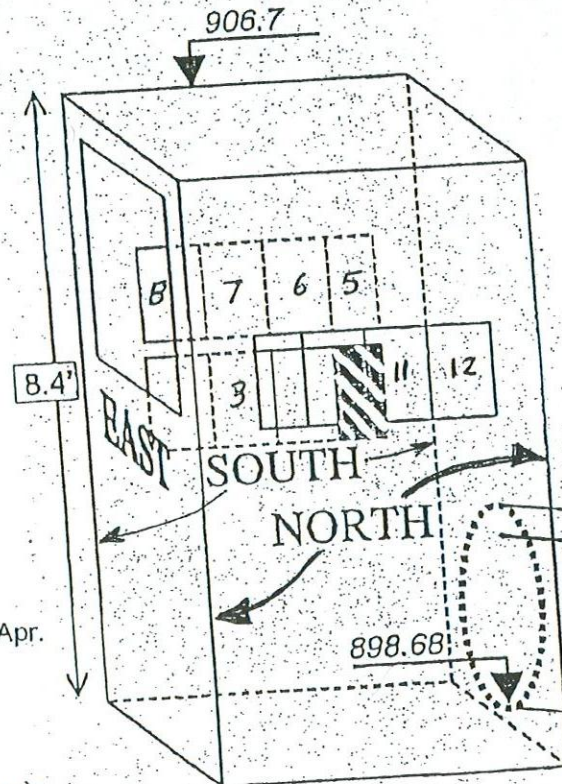
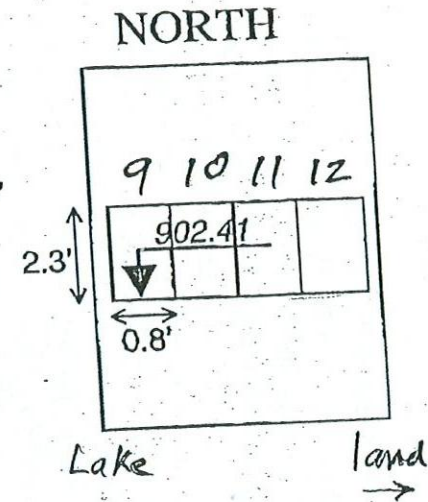
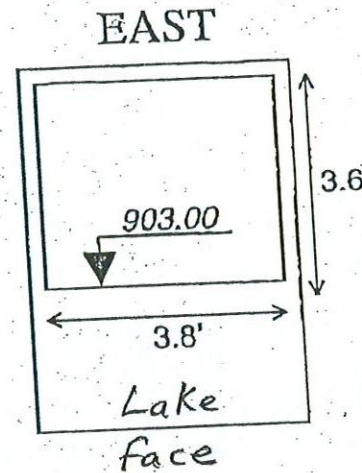
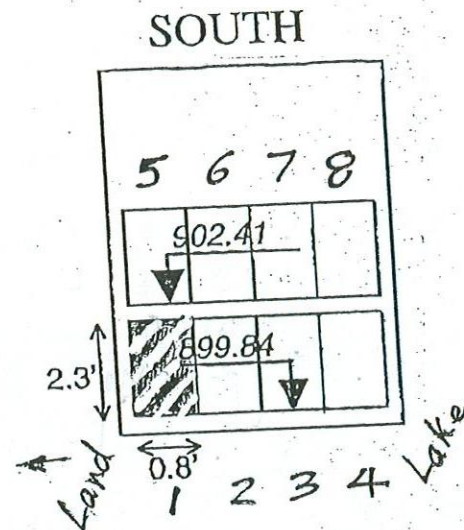
The Prior Lake outlet structure is shown in Attachment A. This structure was built in the early 1980s; the District has plans to replace it. Attachment B summarizes the outlet operations for the year. There is an established flow-discharge relationship for the Prior Lake outlet, as shown in Attachment C. The table of Attachment D and the graph of Attachment E summarize Prior Lake levels, the operation of the outlet, and records of precipitation. Attachment F shows the recorded levels of Spring Lake; this is the second largest lake in the District and drains into Prior Lake. There are nine other, smaller lakes in the District; seven of them drain ultimately to Prior Lake.

The District received an average of 23.88 inches of precipitation during 2008; this is below the annual average of 29 inches. Attachment G and H summarize measurements representative of the precipitation received. Precipitation, as received at the PLSLWD office, is also shown on the Prior Lake levels graph of Attachment E.

Attachments:

- A. Prior Lake Outlet
- B. Prior Lake Outlet Operations
- C. Flow Discharge Relationship, Prior Lake
- D. Prior Lake Elevation Recordings, with Precipitation.
- E. Prior Lake Elevations Graph
- F. Spring Lake Elevations
- G. Summary of Precipitation for Several Locations within PLSLWD
- H. Precipitation Recorded at PLSWLD Office

Attachment A PRIOR LAKE OUTLET



- 908.9 100yr FLOOD
- 905.68 Max Recorded

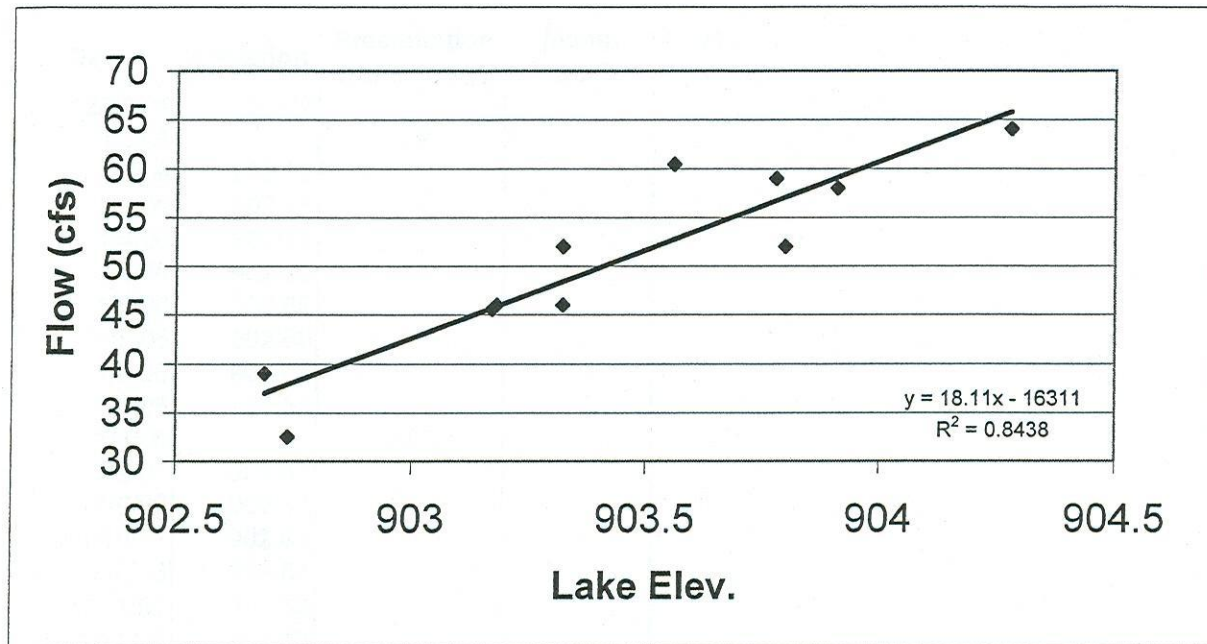
Desired Range:
902.5 - 904.

Begin discharge at 903.5
 902.5 - no discharge below this, but down to 902.0 in Mar - Apr.
 Zone 1 begin discharge at 903.5
 (If you get at (or near!), 903.5, open 'er up)
 Zone 2 discharge allowed above 902.5
 Zone 3 Mar - Apr: can discharge above 902.0
 Zone 4 no discharge below 902.5, except (go to zone 3, above)

Attachment B
Prior Lake Outlet Operations, Year 2008

Date	Elevation	Activity	# of days discharging	Flow Rate cfs	Volume (ac*ft)
4/9/2008		Notice of likely opening of outlet Closed until April 9			
4/9/08 17:00	902.47	Removed one panel, on lower left			
4/11/08 14:15	902.67	Outlet opened (~95%)	1.89	7.2707	27.19
4/14/08 8:50	902.70	Outlet remains open, as above.	2.77	35.0522	192.88
4/15/08 7:10	902.75		0.93	35.9124	66.30
4/16/08 9:00	902.74		1.08	35.7403	76.29
4/17/08 8:30	902.74		0.98	35.7403	69.41
4/18/08 9:45	902.73		1.05	35.5683	74.22
4/21/08 8:15	902.75		2.94	35.9124	209.24
4/22/08 9:05	902.78	Removed 4 panels on North side	1.03	36.4285	74.76
4/23/08 9:05	902.77	Outlet remains open, as above.	1.00	36.2565	71.91
4/24/08 9:15	902.84		1.01	37.4608	74.82
4/28/08 7:45	902.82		3.94	37.1167	289.88
4/29/08 12:45	902.81		1.21	36.9446	88.55
4/30/08 8:45	902.8		0.83	36.7726	60.78
5/2/08 9:10	902.76		2.02	36.0844	144.39
5/5/08 8:40	902.88		2.98	38.1490	225.43
5/6/08 10:00	902.88		1.06	38.1490	79.87
5/8/08 8:40	902.9		1.94	38.4930	148.46
5/9/08 8:10	902.9		0.98	38.4930	74.76
5/12/08 9:00	902.89		3.03	38.3210	230.67
5/19/08 8:00	902.82		6.96	37.1167	512.27
5/21/08 9:40	902.75		2.07	35.9124	147.41
5/23/08 8:50	902.68		1.97	34.7081	135.29
5/27/08 9:25	902.54		4.02	32.2994	257.82
5/28/08 8:30	902.48		0.96	31.2672	59.65
5/28/08 9:00	902.48	Outlet fully closed	0.02	31.2672	1.29
6/12/08 16:00	902.82	Outlet opened fully	15.29	37.1167	1125.77
6/13/08 8:00	902.82	Outlet remains open, as above.	0.67	37.1167	49.08
6/16/08 8:20	902.75		3.01	35.9124	214.68
6/16/08 15:30		Outlet fully closed	0.30	0.0000	0.00
6/17/08 8:05	902.69	Outlet remains closed	0.69	0.0000	0.00
6/18/08 7:20	902.69	Outlet opened 50%	0.97	18.3580	35.27
6/19/08 8:05	902.66		1.03	18.0863	36.99
6/20/08 8:00	902.65		1.00	17.9957	35.57
6/23/08 8:00	902.55		3.00	17.0902	101.69
6/23/08 17:50		Outlet Closed	0.41	0.0000	0.00
6/24/08 8:00	902.51	Outlet remains closed	0.59	0.0000	0.00
Totals			74.91		4992.61

Attachment C: Flow-Discharge Relationship, Prior Lake

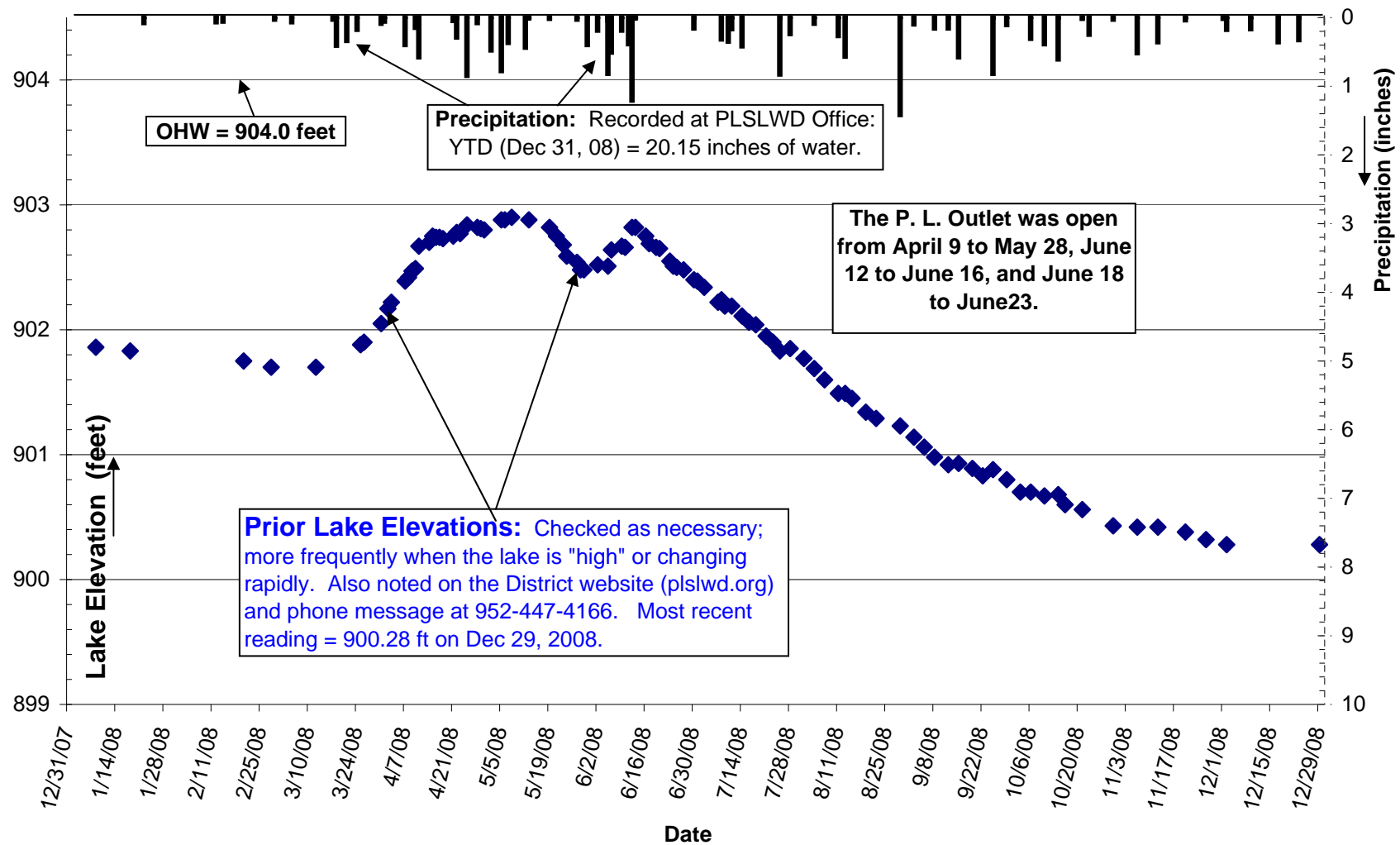


Attachment D:
Prior Lake Elevations with Precipitation

Year 2008	Prior Lake Elevation	Precipitation (office only)	Mo. Tot
1/8/2008	901.86		
1/18/2008	901.83		
1/22/2008		0.08	0.08
2/12/2008		0.07	
2/14/2008		0.06	
2/20/2008	901.75		
2/28/2008	901.70		
2/29/2008		0.03	0.16
3/5/2008		0.07	
3/12/2008	901.70		
3/17/2008		0.03	
3/18/2008		0.41	
3/21/2008		0.34	
3/24/2008		0.18	
3/25/2008	901.88		
3/26/2008	901.90		
3/31/2008	902.05	0.09	1.12
4/1/2008		0.06	
4/2/2008	902.17		
4/3/2008	902.22		
4/7/2008	902.39	0.40	
4/8/2008	902.42		
4/9/2008	902.47		
4/10/2008	902.49	0.15	
4/11/2008	902.67	0.58	
4/14/2008	902.70		
4/15/2008	902.75		
4/16/2008	902.74		
4/17/2008	902.74		
4/18/2008	902.73		
4/21/2008	902.75	0.05	
4/22/2008	902.78	0.29	
4/23/2008	902.77		
4/25/2008	902.84	0.85	
4/28/2008	902.82	0.08	
4/29/2008	902.81		
4/30/2008	902.80		2.46
5/2/2008		0.48	
5/5/2008	902.88	0.78	
5/6/2008	902.88		
5/7/2008		0.37	
5/8/2008	902.90		
5/12/2008		0.44	
5/13/2008	902.88	0.01	
5/19/2008	902.82	0.02	
5/21/2008	902.75		
5/23/2008	902.68		
5/24/2008	902.59		
5/27/2008	902.54	0.03	
5/28/2008	902.48		
5/29/2008	902.48		
5/30/2008		0.40	2.53
6/2/2008	902.52	0.19	
6/5/2008	902.51	0.04	
6/5/2008		0.82	
6/6/2008	902.64	0.51	
6/9/2008	902.67	0.19	
6/10/2008	902.66		
6/11/2008		0.39	
6/12/2008	902.82	1.21	
6/13/2008	902.82	0.01	
6/16/2008	902.75	0	
6/17/2008	902.69		
6/19/2008	902.66		
6/20/2008	902.65		
6/23/2008	902.55	0	
6/24/2008	902.51		
6/25/2008	902.5		
6/27/2008	902.48	0	
6/30/2008	902.4	0.16	3.52

Year 2008	Prior Lake Elevation	Precipitation (office only)	Mo. Tot
7/1/2008	902.39	0	
7/3/2008	902.34		
7/7/2008	902.22	0	
7/8/2008	902.24	0.32	
7/9/2008	902.19		
7/10/2008		0.35	
7/11/2008	902.19	0.17	
7/14/2008	902.11	0.42	
7/16/2008	902.06	0	
7/18/2008	902.04		
7/21/2008	901.95		
7/23/2008	901.9		
7/25/2008	901.83	0.83	
7/28/2008	901.85	0.24	2.33
8/1/2008	901.77		
8/4/2008	901.69	0.09	
8/7/2008	901.6		
8/11/2008	901.49	0.27	
8/13/2008	901.49	0.57	
8/15/2008	901.45		
8/19/2008	901.34		
8/22/2008	901.29		
8/29/2008	901.23	1.42	2.35
9/2/2008	901.14	0.1	
9/5/2008	901.06		
9/8/2008	900.98	0.16	
9/12/2008	900.92	0.16	
9/15/2008	900.93	0.58	
9/19/2008	900.89		
9/22/2008	900.83		
9/25/2008	900.88	0.82	
9/29/2008	900.80	0.11	1.93
10/3/2008	900.70		
10/6/2008	900.7	0.31	
10/10/2008	900.67	0.39	
10/14/2008	900.68	0.61	
10/16/2008	900.60		
10/21/2008	900.56	0.02	
10/23/2008		0.25	
10/30/2008	900.43	0.03	
11/6/2008	900.42	0.52	
11/12/2008	900.42	0.36	
11/20/2008	900.38	0.04	
11/26/2008	900.32		2.53
12/1/2008		0.02	
12/2/2008	900.28	0.18	
12/9/2008		0.17	
12/17/2008		0.36	
12/23/2008		0.33	
12/29/2008	900.28		
12/31/2008		0.08	1.14

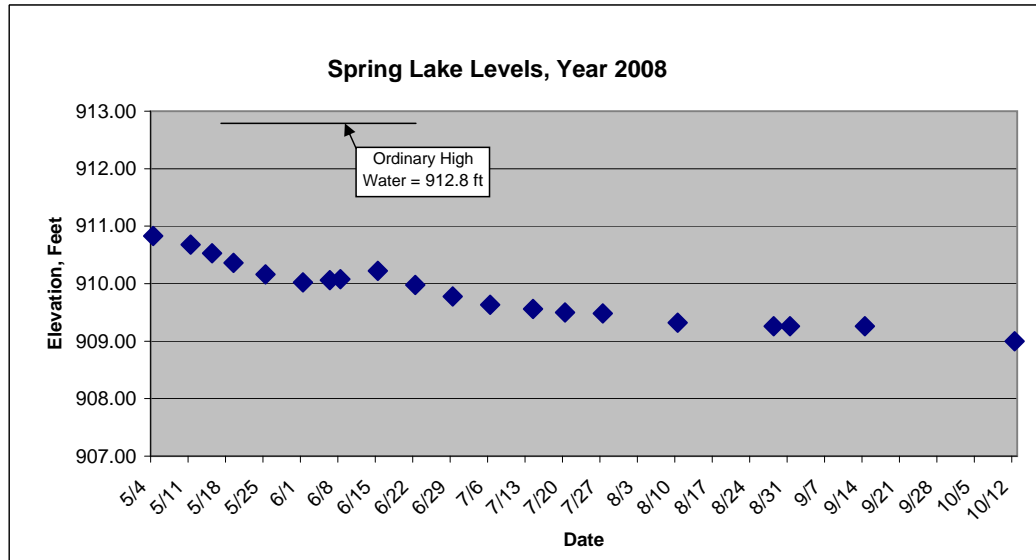
AVG	901.96	YTD	20.15
Min	900.28	Min	0
Max	902.90	Max	1.42



Attachment E: Prior Lake Elevations Graph

Attachment F: Spring Lake Levels

Date	Elevation
5/4/08	910.83
5/11/08	910.68
5/15/08	910.53
5/19/08	910.36
5/25/08	910.16
6/1/08	910.02
6/6/08	910.06
6/8/08	910.08
6/15/08	910.22
6/22/08	909.98
6/29/08	909.78
7/6/08	909.63
7/14/08	909.56
7/20/08	909.50
7/27/08	909.48
8/10/08	909.32
8/28/08	909.26
8/31/08	909.26
9/14/08	909.26
10/12/08	909.00
10/19/08	909.00
11/9/08	908.96
Zero elevation	905.28
Min	908.96
Max	910.83



**Attachment G: Summary of Precipitation for several
locations within PLSLWD**

(Inches of Water)

2008 <<<<<<< Within PLSLWD >>>>>>>

	Cohen	PLSLWD	Mueller	Schultz
Jan	0.16	0.08	0.14	0.10
Feb	0.52	0.16	0.23	0.00
Mar	2.58	1.12	1.28	1.72
Apr	3.09	2.46	3.74	2.95
May	2.82	2.53	2.86	3.06
Jun	3.78	3.52	3.71	4.18
Jul	3.54	2.33	2.94	3.38
Aug	2.44	2.35	3.11	3.06
Sep	2.26	1.93	1.92	1.95
Oct	1.52	1.61	1.90	2.00
Nov	1.48	0.92	1.48	1.36
Dec	1.78	1.14	1.37	0.96
YTD	25.97	20.15	24.68	24.72

Average=	23.88
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Attachment H: Precipitation Recorded at PLSLWD Office

2008 Precip - PLSLWD Office Gauge, Inches of precipitation as water.

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1				0.06								0.02
2					0.48	0.19						
3				0.4		0.03			0.1			0.18
4						0.01		0.09				
5			0.07		0.78	0.82					0.02	0.02
6			T			0.51				0.31	0.5	
7					0.37					0.13		
8							0.32		0.16	0.26		0.04
9						0.19			0.02			0.11
10				0.15			0.35					
11				0.58		0.39	0.17	0.13	0.14			
12		0.07			0.44	1.21		0.14			0.36	
13			T			0.01		0.55		0.3		
14		0.06			0.01			0.02		0.47	0.04	
15									0.58			
16												
17			0.03				0.41			0.01	T	0.36
18			0.41									
19												0.02
20					0.02					0.01		
21	0.08		0.34	0.05			0.01					
22				0.29								0.27
23									0.04	0.03		0.04
24			0.18				0.02		0.78			
25		T		0.85			0.81					
26									0.03	0.09		
27					0.03			0.4				
28		T		0.08				1.02				
29		0.03							0.08			
30					0.4	0.16						
31			0.09				0.24					0.08
Mo Tot	0.08	0.16	1.12	2.46	2.53	3.52	2.33	2.35	1.93	1.61	0.92	1.14
YTD	0.08	0.24	1.36	3.82	6.35	9.87	12.2	14.55	16.48	18.09	19.01	20.15