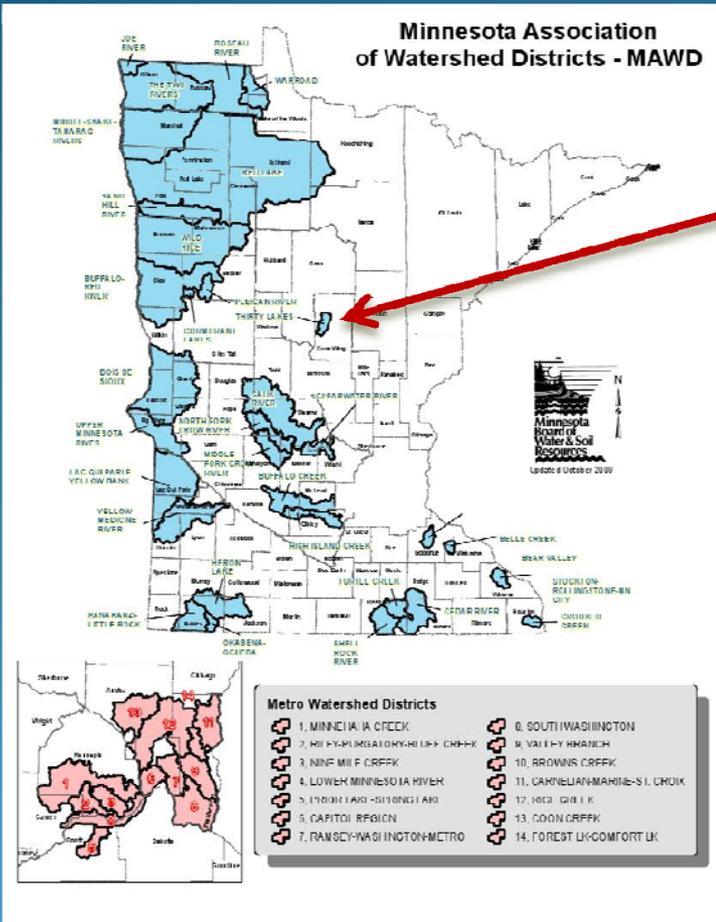


Persistence and Patience: A Case Study on a 25 Year Stormwater Project

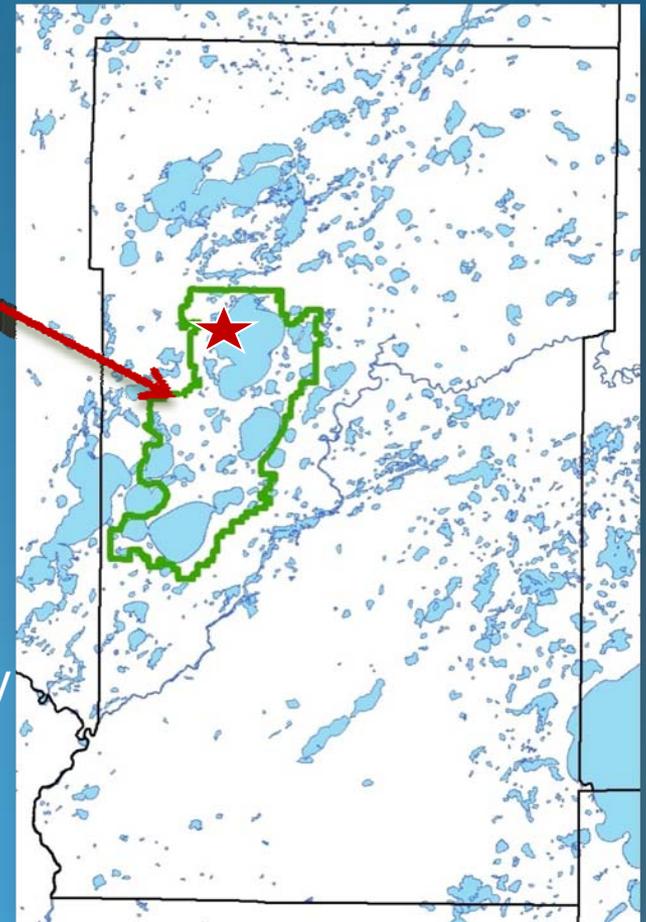
October 26, 2011

Pelican Lake



Thirty Lakes Watershed District

Crow Wing County



Breezy Point Resort



Breezy Point Resort



Downstream Flow



HISTORY OF THE BREEZY POINT RESORT STORMWATER PROJECT

- 3/13/1986 Thirty Lakes WD permit for a 5 year rain runoff control.
- 1986-1988 Retention Pond Constructed.
- 1988-1990 Retention Pond proved inadequate.
- 9/30/1995 Water Sampling taken, showing high levels of Phosphorus, TSS, Fecal.
- 8/31/2004 Pelican Lake Association requested immediate action by Thirty Lakes.
- 10/5/2004 Breezy Point City stated they will take charge of the project.
- Spring of 2006 Pelican Lake Association requested update and immediate action.
- 1/13/2007 Thirty Lakes WD meeting public to propose project of 100 yr rain event.
- Fall of 2007 Thirty Lakes WD moved to a 5 yr rain event with SWCD engineer.
- April 2008 Thirty Lakes WD collected multiple water samples over several days.
- 6/14/2008 Thirty Lakes WD held public meeting for SWCD plan of \$68,000.
- 9/22/2008 Thirty Lakes stated each entity would complete its own part of the project.
- 8/24/2009 Thirty Lakes WD public meeting with Westwood presented ideas on runoff.
- 10/29/2009 Thirty Lakes WD and CW SWCD applies for BWSR Grant.
- 4/12/2010 Thirty Lakes meeting, CW SWCD is awarded grant for this project, \$39,000.

Data

DATE	TP mg/l	TSS mg/l	CL mg/l	Oil/Grease mg/l	Fecal Coliform Col/100cc
9/30/1995	0.72	13.2			960
8/26/1999					2900
4/14/2008	0.157	63	20.4	7.5	
4/15/2008	0.217	138	44.5	6.99	
4/15/2008	0.205	73	28.0		
4/16/2008	0.107	35	7.44	5.14	
4/16/2008	0.150	44	10.7		
4/27/2008	0.131	72	133	<5	
4/27/2011	0.064	19.6	2.12	<5	
5/31/2011	0.082	6.0	5.05		
6/15/2011	0.059	13.2	1.06	<5	

Concerns and Benefits

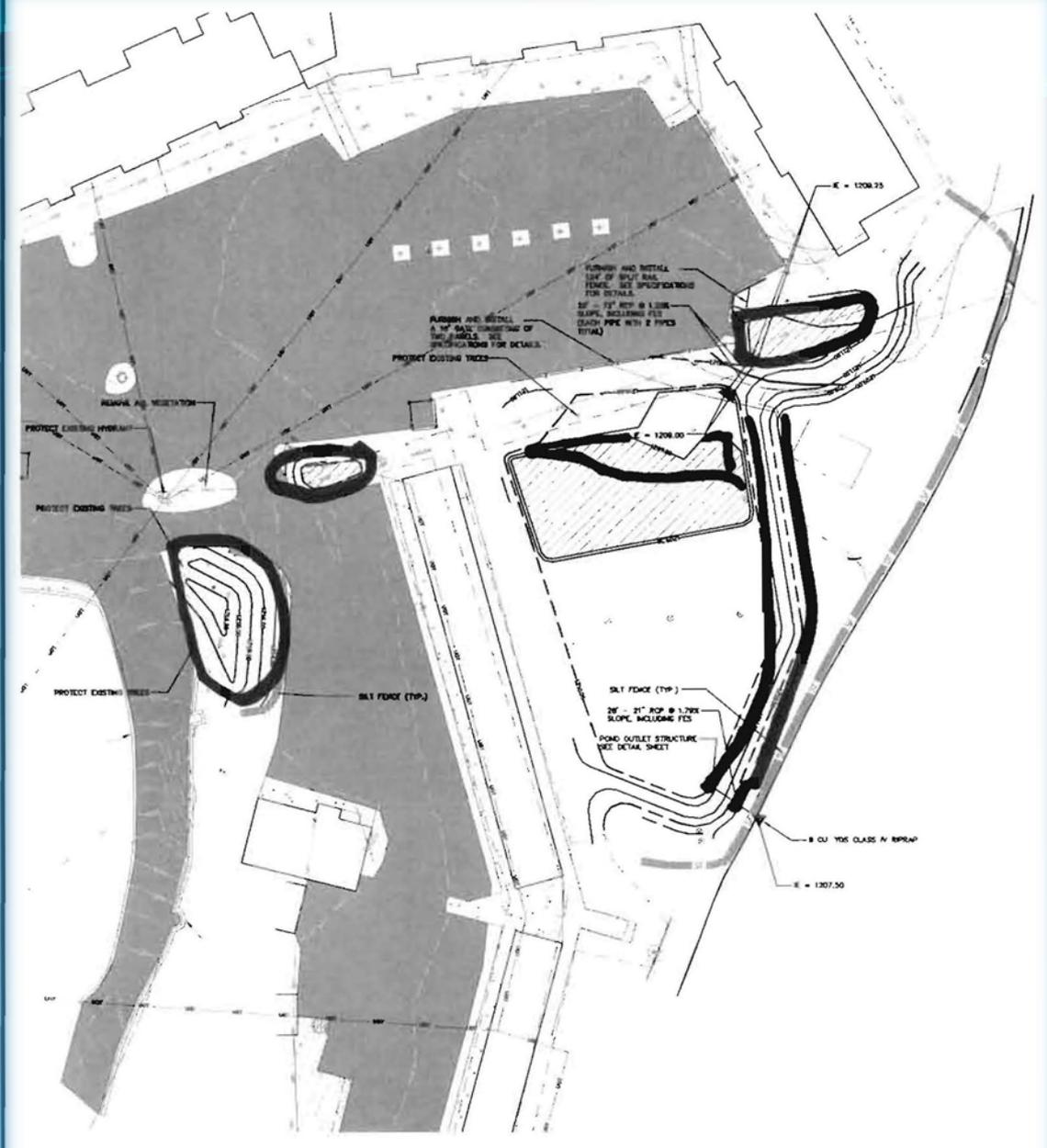
Concerns

- Snow Storage
- Parking for boat trailers
- Tree Impact Concerns

Benefits

- Increased Water Quality
- Increased Habitat
- Aesthetics
- Partnerships

Tim Ramerth
Of
Westwood
Professional
Services



Westwood Professional Services, Inc.
 7099 Annapolis Drive
 Eden Prairie, MN 55344
 PHONE 952-437-6198
 FAX 952-437-0823
 TOLL FREE 1-888-837-5199
 www.westwoodps.com

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed PROFESSIONAL ENGINEER under the laws of the State of Minnesota.
 Timothy V. Ramerth
 Date: 09/01/10 License No. 41966

Services	Design	Check	Draw	Record Drawing by/Date

Designed: TTR
 Checked: TTR
 Drawn: CMC
 Record Drawing by/Date: _____

Prepared for: The



- Woodland Rain garden
- Prairie Rain garden
- Perennial Rain garden
- Wet Meadow Rain garden
- Berm Garden
- Stormwater Runoff

Breezy Point Stormwater Project











QUESTIONS?