#### Salo Pond Alum Treatment System St Anthony Village, MN

Waukesha County / WLW Spring Stormwater Workshop

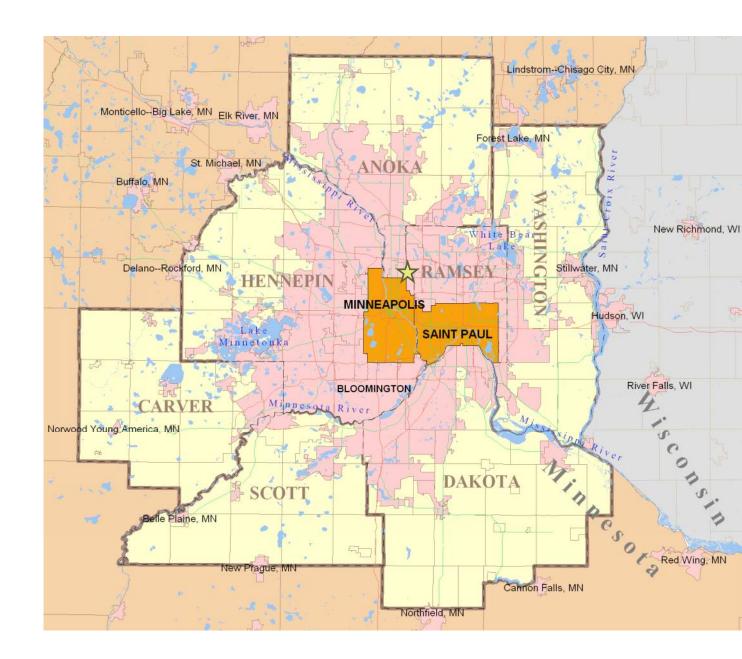
#### Overview

- Background/Silver Lake Nutrient TMDL
- Feasibly Study / Subwatershed Assessment
- Final Design
- Construction
- Performance Summary



#### Location

- Silver Lake
- St. Anthony Village, MN
- Rice Creek Watershed District



#### Silver Lake

- Lake Surface Area 72.5 acre
- Subwatershed Area 678.6 acre
- Outlets to Ramsey County Ditches to Rice Creek
- TMDL approved in 2010 for Excess Nutrients,
- St. Anthony Village Target Load Reduction 31.5 lbs TP
- Reductions in Watershed Load included
  - o Urban Retrofitting and Redevelopment
  - o Management & Education
  - o Regulatory Controls

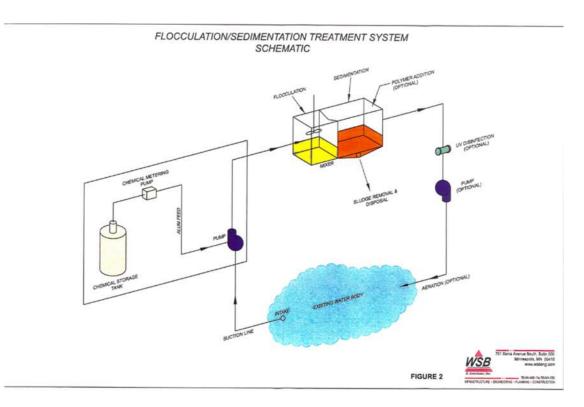


## Salo Ponds

- Located in Apache Subwatershed
- Apache Plaza has seen significant redevelopment in last 20 years.
- Modeled TP removal performance from Salo Ponds using P8:
  - o South Pond: 59%
  - North Pond 48%
  - o 29.9 lbs of TP Discharging to Silver Lake



#### Pond Alum Treatment System





Portable Flocculation Treatment System



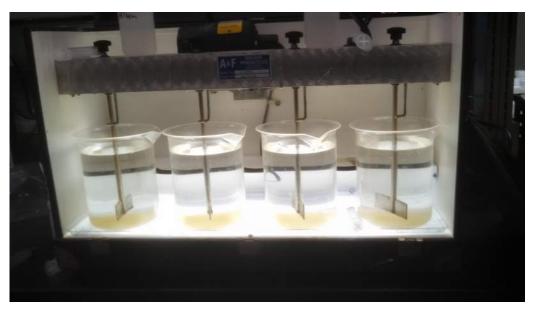
# Feasibility Study

- Removal of up to 27 lb/yr of TP
- Removes Dissolved Phosphorus
- Anticipated to achieve 85% of TMDL "P" reduction goal to Silver Lake
- Up to 45% of the project is grant funded (\$200,000 of \$450,000)
- Improved water Quality and Pond appearance of Salo Ponds

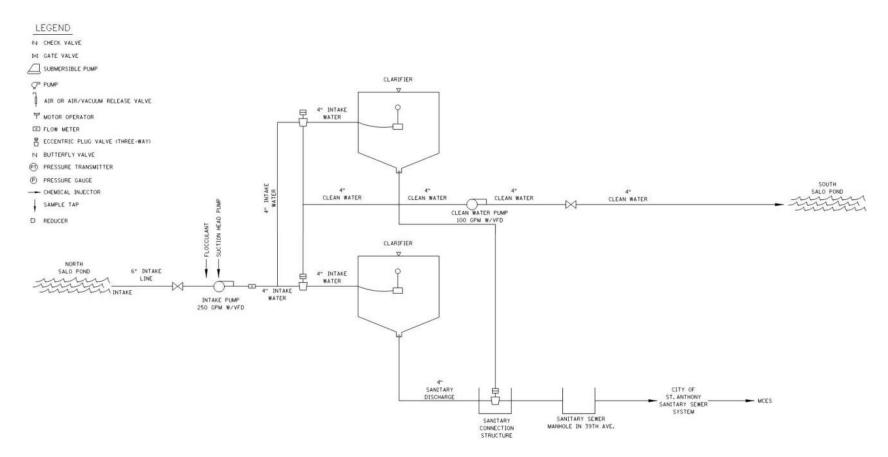


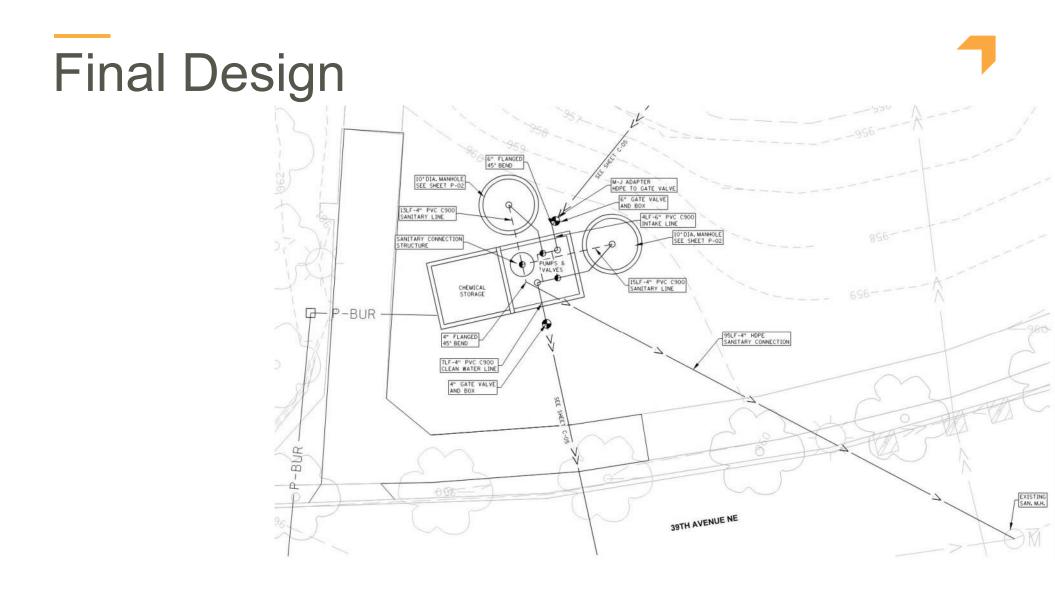
### Jar Testing

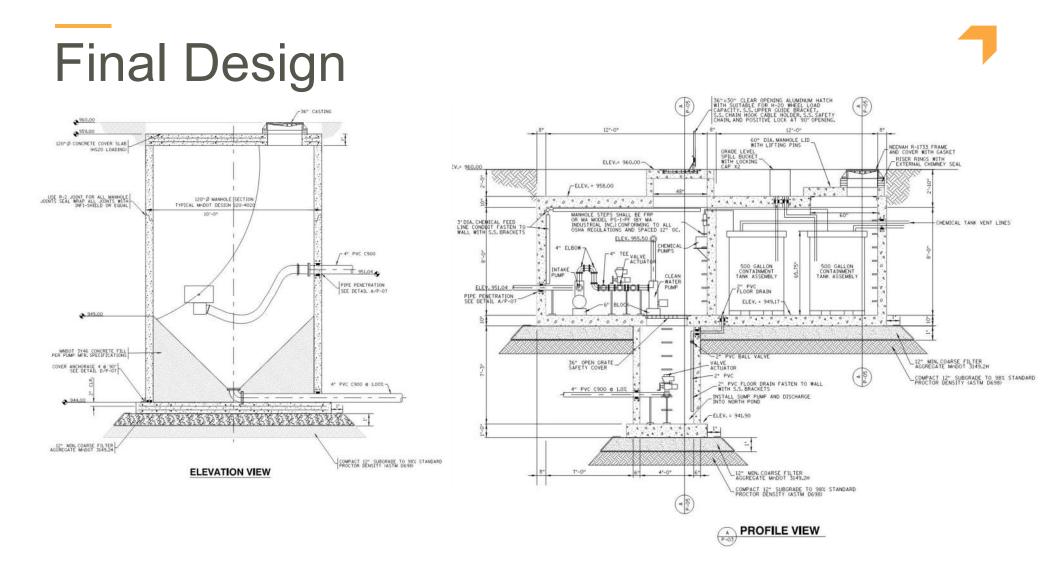
Salo Park Set One							
Product	Jar 1	Jar 2	Jar 3	Jar 4			
Aqua Hawk 4137	75 ppm	100 ppm	125 ppm	150 ppm			
Phosphate	0.08	0.06	0.03	0.03			



#### **Treatment System Schematic**













### System Startup

- Influent/Effluent Grab Samples
- 10 mins of settling





#### Results

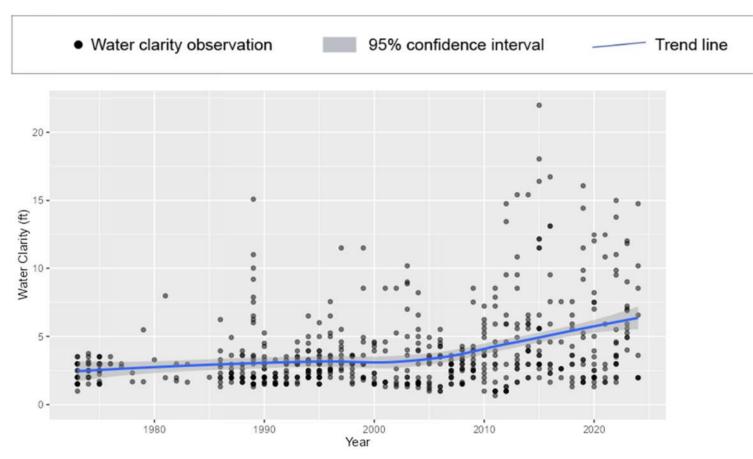
0.12 0.12 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Baseline - TMDL           Salo Goal           2017           2018           2019           2020           2021           2022 (Offline, no sampling)	[days] - - 103 164 129 36 29	[mg/L] 0.19 0.02 0.03 0.029 0.048 0.037 0.062	[lbs] 29.9 3.1 5.2 4.6 7.6 5.8	[lbs] 0 26.8 24.7 25.3 22.3 24.1	[%] 0% 97% 94% 95% 91%
	2017 2018 2019 2020 2021 2022 (Offline, no sampling)	103 164 129 36	0.03 0.029 0.048 0.037	5.2 4.6 7.6	24.7 25.3 22.3	94% 95%
	2018 2019 2020 2021 2022 (Offline, no sampling)	164 129 36	0.029 0.048 0.037	4.6 7.6	25.3 22.3	95%
	2019 2020 2021 2022 (Offline, no sampling)	129 36	0.048 0.037	7.6	22.3	
.1	2020 2021 2022 (Offline, no sampling)	36	0.037			91%
2	2021 2022 (Offline, no sampling)			5.8	24 1	
.1	2022 (Offline, no sampling)	29	0.062			93%
1			0.062	9.8	20.1	89%
1	0000					
1	2023	85	0.068	10.7	19.2	88%
	2024	0	0.035	5.5	24.4	94%
	2017-2024 Average	78	0.044	7.0	22.9	92%
06		_				

#### Salo Alum Treatment Performance Summary

Pre-Project Ave TP Conc. 019 mg/L

0.2

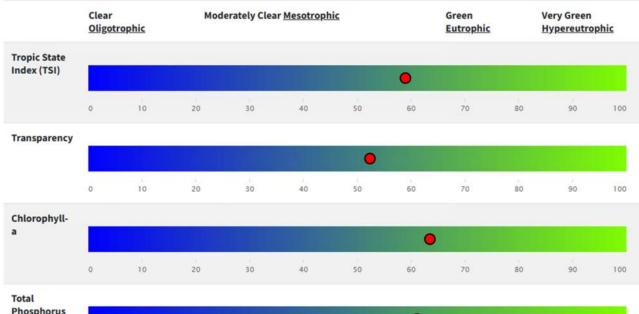
#### Silver Lake Update



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#### Silver Lake

Results Summarized through end of 2024 monitoring season.



Phosphorus							•				
	0	10	20	30	40	50	60	70	80	90	100

#### Overall Trophic State Index for this lake: 59

Parameters	10-Year average of all summer samples	Parameter TSI	Expected TSI range of lakes in same ecoregion	Number of samples
Transparency (meters)	2	52	43 - 54	130
Chlorophyll-a (parts per billion)	28	63	46 - 61	64
Total Phosphorus (parts per billion)	52	61	49 - 61	64



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