



Wastewater Reuse

Work Group Meeting, White Bear Lake Area Comprehensive Plan

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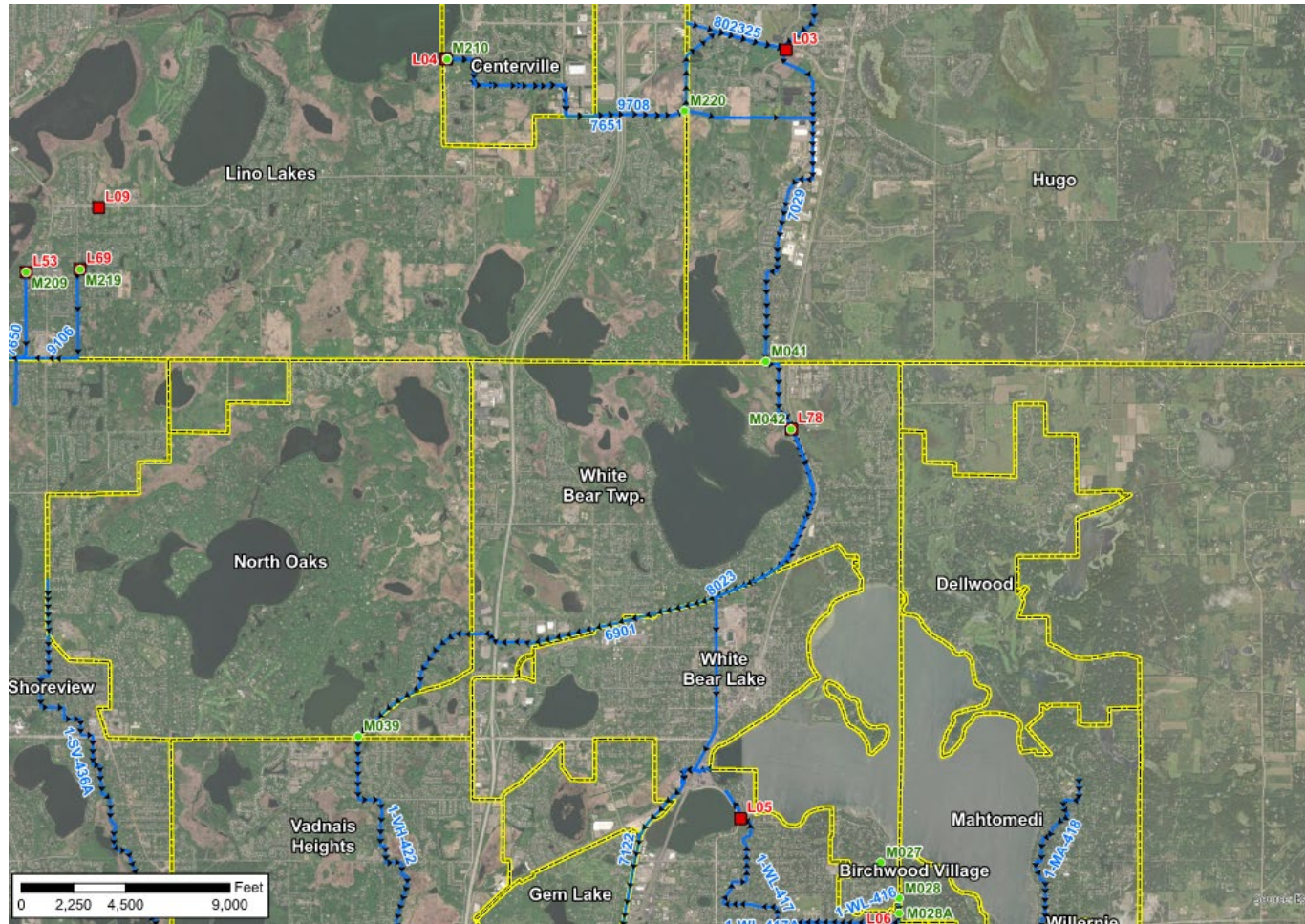
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Wastewater Reuse



- Capture wastewater coming through White Bear Lake Area area for reuse.
- Identify volume of wastewater available for reuse.
- Identify potential reuse customers.
 - High volume commercial/industrial users
 - High volume irrigation users
 - High volume private wells

Sewer Interceptors in Northeast Metro

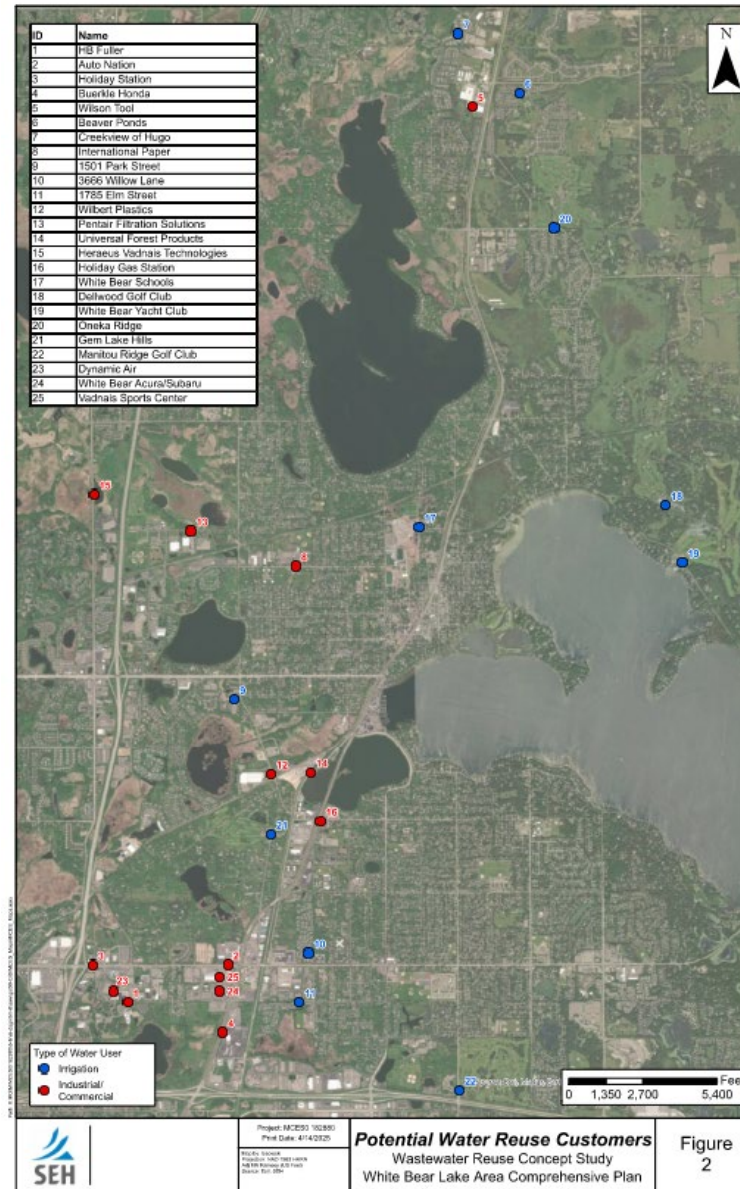


Wastewater Flows at Meter 041

	2021	2022	2023	2024
January	74.6	74.2	76.0	82.5
February	68.9	66.1	72.0	74.7
March	84.5	79.8	85.8	80.7
April	84.1	86.4	113.7	91.6
May	84.7	91.9	90.4	100.3
June	77.2	79.6	78.7	107.2
July	74.9	76.5	77.5	91.9
August	72.9	76.7	77.4	99.8
September	69.4	72.8	74.2	84.4
October	71.8	73.7	81.2	
November	70.9	72.4	78.0	
December	74.4	76.5	83.4	
Annual Total (million gallons):	908.3	926.6	988.3	

- Wastewater flow is 2.5 - 2.8 million gallons per day at M041 (Hugo/White Bear Township border)

Large Volume Water Users



Large Volume Water Users

- 0.17 MGD Commercial/Industrial Use

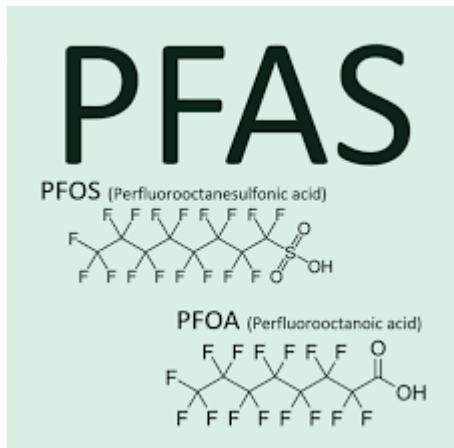
Large Water Users	City	Annual Commercial/Industrial Water Use (gal)	Irrigation Water Use (gal)
HB Fuller	Vadnais Heights	5,000,000	
Dyanamic Air Inc.	Vadnais Heights	3,100,000	
WB Acura Subaru	Vadnais Heights	3,000,000	
Vadnais Sports Center	Vadnais Heights	2,960,000	
Buerkle Honda	Vadnais Heights	2,300,000	
Buerkle Hyundai	Vadnais Heights	2,100,000	
Holiday Station (Co Rd E)	Vadnais Heights	1,900,000	
Wilson Tool	Hugo	5,600,000	
Beaver Ponds	Hugo		1,750,000
Creekview of Hugo	Hugo		1,300,000
International Paper	White Bear Lake	5,200,000	
1501 Park Street	White Bear Lake		4,200,000
3666 Willow Lane	White Bear Lake		3,600,000
1785 Elm Street	White Bear Lake		3,350,000
Wilbert Plastics	White Bear Twp	8,500,000	
Pentair Filtration Solutions	White Bear Twp	8,300,000	
Universal Forest Products	White Bear Twp	3,700,000	
Heraeus Vadnais Technologies	White Bear Twp	3,700,000	
Holiday Gas Station	White Bear Twp	2,800,000	
	Total:	60,560,000	14,200,000

Large Volume Private Wells

- 1.5 MGD of large-scale irrigation averaged over 90 days (large volume wells plus commercial irrigation)

Large Water Users	City	Annual Commercial/Industrial Water Use (gal)	Irrigation Water Use (gal)
White Bear Schools	White Bear Lake		1,500,000
Dellwood Golf Club	Dellwood		29,000,000
White Bear Yacht Club	Dellwood		27,000,000
Oneka Ridge	Hugo		25,000,000
Gem Lake Hills	White Bear Lake		15,800,000
Manitou Ridge Golf Club	White Bear Lake		25,000,000
		Total:	123,300,000

Raw Wastewater - Water Quality



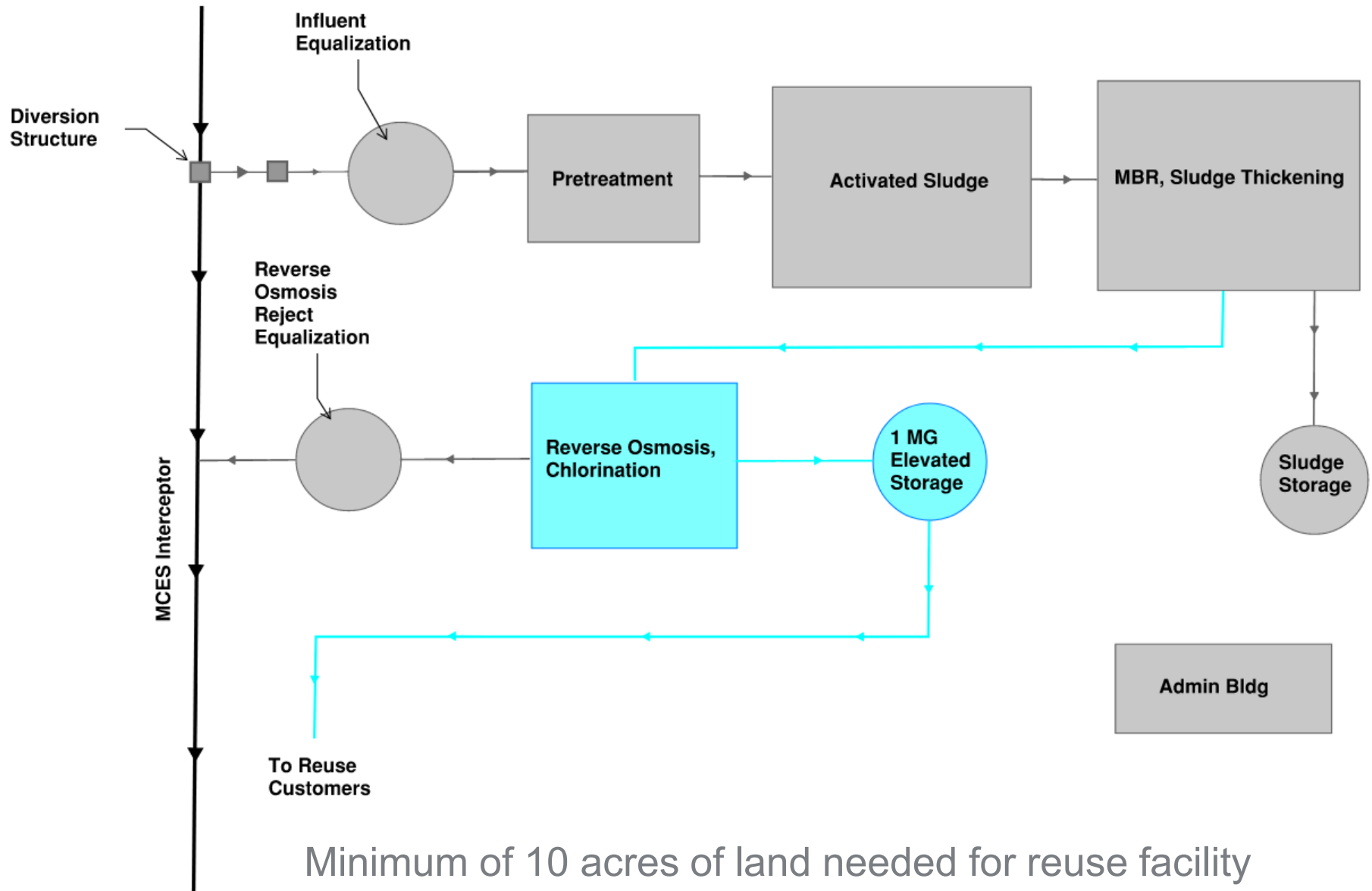
- 250 mg/L Biological Oxygen Demand
- 250 mg/L Total Suspended Solids
- 7 mg/L Phosphorus
- 40 mg/L Total Nitrogen
- 500 mg/L Chloride
- PFAS

Reclaimed Wastewater – Water Quality Goals

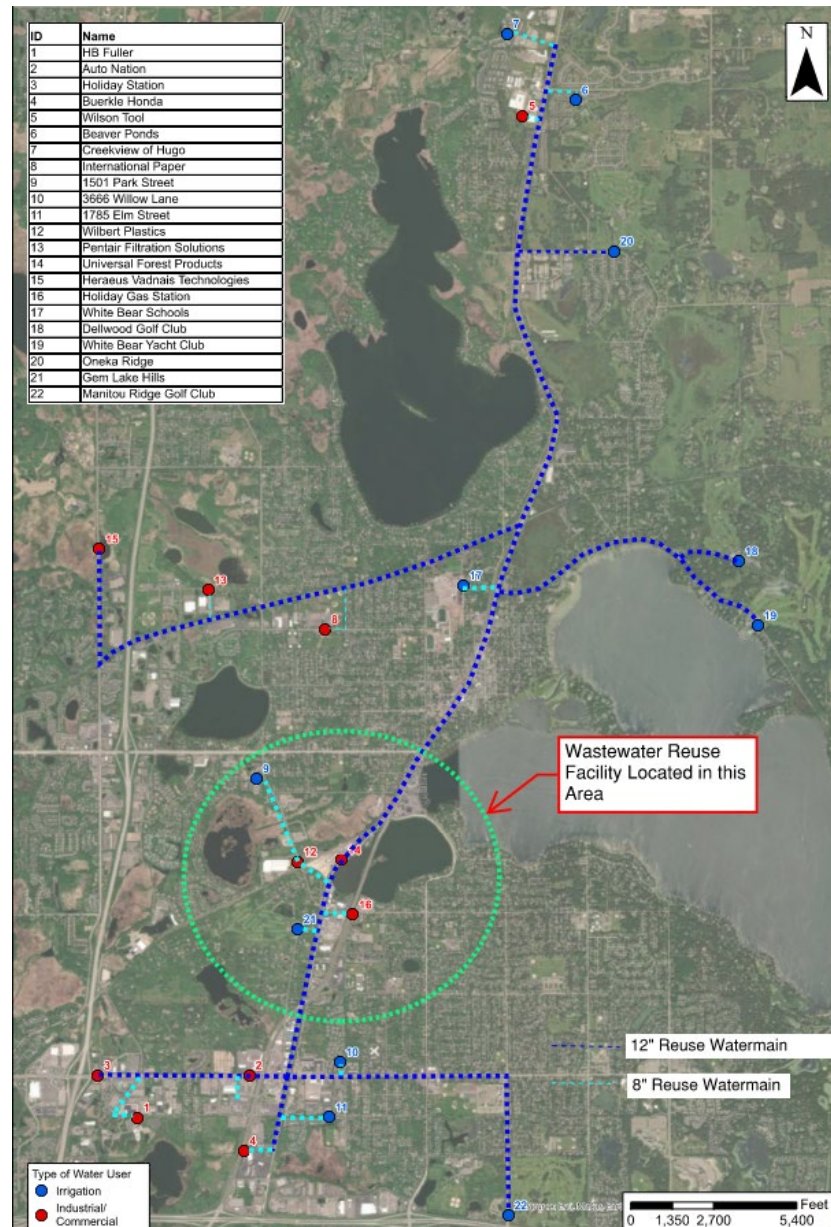
- MPCA – Guidance for Disinfected Tertiary Reuse Water
- Industrial process, cooling, irrigation, food crops
- Chloride
 - Irrigation
 - Cooling Towers
 - Chloride Goal < 50 mg/L

Chloride (ppm)	Effect on Crops
Below 70	Generally safe for all plants.
70-140	Sensitive plants show injury.
141-350	Moderately tolerant plants show injury.
Above 350	Can cause severe problems.

Wastewater Reuse Treatment Process



Wastewater Reuse System Layout



Wastewater Reuse – Capital Cost Opinion

Component	Unit	Est. Quantity	Unit Price	Cost
Effluent Diversion	LS	1	\$910,000	\$910,000
0.5 MG Equalization Tank	LS	1	\$2,500,000	\$2,500,000
2.5 MGD Wastewater Treatment Plant ¹	LS	1	\$75,000,000	\$75,000,000
2 MGD RO Reuse Treatment Plant	LS	1	\$18,000,000	\$18,000,000
1 MG Elevated Storage	LS	1	\$7,000,000	\$7,000,000
0.5 MG Reject Water Equalization	LS	1	\$2,500,000	\$2,500,000
12" Reuse Watermain	LF	91,000	\$500	\$45,500,000
8" Reuse Watermain	LF	14,000	\$450	\$8,550,000
Subtotal				\$159,960,000
40% Contingency				\$63,980,000
Subtotal Construction				\$223,940,000
Land Acquisition				\$5,000,000
15% Engineering				\$33,600,000
15% Construction Admin				\$33,600,000
Total:				\$296,000,000

Wastewater Reuse – O&M Cost Opinion

Item	Annual Cost
Labor (3 FTE)	\$450,000
Membrane Replacement	\$125,000
Chemicals	\$150,000
Electricity	\$225,000
Natural Gas	\$100,000
Equipment Repair	\$200,000
Lab Testing	\$50,000
Total Annual O&M	\$1,300,000

Wastewater Reuse Conclusions



- Reuse is expensive
- Collect wastewater samples

Questions?

