



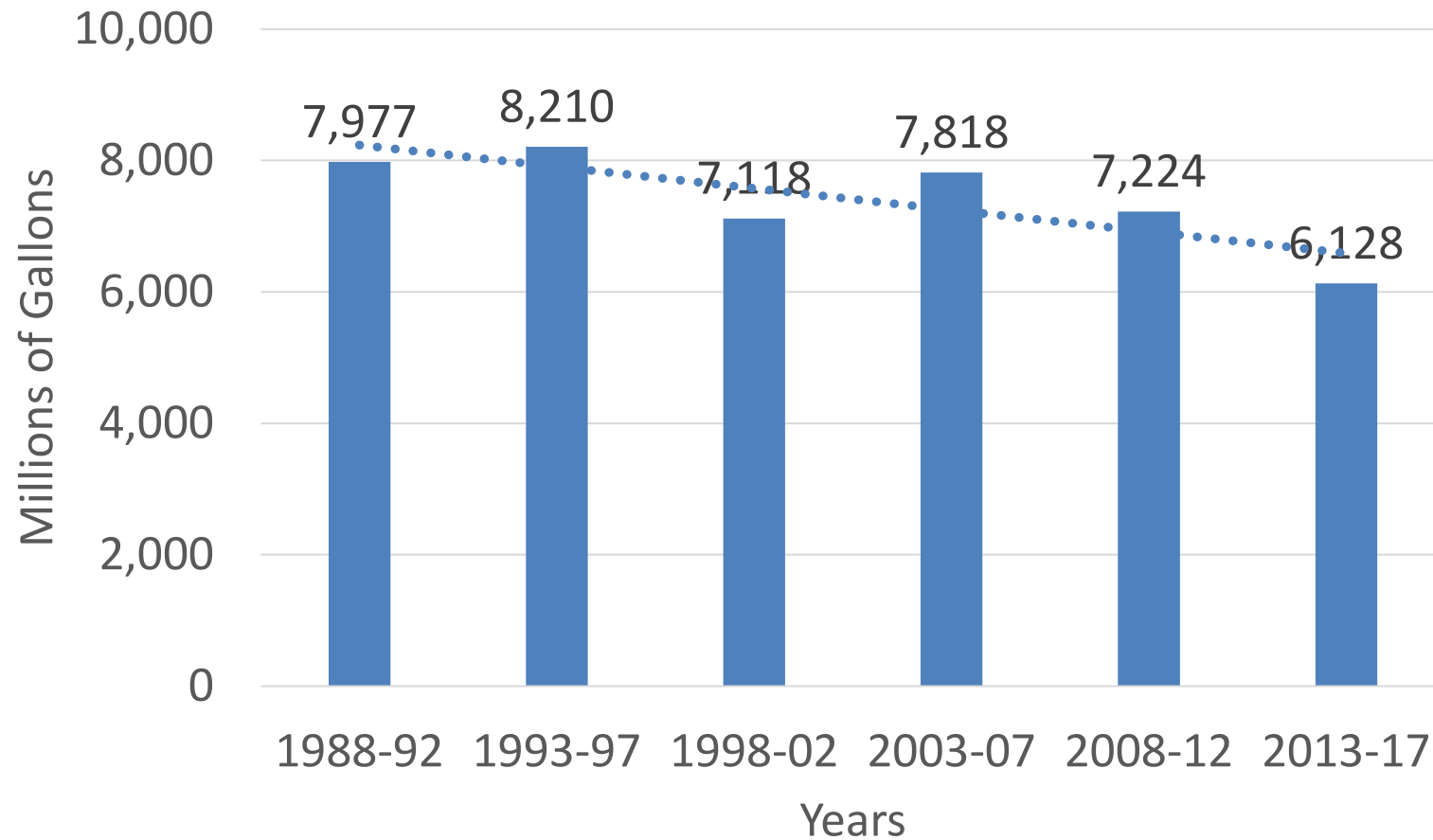
White Bear Lake Water Levels & Drinking Water Supply Planning

- Jason Moeckel – Section Manager, DNR Ecological and Water Resources

Key Elements of Court Order

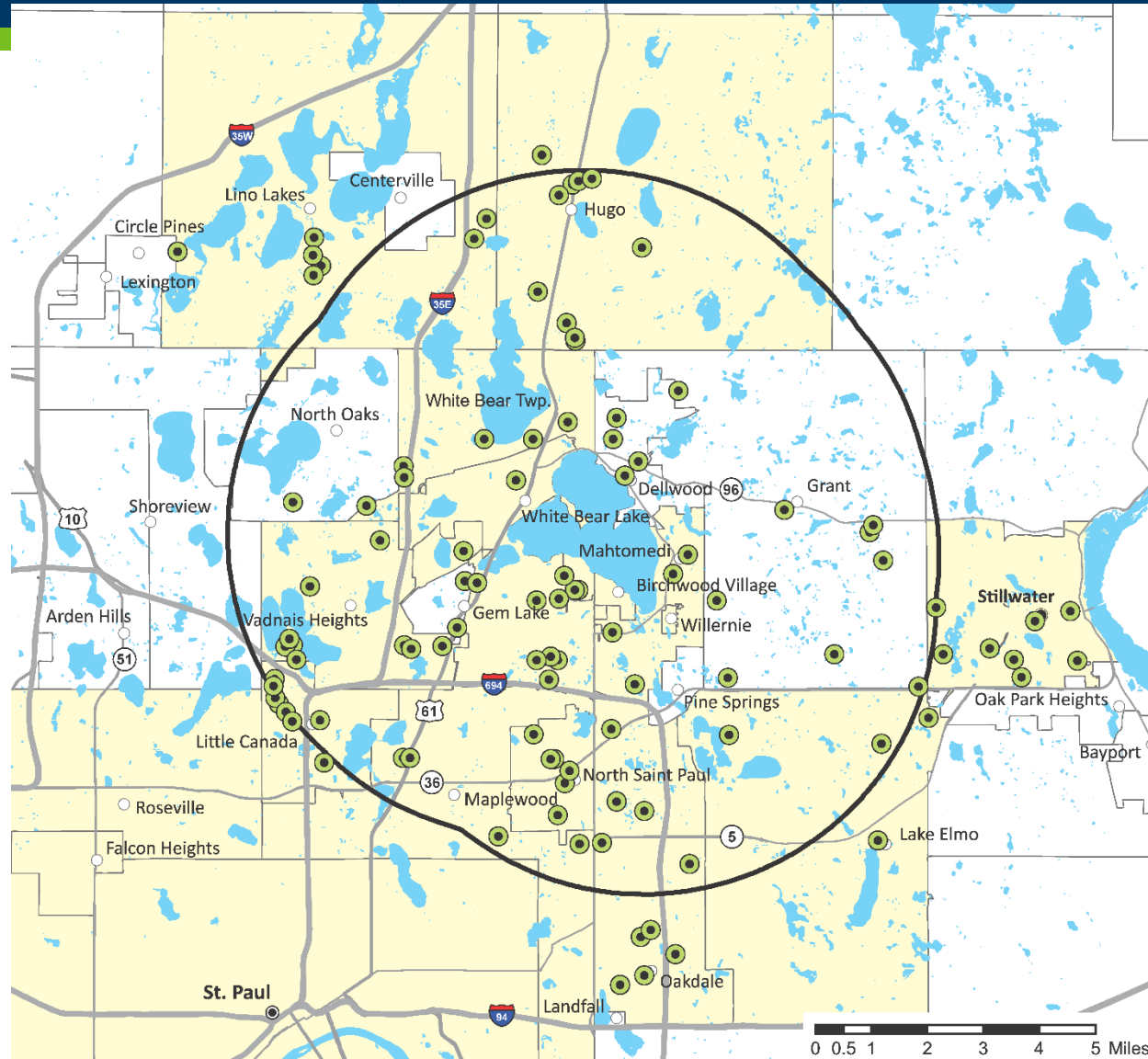
- DNR is prohibited from issuing new permits or increases within 5 miles unless certain conditions are met
- Residential irrigation ban at 923.5 lake elevation as trigger to the protective elevation
- Residential goal of 75 gpd per capita water use and total 90 gpd
- Requires public water suppliers to develop a contingency plan to shift their source of water from groundwater to surface water
- No groundwater permits can be issued unless the DNR has sufficient hydrologic data to understand the impact on White Bear Lake and the Prairie du Chien-Jordan aquifer
- DNR to set a collective annual withdrawal limit for White Bear Lake and adjust permits accordingly
 - Applies to all water use, including private wells

5 Yr Annual Avg Groundwater Use Within 5 Miles of WBL



Note: St. Paul Regional Water Services no longer relying on groundwater

Permits and Wells w/in 5 Mile Area



Collective Annual Withdrawal Limits

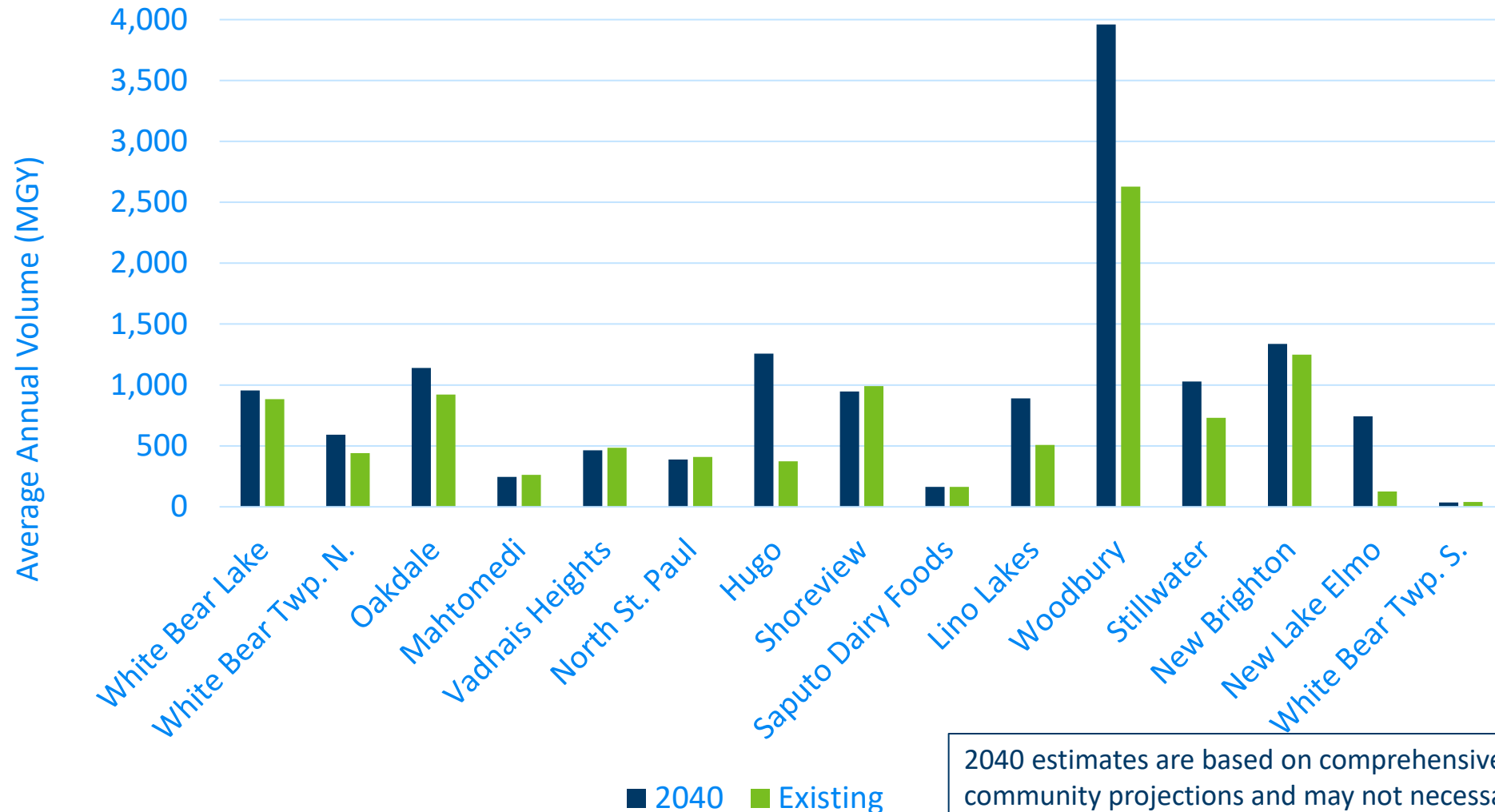


- M.S. 103G.285 limits 0.5 ac-ft/ac
- Protective Elevation - 0.4 ac-ft/acre 314 MGY
- Existing use – 0.745 ac-ft/acre comparable withdrawal – 585 MGY

Analysis to Ensure Domestic Supply

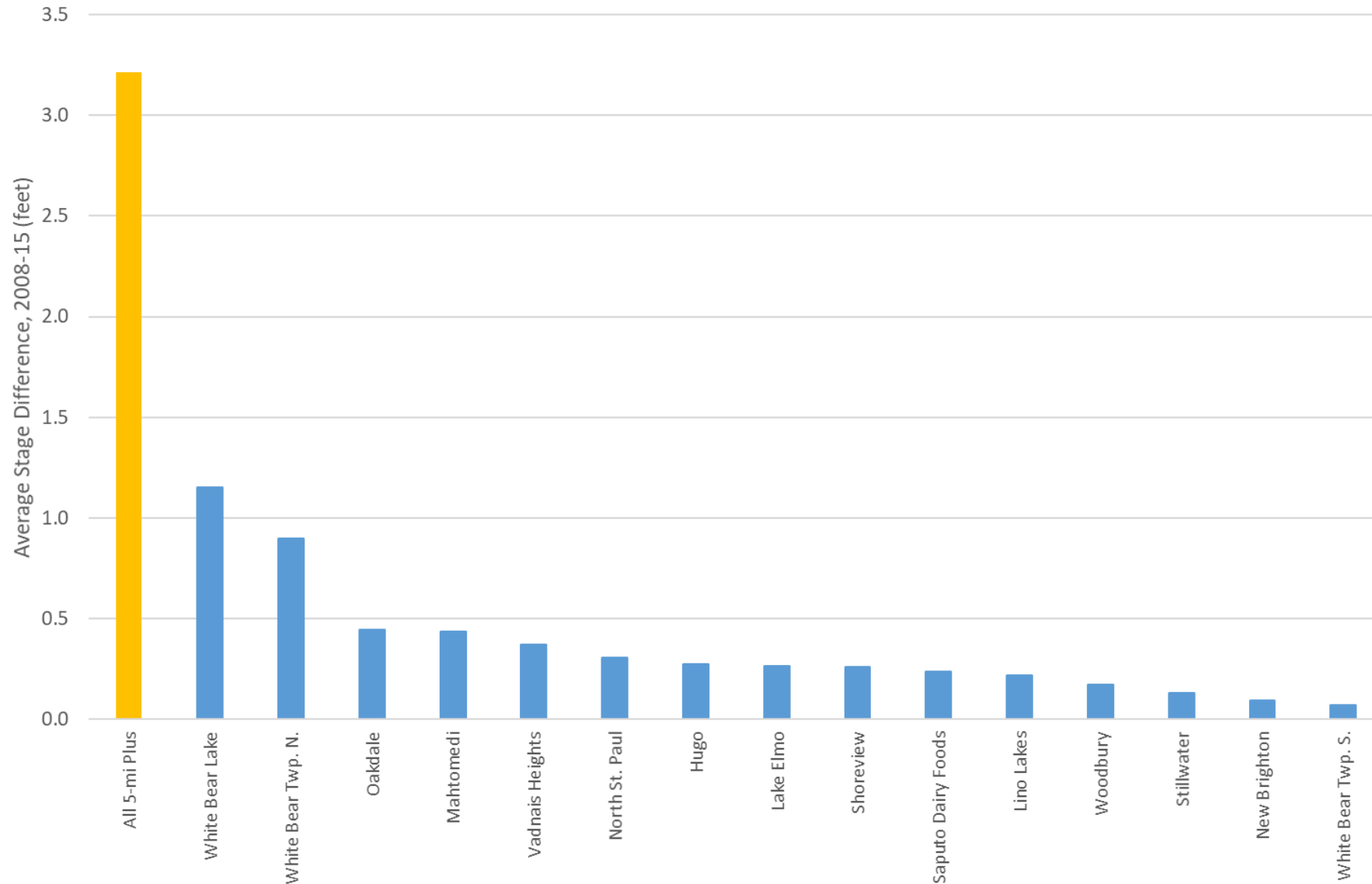
- Our modeling analysis indicates limiting total water use to the equivalent of about 55 gallons/day/capita (gpcd) would maintain lake levels near or above 922 feet under normal range of conditions.
- This is essentially limiting water for 1st priority uses, which does not include the use of water for schools; hospitals; medical offices; government buildings; commercial uses such as restaurants, gas stations, grocery stores, or any other store, hotels, or industrial uses.
- This analysis assumes 2020 population as the basis and pumping volumes from existing municipal water supply wells. $(\text{pop.}) \times (55) \times (365) = \text{allowable volume}$
- Any increases in domestic use or allowing lower priority water use would not maintain lake levels above 922 ft.

Average Annual Volume of Water Use – Existing and Projected for 2040



2040 estimates are based on comprehensive plans and community projections and may not necessarily reflect ongoing efforts at water conservation

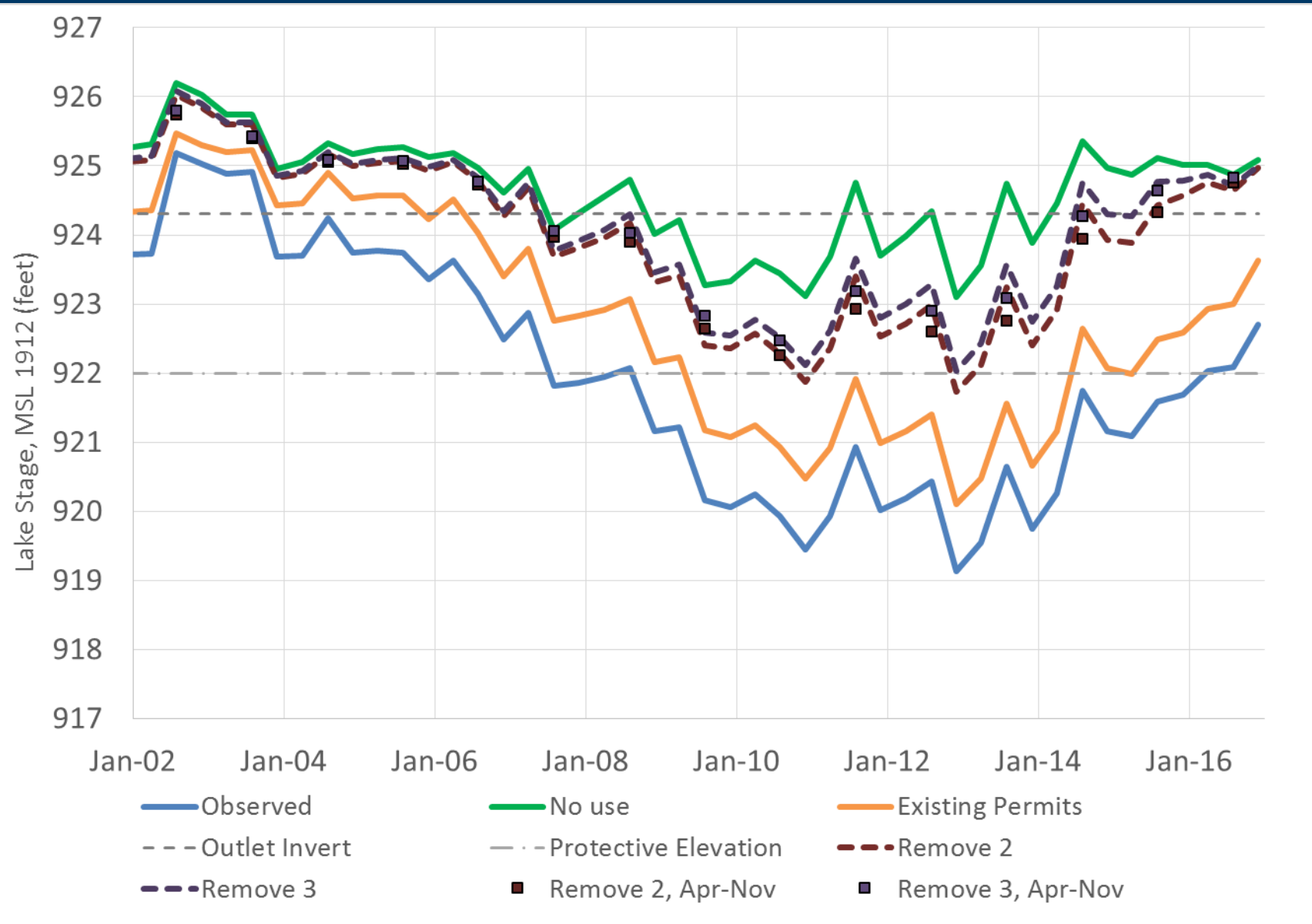
Relative Influence of Individual Permits on Lake Levels Under 2040 Water Use Projections - Top 15 Influencers



White Bear Lake – Projected Lake Levels Under Average 2040 Water Use in North and East Metro Area



White Bear Lake – Results of Using an Alternate Source of Water for Several Public Water Suppliers



2014 Feasibility Study on Northeast Metro water supply

Northeast Groundwater Management Area Meeting



June 2022

Ali Elhassan

metro council.org

2014 Findings

- Current SPRWS *excess* capacity: 30 MGD
- To bring water to the study area, a new water main from McCarrons Water Treatment Plant would be necessary.
- The six communities nearest to Saint Paul's system could be served without expanding major water treatment facility or raw water delivery system to the plant.
- Service beyond these six communities, would require additional large-scale infrastructure improvements.
 - Would significantly increase the capital costs

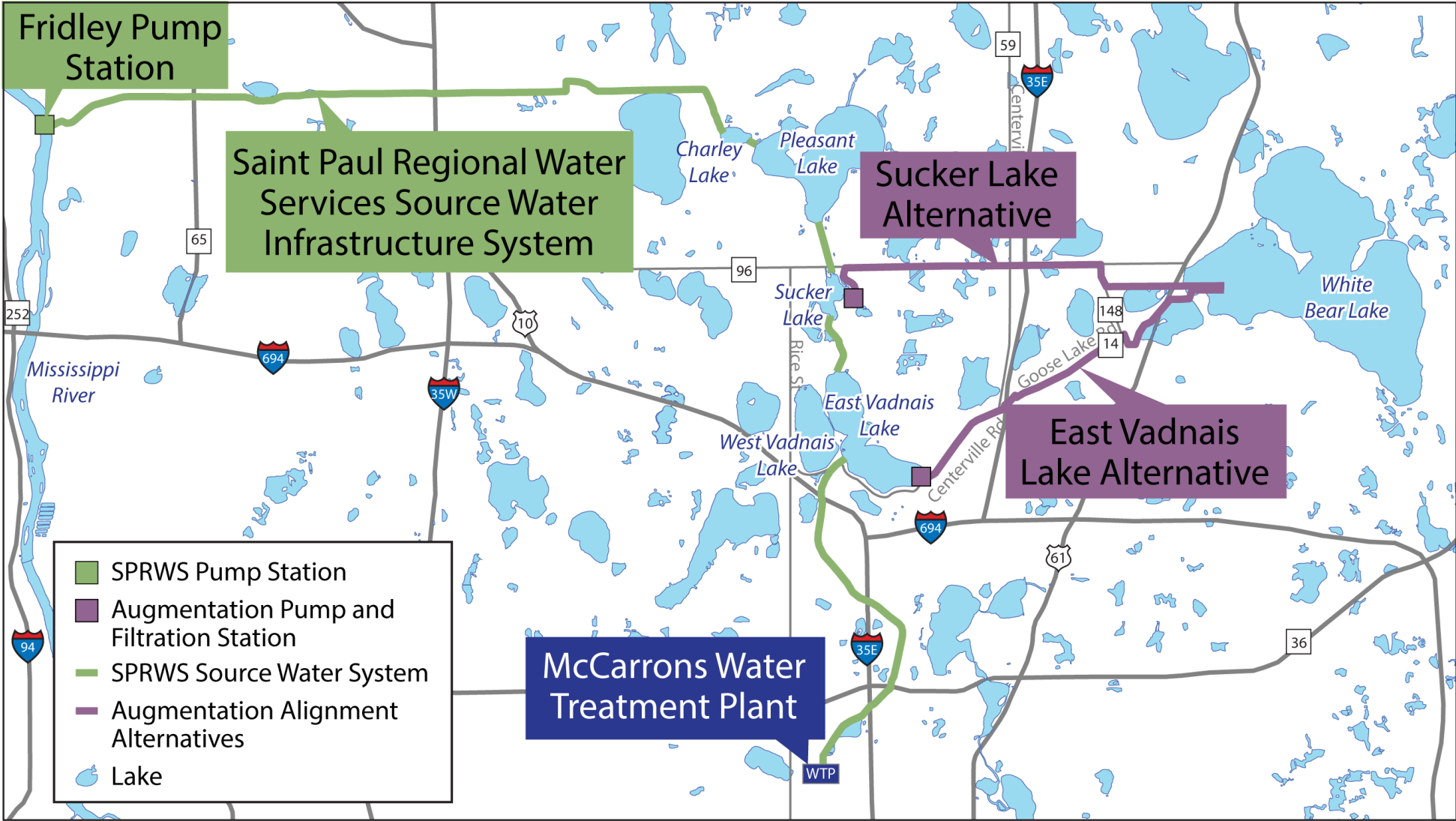
Summary of Costs (2014) – Water Supply Approaches

	Description	Capital Cost	Capital Cost (Per Person Served)
Alternative 1A	SPRWS - N St Paul	\$5,191,000	\$396
Alternative 1B	SPRWS - 6 Communities	\$155,363,000	\$1509
Alternative 1C	SPRWS - 13 Communities	\$623,178,000	\$2969
-	-	-	-
Alternative 2B	New Water Treatment Plant - 6 Communities	\$229,739,000	\$2231
Alternative 2C	New Water Treatment Plant - 13 Communities	\$609,701,000	\$2905

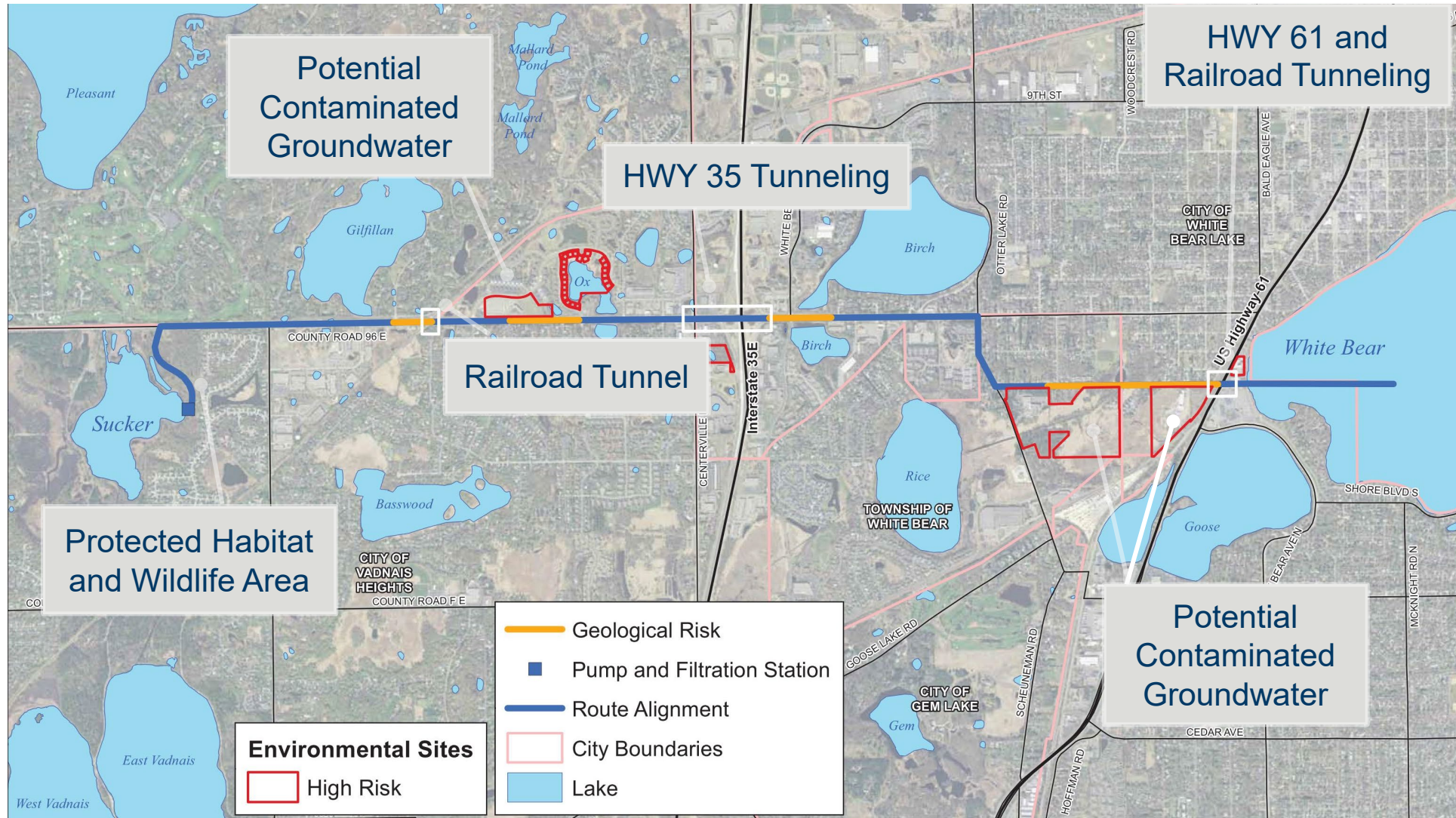
Review Augmentation Report January 2016

- Focused on two different alignment alternatives
- Identified items with highest impact on cost
- Identified unknown items that affect cost
- Define key assumptions
 - Flow rate = two (2) billion gallons per year
 - Treatment based on aquatic invasive species
- Developed costs using engineering best practices
 - Unit costs, equipment supplier quotes, past project bids
 - Peer review process to validate estimates

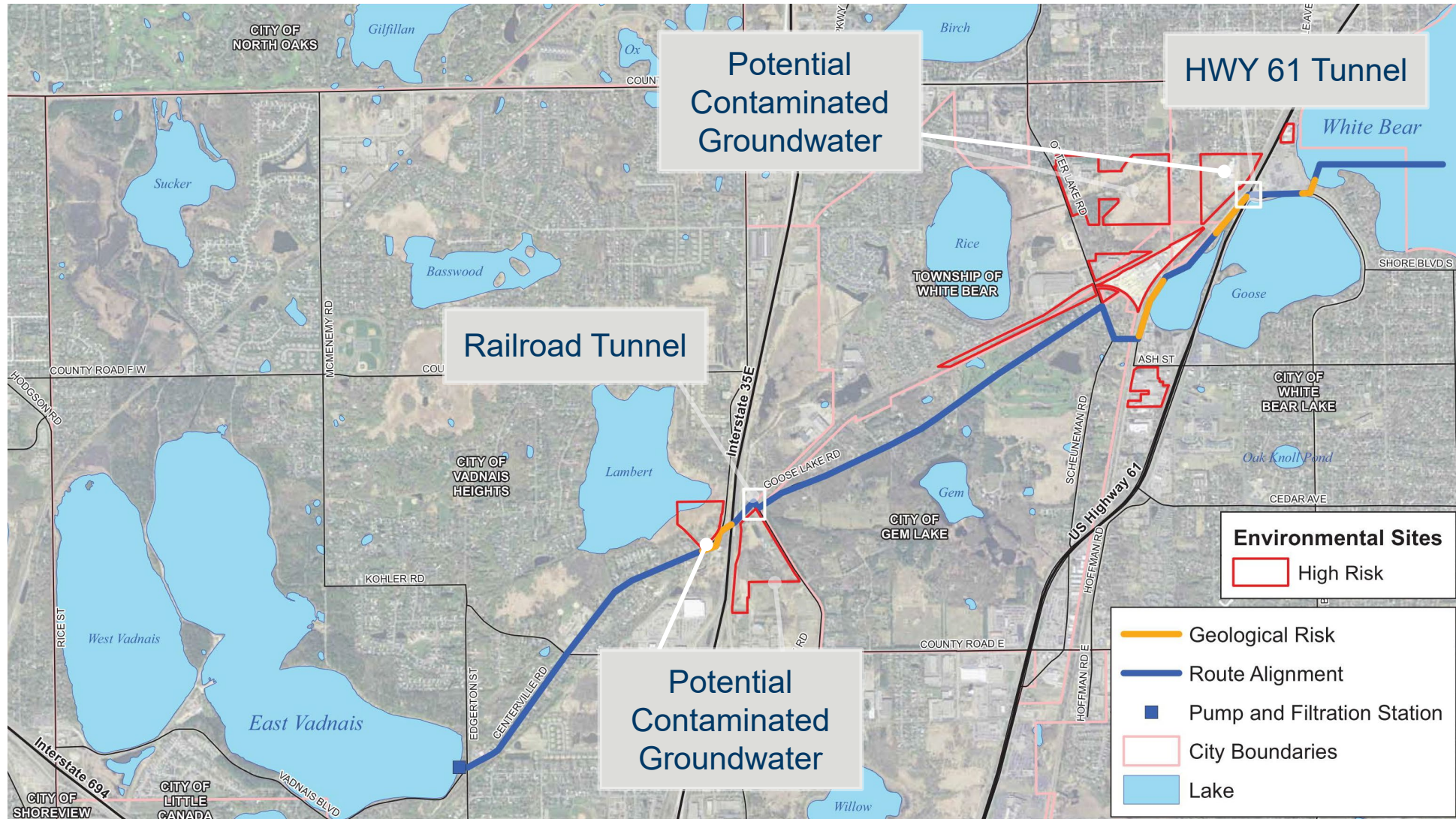
System Assumptions



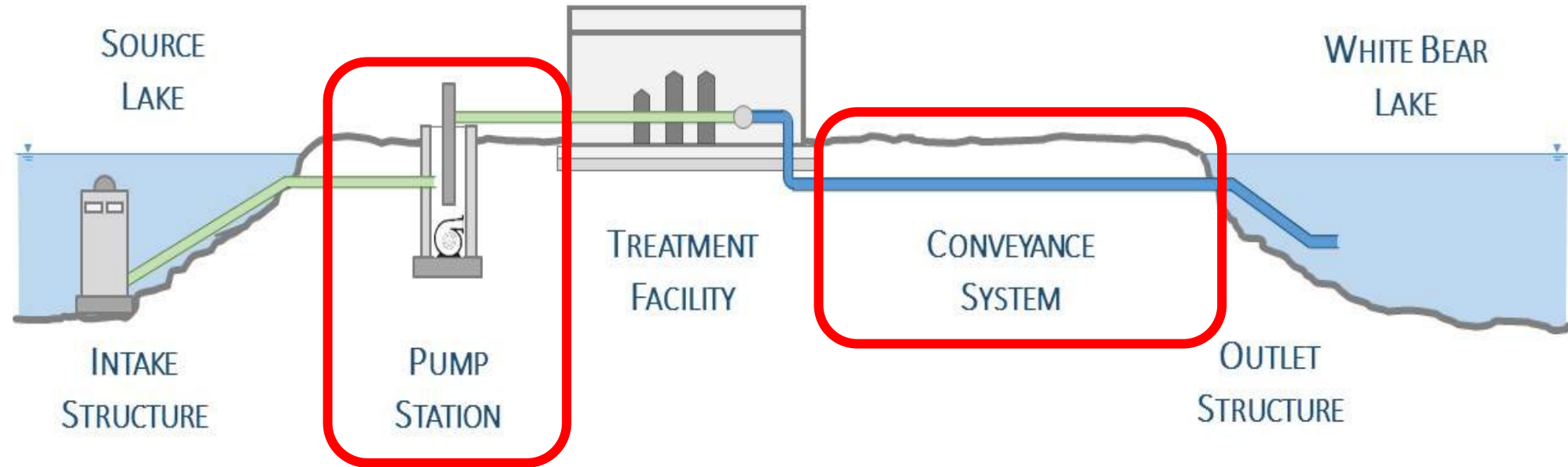
Sucker Lake Alternative



East Vadnais Lake Alternative



Cost Impacts - Conveyance



Limited review of subsurface conditions

Identified site specific feature cost impacts

Selected routes to avoid high risk features

Assigned higher than average costs for higher risk items

Capital Costs - \$ Millions

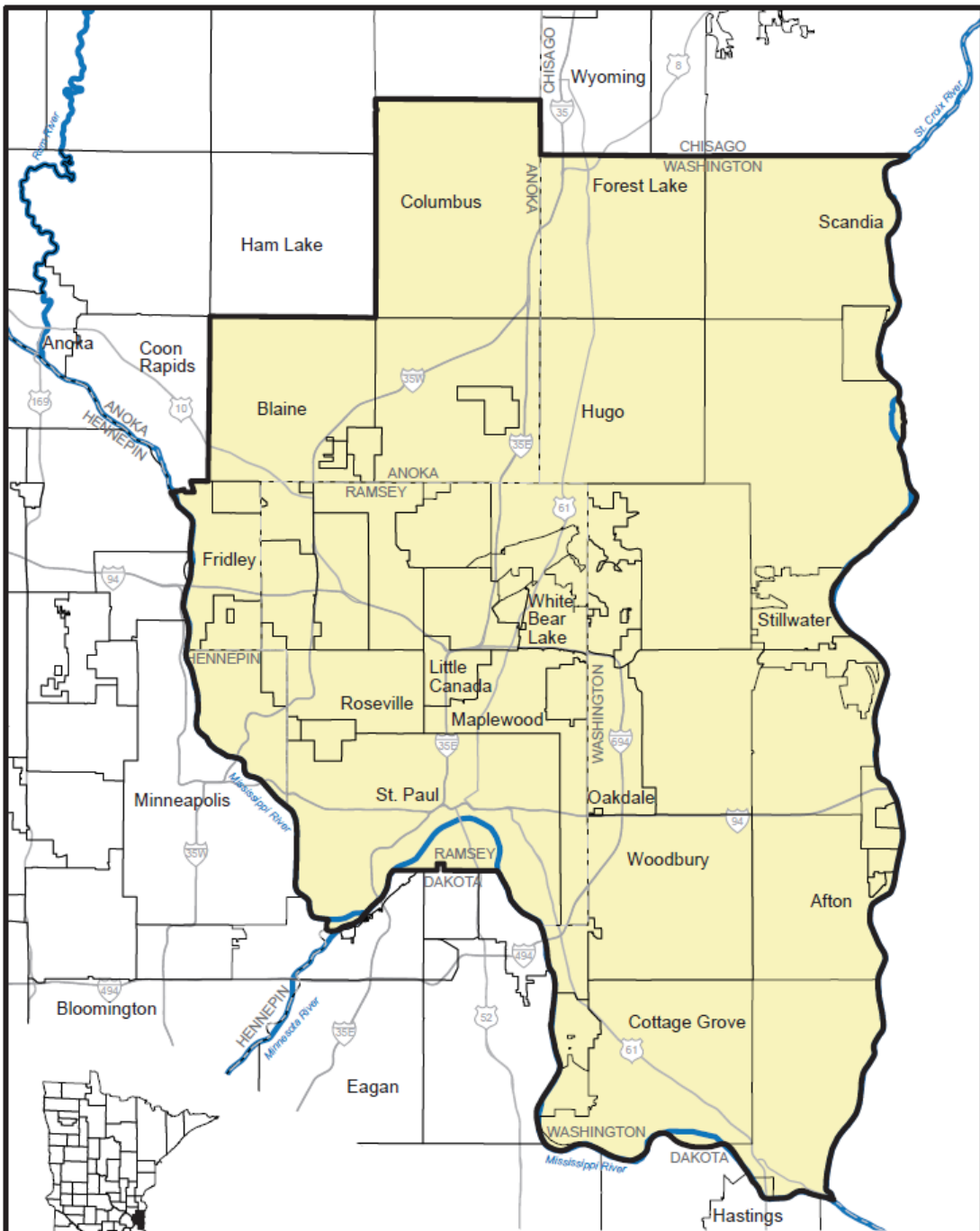
COST ITEM	SUCKER LAKE ALTERNATIVE	EAST VADNAIS LAKE ALTERNATIVE
Grading and Restoration	\$14.7	\$15.7
Filtration Facility	\$6.9	\$6.5
Pump and Pipe Work	\$8.0	\$7.8
Tunneling	\$9.6	\$1.1
Permits/Easements	\$2.0	\$2.7
Total Construction Cost	\$41.2	\$33.8
Contingency @ 20%	\$8.2	\$6.7
Total Construction Cost with Contingency	\$49.4	\$40.5
Engineering, Legal and Administrative @ 25%	\$12.4	\$10.1
Total Cost in 2015 Dollars	\$61.8	\$50.6
Total Cost at Mid-Point of Construction (2018-19)	\$67	\$55

Unknown Cost Impacts

- Level of water quality treatment required
- Amount of water pumped each year
- Regulatory decisions
- Different alignments
- Unknown subsurface conditions

Annual (Operations & Maintenance) Costs - \$ Millions Per Year

ITEM	\$ MILLIONS PER YEAR
Filtration System	\$0.11
Pumping	\$0.17
Pipeline	\$0.07
Water Purchase	\$0.22
TOTAL	\$0.57



North and East Metro Groundwater Management Area