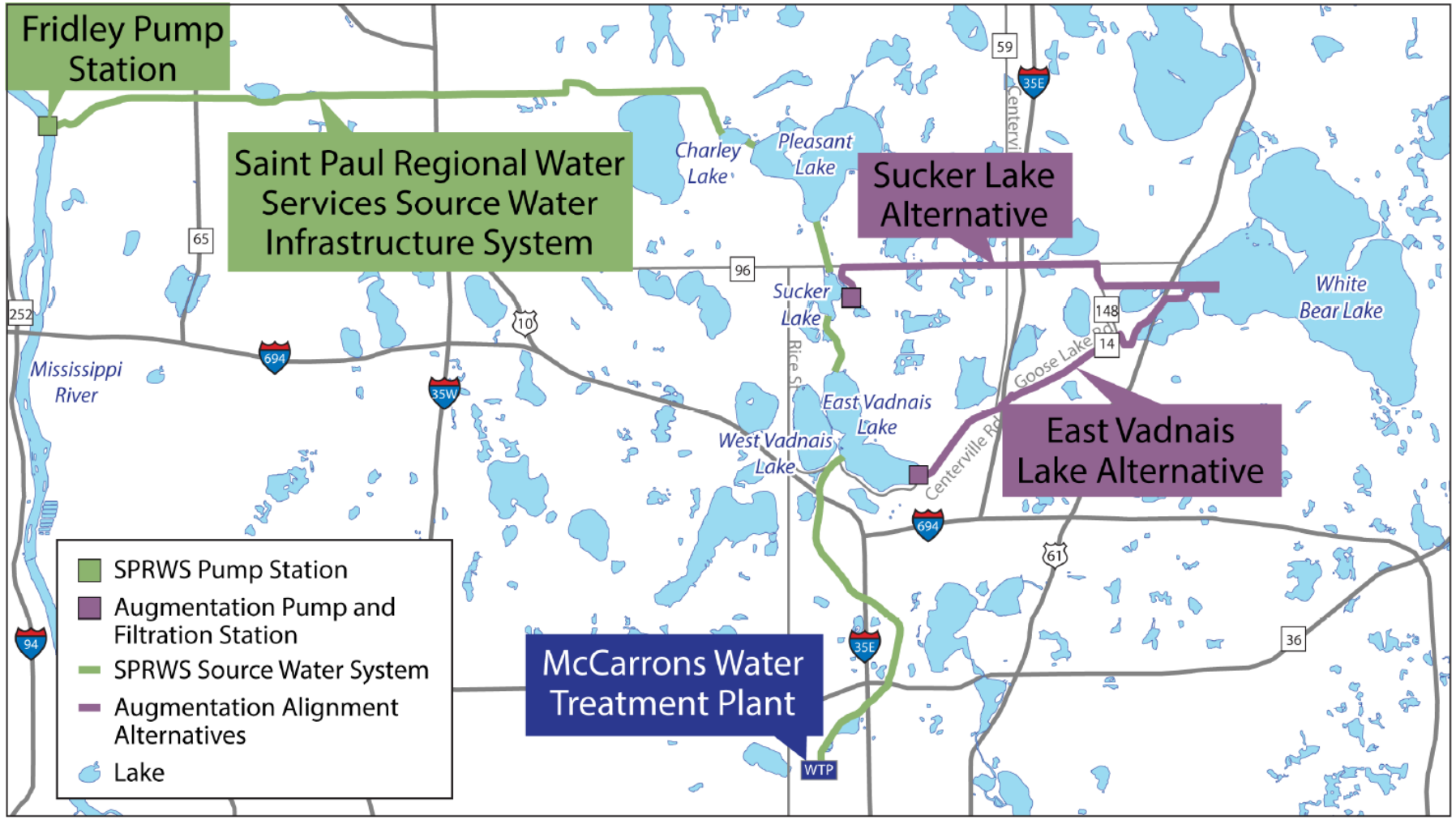
Study 7A – Phase 3 Scope of Work Discussion (1 of 11)

Chain of Lakes System



Study 7A - Phase 3 Scope of Work Discussion (2 of 11)

Study 7A – Surface water quality study for White Bear Lake augmentation or surface water treatment for drinking water

Purpose of Study 7A

- Develop a calibrated surface water model to simulate flow patterns, water levels, and water quality in the Mississippi River, chain of lakes, and White Bear Lake
- Model the watersheds around the chain of lakes and determine pollutant loads from surface water/stormwater runoff
- Assess existing and future water quality conditions and goals under various scenarios

Study 7A – Phase 3 Scope of Work Discussion (3 of 11)

Study 7A – Surface water quality study for White Bear Lake augmentation or surface water treatment for drinking water

Purpose of Study (continued)

- Provide decision support for water resource management strategies related to lake treatment and augmentation
- Generate detailed documentation for model development and application
- Conduct a sensitivity analysis with a higher range of detected contaminants to predict the magnitude of impacts on the water bodies

Study 7A – Phase 3 Scope of Work Discussion (4 of 11)

Study 7A – Surface water quality study for White Bear Lake augmentation or surface water treatment for drinking water

Purpose of Study (continued)

- Conduct a risk assessment for toxics, pesticides, organics, and other toxic substances that could cause significant concentrations in East Vadnais Lake or White Bear Lake
- Provide a mitigation plan and determine level and type of surface water treatment required for either lake augmentation or a regional surface water treatment plant for drinking water

Study 7A – Phase 3 Scope of Work Discussion (5 of 11)

Study 7A – Surface water quality study for White Bear Lake augmentation or surface water treatment for drinking water

Purpose of Study (continued)

- Determine additional feed rates for dissolved oxygen and ferric chloride needed from current conditions in St. Paul Regional Water Services' hypolimnetic feed systems in Pleasant and Vadnais Lakes to maintain water quality

Requires an advanced surface water quality model and analysis

Study 7A – Phase 3 Scope of Work Discussion (6 of 11)

2015-2016 lake augmentation study gaps

- Insufficient total phosphorus data to estimate potential changes to trophic level and water transparency in White Bear Lake with augmentation from Sucker or East Vadnais lake
- Insufficient data to assess potential threats to human and aquatic life from White Bear Lake augmentation
- Insufficient data to prepare necessary permits and meet regulatory requirements
- Insufficient data to identify, size, and estimate cost of treatment of augmentation water. Main focus was on treating phosphorus, zebra mussels, and suspended solids.

Study 7A – Phase 3 Scope of Work Discussion (7 of 11)

Current study gaps identified and being addressed

- Analysis of primary and secondary drinking water contaminants, including PFAS and emerging contaminants, in the Mississippi River and the chain of lakes
- Surface water/stormwater runoff contaminants from the watersheds that surround the chain of lakes
- Updated groundwater modeling and well pumping rates that account for future water demands through ultimate development in the White Bear Lake area

Study 7A – Phase 3 Scope of Work Discussion (8 of 11)

Three phases of Study 7A

- **Phase 1** – Data inventory, establish water quality goals, update current monitoring plans for SPRWS, VLAWMO, and Ramsey County Public Works,
- **Phase 2** – Laboratory analysis and data management
- **Phase 3** – Surface water quality modeling and analysis, project management, data collection, and review

Study 7A – Phase 3 Scope of Work Discussion (9 of 11)

Following Study 7B

- Study 7A results will be used for Study 7B to determine the infrastructure requirements and estimated costs for either lake augmentation or a regional surface water treatment plant for drinking water

- SPRWS will use the modeling results to assess the capacity of the existing hypolimnetic feed systems in Pleasant and Vadnais Lakes

Study 7A – Phase 3 Scope of Work Discussion (10 of 11)

Phase	Phase Name	Description	Estimated Fees	% of Budget
Phase 1	Study 7A-1	Data Inventory, Goals, Monitoring Plan/Costs, Scope Revisions	$66,763	9%
Phase 2	Study 7A-2	Laboratory Analysis and Data Management	$162,440	23%
Phase 3	Study 7A-3	Management, Data Collection, & Review	$90,985	13%
		Projected Community Water Demands Review	$7,740	1%
		Water Quality Goals	$32,790	5%
		Watershed Modeling	$46,565	7%
		Surface Water Quality Modeling and Analysis	$204,750	29%
		Risk Assessment	$29,080	4%
		Mitigation Plan	$8,320	1%
		Reporting	$53,680	8%
		Public Outreach	$8,050	1%
		Total Phase 3	**$481,960**	**67%**
Project Total			***$711,163***	***100%***
Project Total without Laboratory Fees			***$573,163***	

Study 7A – Phase 3 Scope of Work Discussion (11 of 11)

Questions?