White Bear Lake Area Comprehensive Plan Study 1

Redirect Stormwater to Augment White Bear Lake (Initial Evaluation)

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METROPOLITAN COUNCIL

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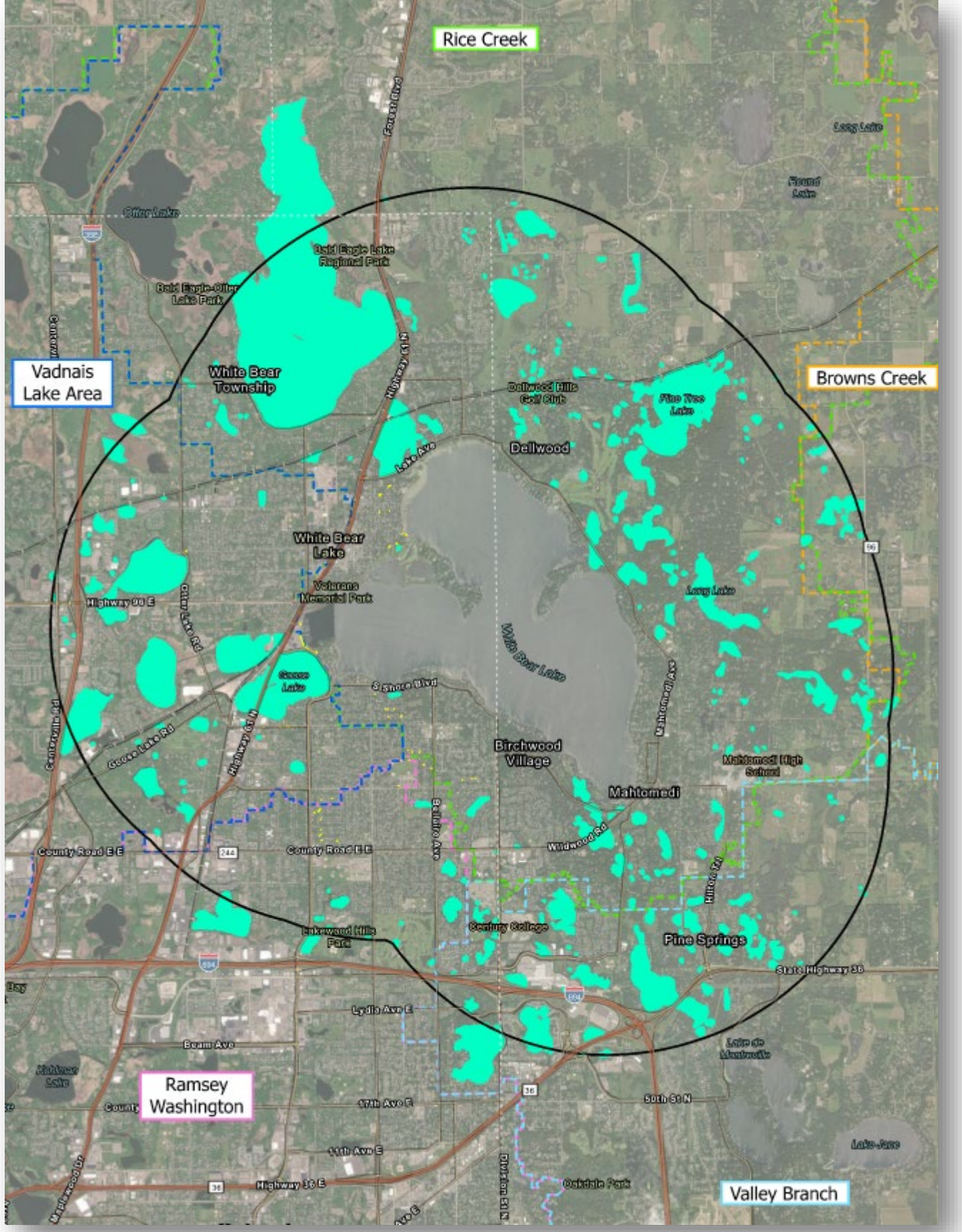
Scope of Study

- Review and estimate number of existing stormwater ponds within 2 miles of White Bear Lake
- Identify potential challenges, issues, concerns with redirecting stormwater to the lake

Existing Stormwater Ponds

- MnDNR Hydrography Dataset
- Reviewed storm GIS data from two cities and one watershed
- Established 2-mile boundary
- Filtered out named lakes, wetlands, public waters
- Recognize that filtered data still includes some non-storm ponds
- 188 ponds/water features identified



MnDNR Hydrography Dataset

Legend

- 2-mile Boundary
- DNR Water Bodies
- Raingarden

Watershed Districts

- Browns Creek
- Ramsey-Washington
- Rice Creek
- Vadnais Lake Area
- Valley Branch

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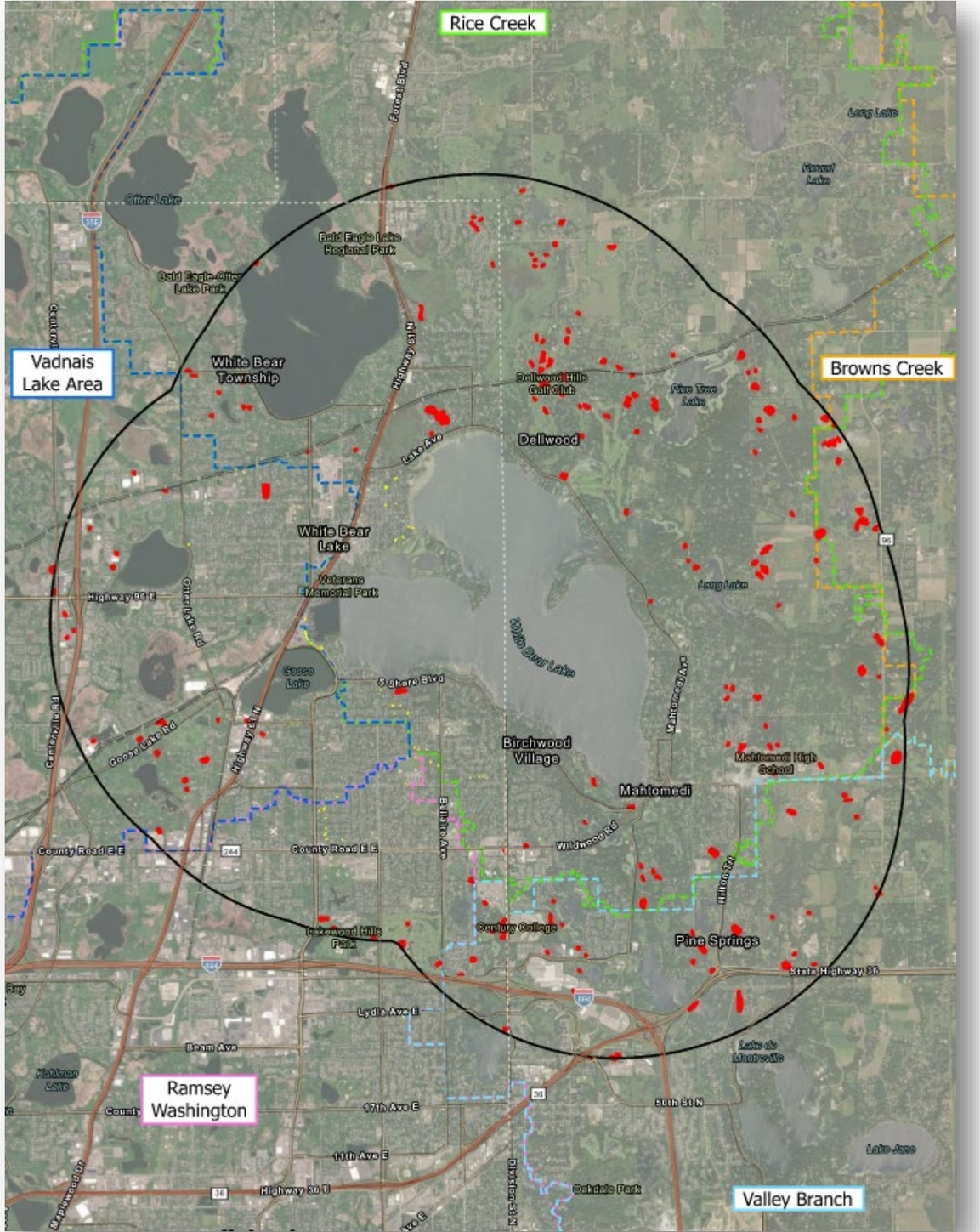

Filtered Dataset

Legend

- 2-mile Boundary
- Reduced DNR Water Bodies
- Raingarden

Watershed Districts

- Browns Creek
- Ramsey-Washington
- Rice Creek
- Vadnais Lake Area
- Valley Branch

Pond Volume Calculations

Volume Assumptions:

- 4 feet of available storage depth, 4:1 side slopes

Watershed	Number of Ponds	Total Pond Area (AC)	Estimated Volume (MG)
Browns Creek	10	13.2	15
Ramsey-Washington	10	4.8	5
Rice Creek	108	62.7	67
Vadnais Lake Area	22	12.1	13
Valley Branch	38	25.5	28
Total	**188**	**118**	**128**

Challenges, Issues, and Concerns

Pumping and Routing / Distribution

- Complex network of pumps, force main
- Permitting issues:
  - Goal for no new discharge locations to White Bear Lake
  - Moving water across watershed boundaries
- Easements may be available for pumps, less so for force mains
- Power source for pumps
- SCADA system for monitoring and controlling multiple pump stations
- Ownership, maintenance, operational responsibilities

Stormwater Contaminants

Pollutant	Sources	Potential Concerns	Mitigation Strategies
Nutrients (N, P)	Sediment, organic debris, fertilizer, animal feces, combined sewer overflows	Algae growth, microbial growth	Anoxic zone for denitrification
Organic Matter	Organic debris (leaves, twigs, etc.)	Decomposition causing low dissolved oxygen and odors	Infiltration
Suspended Sediment	Paved surfaces, bare soil, construction, stockpiles	Clogging intake/distribution, increased maintenance	Infiltration
Chlorides	De-icing and water softening chemicals	Corrosive to pipes, toxic to plants and fish. High GW risk.	No cost-effective treatment
Pathogens	Animal feces, insects, sewage overflows, waste management drainage	Risk to human health	Increase temperature, low soil Ph, finer clay soils
Metals	Vehicle exhaust, roofing materials, vehicle repair drainage	Toxic to plants and fish.	Infiltration
Organic Chemicals (pesticides, industrial chemicals, petroleum chemicals)	Drainage of sources of organics	Human/animal health risk, toxic to plants and fish.	Microbial degradation

Dry Weather Considerations

- Aesthetics
- Unwanted vegetation growth from extended drawdown
- Odor concerns with decaying organic matter

Property Value Considerations

- Previous EPA study (1992)
  - Ponds can be great benefits when appearing natural and maintained
  - If poorly maintained, can be mosquito breeding grounds
- Local studies in Maryland and Colorado
  - Property adjacent to stormwater ponds sell at a premium
  - Up to 30% higher neighboring properties not adjacent to ponds
- Pumping from existing ponds may decrease property values in areas adjacent to existing ponds. Would require further review to quantify.

Study 1 (Initial Evaluation) Conclusions

- Could be up to 100 million gallons available annually
- Complex network of pumps, force mains and operational control systems
- Regulatory challenges to move water across watershed boundaries
- Potential impacts to property values
- Further review and discussion of operation and maintenance requirements and responsibilities

Questions