

Water Supply Work Plan for Clean Water Fund Activities

Environment Committee

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Water Supply Planning

The Metropolitan Council analyzes water supply issues in the context of regional growth, supporting wise management decisions that protect Minnesota's most-used drinking water sources.

Our activities are guided by the Twin Cities Metropolitan Area Master Water Supply Plan.



Water Supply Plan Funding

- Initial \$2 million from an unused solid waste planning bond
- Clean Water, Land, and Legacy Amendment Clean Water Fund appropriations:
 - \$400,000 in FY 10
 - \$400,000 in FY 11
 - \$1,000,000 in FY 12-13 (\$500,000 per year)



Clean Water Fund Projects

- Thirteen projects
 - Four complete
 - Four in progress
 - Five being developed
- \$552,900 spent
- \$1,247,100 remains





Project Work Plan

	2010	2011	2012	2013	2014
East Bethel Water Availability	-----				
Water Conservation Cost/Benefit	-----				
Groundwater/Surface Water	-----				
Aquifer Property Mapping	-----				
Stormwater Reuse Guidance		-----			
Glacial Aquifer Vulnerability		-----			
Seminary Fen		-----	-----	-----	
South Washington County		-----	-----	-----	
Rural Source Water Protection			-----	-----	
Recharge Model			-----	-----	
Groundwater Model			-----	-----	-----
Industrial Water Use Efficiency			-----	-----	-----
Stormwater Infiltration BMPs			-----	-----	-----

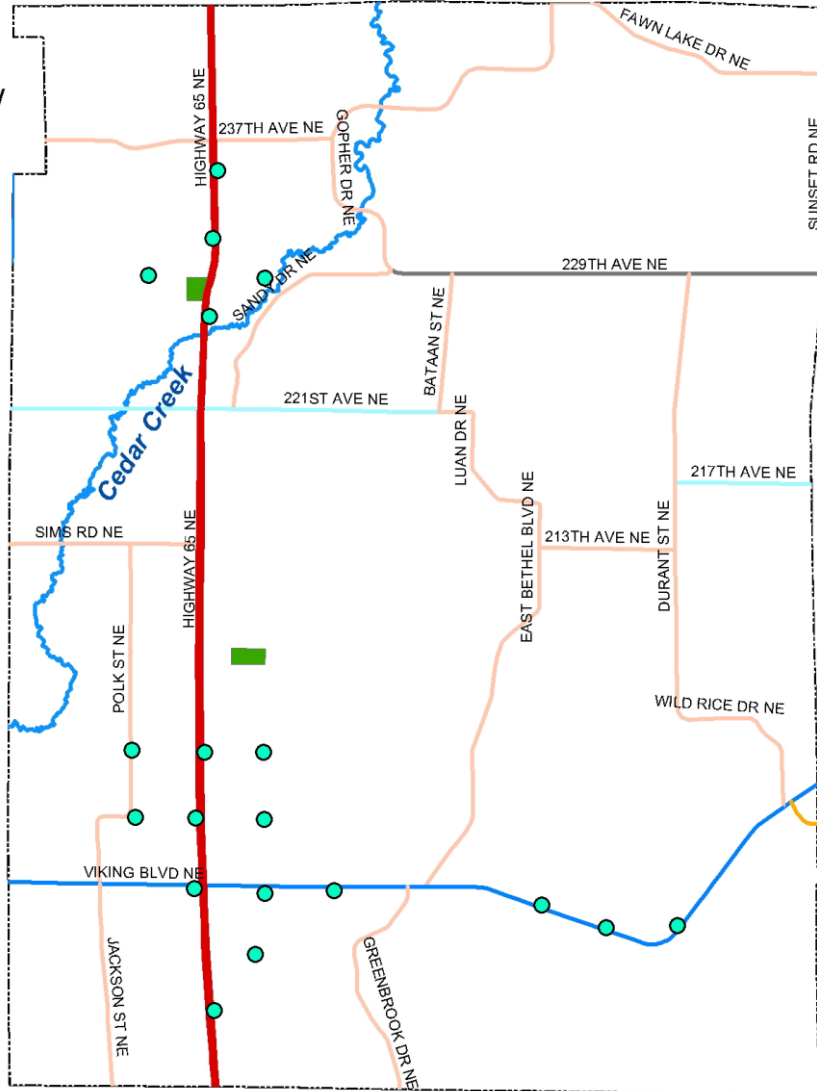





Assessment of East Bethel Water Availability

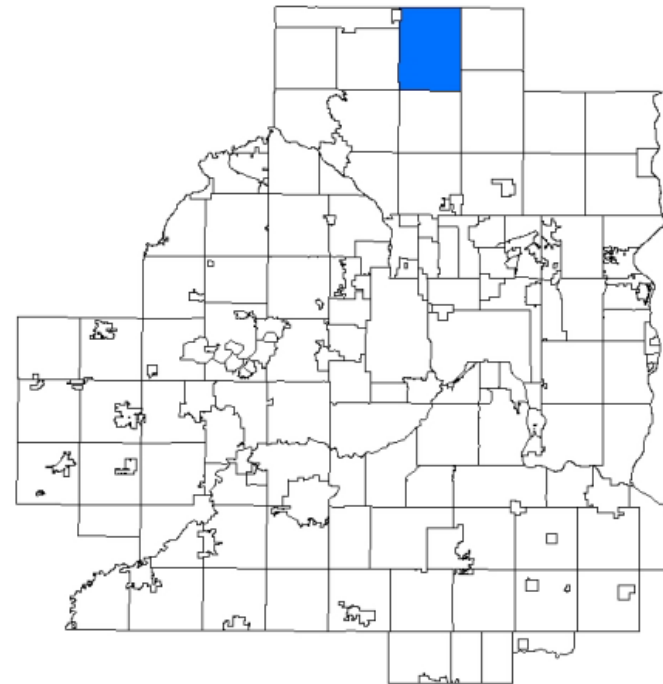
- \$110,200
- Complete
- Partnered with Braun Intertec and East Bethel
- Benefits: water supply planning and sewer service expansion were aligned



Assessment of East Bethel Water Availability



-  Approximate Location of Future Well
-  Infiltration Gallery
-  Cedar Creek





Cost Benefit Analysis of Water Conservation

- \$77,000
- Complete
- Partnered with Environmental Financial Group
- Benefits: increased capacity to avoid or delay infrastructure expansion costs by reducing per capita water demand



Cost Benefit Analysis of Water Conservation

Measures

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Included Measure / Program Element	Unit	Average Annual Water Savings	Unit Peak Annual Water Savings	Target Water Demand	Target Water Demand	Target Customer Class	Potential Accounts	Market Penetration Rate	Installation Rate	Total Annual Average Water Savings
x 1.6 gal Toilet Replacement	48	-	-	good	leak	Average Residential	30,400	80%	30%	0.7
Building interior retrofit	88	-	-	good	leak	Average Residential	30,400	80%	30%	not incl
Commercial landscape	25	100,000	good	Outside	Peak	Comml	5,000	100%	100%	0.3
Commercial water audits and retrofits	700	700,000	good	Outside	Peak	Comml	5,000	100%	100%	0.6

Annual Operating Costs

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Item	Annual Cost, \$	Percent Fixed	Percent Variable	Fixed	Variable
Labor					
Direct Labor Costs	1,000,000	100%	0%	1,000,000	-
Benefits	150,000	100%	0%	150,000	-
Other	25,000	100%	0%	25,000	-
Chemicals					
Chlorine	350,000	0%	100%	-	350,000
Other	250,000	0%	100%	-	250,000
Other	50,000	0%	100%	-	50,000
Utilities and Fuels					
Electricity	425,000	17%	83%	72,250	352,750
Natural Gas	115,000	100%	0%	115,000	-
Diesel	25,000	0%	100%	-	25,000
Fuel Oil	5,000	0%	100%	-	5,000

Costs and Benefits

Baseline Account Water, MGal 2,037.0
 Account Water with Conservation, MGal 1,437.6
 Savings, MGal 599.4

Upfront Conservation Measures Costs \$ 5,563,600
 Ongoing Conservation Measures Costs \$ 500
 Annualized Conservation Measures Costs \$ 446,938

Annual Savings \$ 306,583

Benefit / Cost 0.69

WATER USE PROFILE

Test Year Water Accounting

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	Amount	
	MGal per Year	
Total Water Produced [1]	3,000	
Account Water [2]	2,450	81.7%
Nonaccount Water [3]	550	18.3%
Metered and Accounted for, but Not Billed [4]	100	3.3%
Unmetered Water [5]	450	
Authorized Uses [6]	50	1.7%
Unauthorized Uses	400	
Identifiable Unauthorized Uses [7]	50	1.7%
Unaccounted for Water [8]	350	11.7%
	100.0%	100.0%

- MGal = Millions of Gallons
- Adjusted for source-meter accuracy and source and transmissions losses
 - Water metered and billed to residential, commercial and industrial and public sector customers
 - Metered and unmetered uses and losses not billed to account customers
 - Selected public-use water, other water metered but not billed, and losses associated with metered accounts
 - Not metered or billed
 - Operations and maintenance, other selected public-use water
 - Account errors, malfunctioning controls, illegal connections and theft, avoidable and unavoidable leaks
 - Water losses and leaks not accounted for

Discount and bond rate 5.0%
 Loan Term 20
 Inflation Rate 4.0%

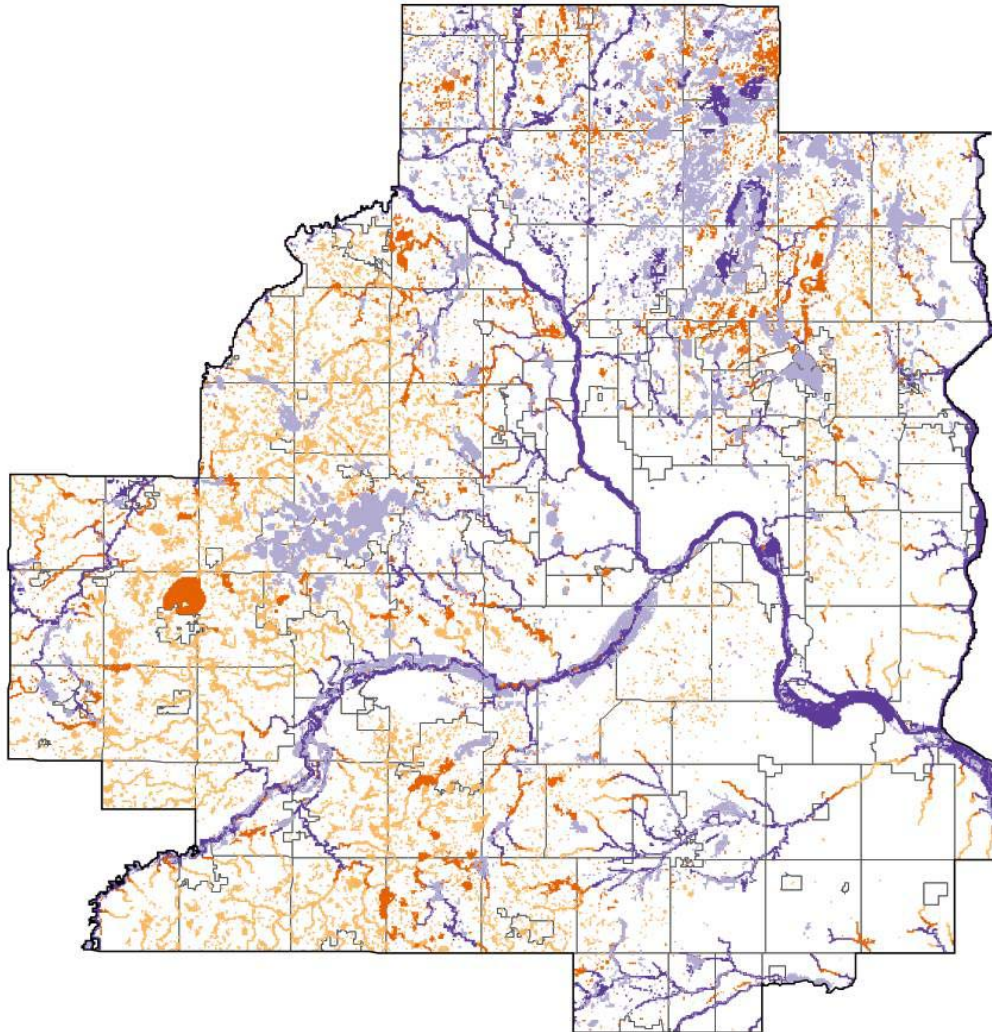


Evaluation of Groundwater & Surface Water Interaction

- \$101,000
- Complete
- Partnered with Barr Engineering
- Benefits: monitoring and management activities are better targeted to protect vulnerable lakes, wetlands, and streams



Evaluation of Groundwater & Surface Water Interaction



Over 100,000 surface waters analyzed:

52% are disconnected from the regional groundwater system

30% recharge aquifers

16% receive and discharge groundwater

2% are supported by upwelling groundwater



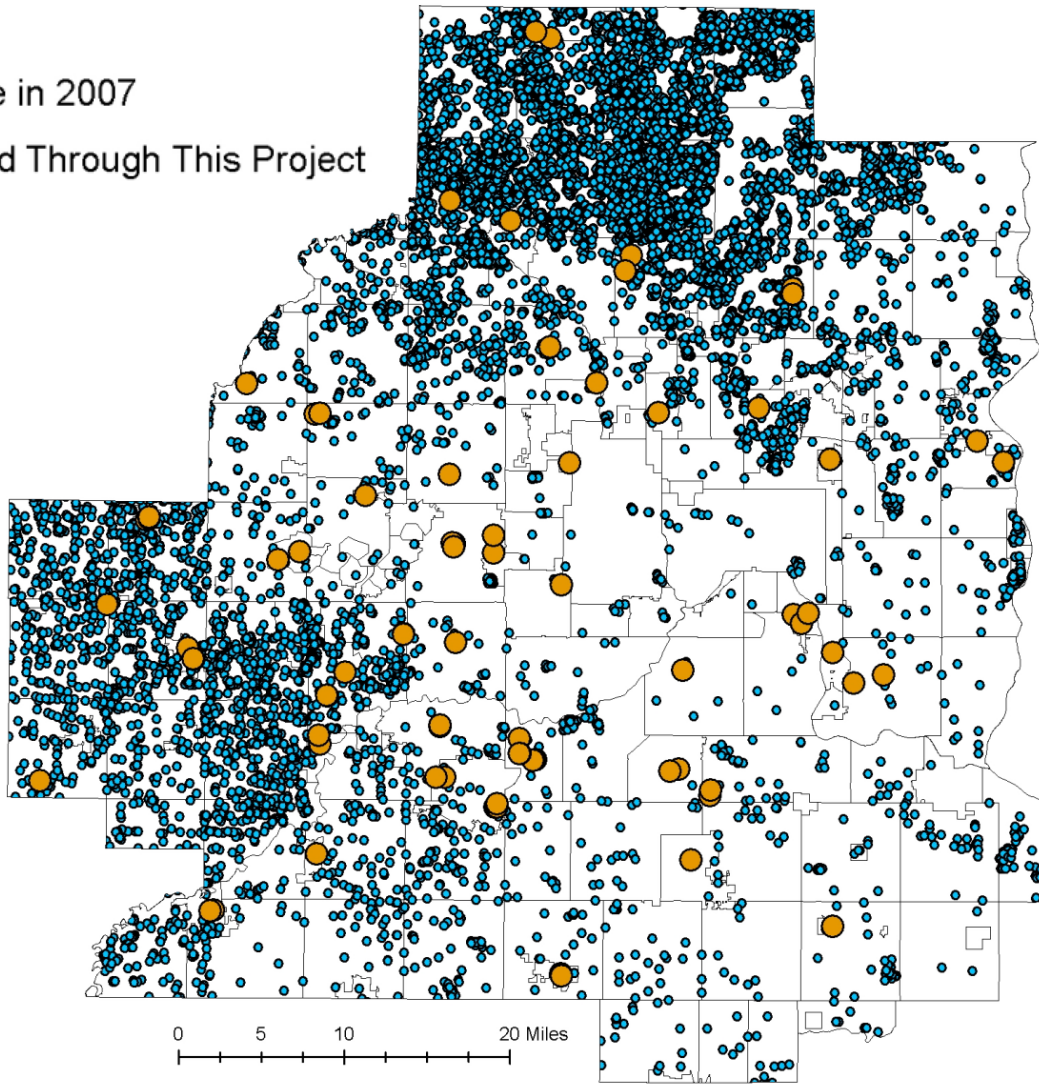
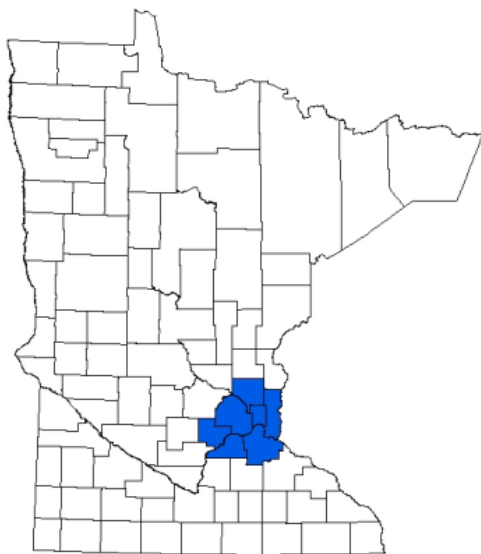
Geologic Mapping & Groundwater Chemistry

- \$74,200
- Complete
- Partnered with Minnesota Geological Survey
- Benefits: improved aquifer management and source water protection



Geologic Mapping & Groundwater Chemistry

- Hydraulic Conductivity Data Available in 2007
- Hydraulic Conductivity Data Compiled Through This Project





Stormwater Reuse Guidance

- \$103,000
- In progress – due 9/30/11
- Partnered with Camp Dresser and McKee
- Benefits: increased planning capability for stormwater reuse
- ***Required by 2011 Legislative appropriation***



Stormwater Reuse Guidance

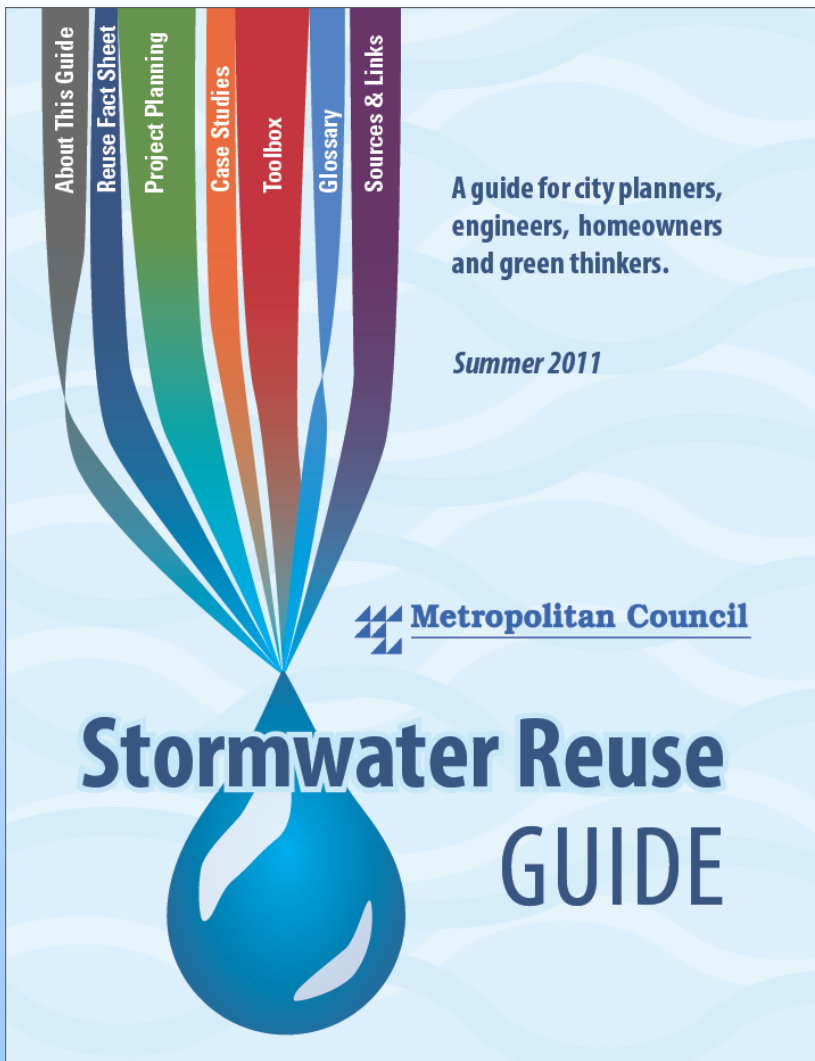





Table of Contents

This guide contains seven sections: About this Guide, Reuse Fact Sheet, Project Planning, Case Studies, Toolbox, Glossary and Sources & Links. Each section could be used as a stand alone section, though they all work together as one comprehensive guide to stormwater reuse.

About This Guide		Discover what is contained in and how to use this guide.
Reuse Fact Sheet		Read through the Reuse Fact Sheet to learn about the topic. Learn about the basics and benefits of stormwater reuse: what, where, when, why and how?
Project Planning		Find step by step instructions that describe how to bring a project to reality. Follow the process of conceptualizing a stormwater reuse project, analyzing how a project will work, and discovering what's needed to design, construct and implement a project.
Case Studies		Find case studies that highlight stormwater reuse projects; local and around the globe.
Toolbox		Use the Toolbox to access quick data or statistics, charts, graphs and tables that assist in development of a stormwater reuse project. The Toolbox can be used as a stand alone resource to access data and information related to stormwater reuse.
Glossary		Find definitions and descriptions for terms and phrases related to stormwater.
Sources & Links		Research information related to storm water reuse, learn more about the case studies featured in this guide and keep up-to-date on current trends in stormwater reuse.

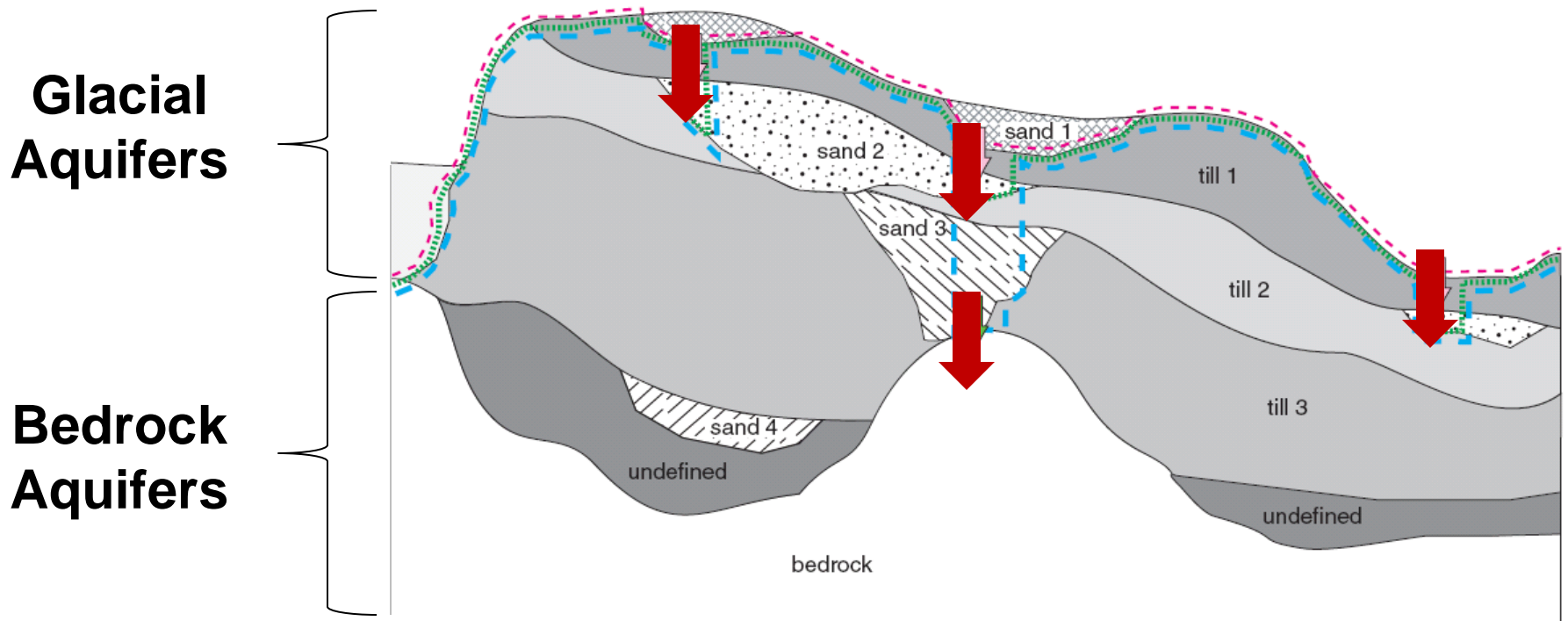


Mapping the Vulnerability of Glacial Aquifers/Plume Maps

- \$115,000
- In progress – due 10/31/11
- Partnered with Minnesota Geological Survey
- Benefits: improved long-term planning for well locations and source water protection
- ***Required by 2011 Legislative appropriation***



Mapping the Vulnerability of Glacial Aquifers/Plume Maps



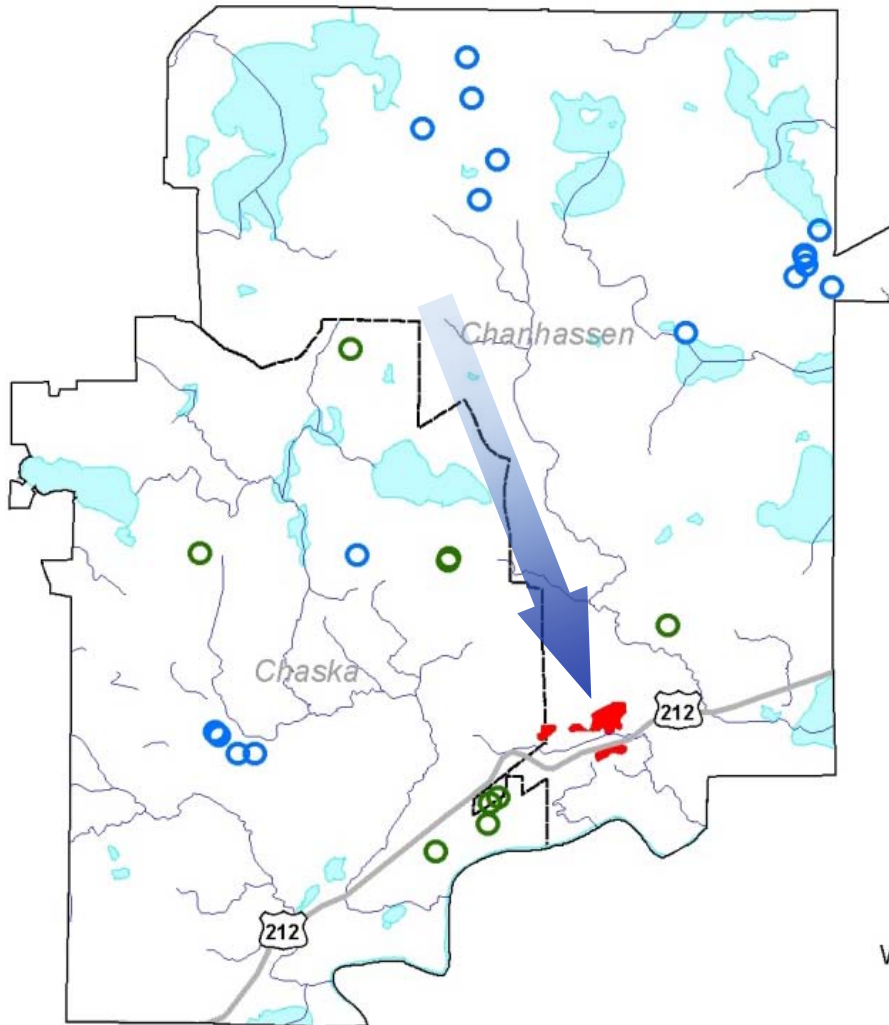


Seminary Fen Protection

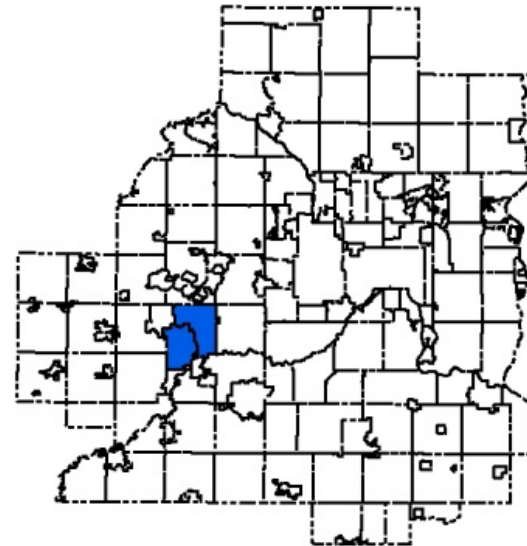
- \$90,000
- In progress
- Partnered with Chaska, Chanhassen, Carver County, Lower MN Watershed District, DNR
- Benefits: improved land use and restoration planning to protect and enhance the fen
- ***Required by 2011 Legislative appropriation***



Seminary Fen Protection



- Municipal Well
- Private High Capacity Well
- Seminary Fen
- ← Groundwater Flow



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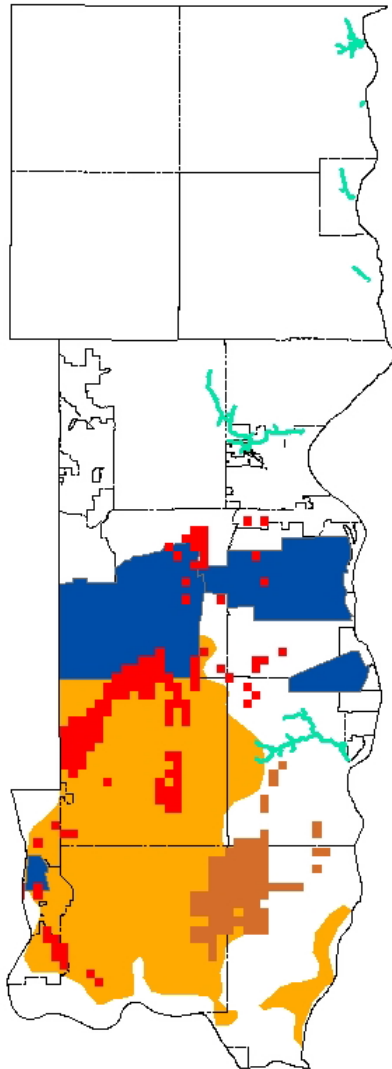


South Washington County Water Supply Plan

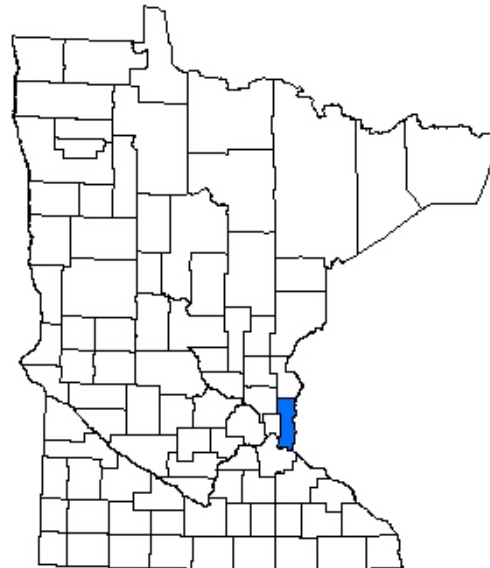
- \$92,000
- In progress
- Partnering with Cottage Grove, Woodbury, Washington County, watershed districts, state agencies
- Benefits: improved planning to ensure high quality water is available while protecting natural resources
- ***Required by 2011 Legislative appropriation***



South Washington County Water Supply Plan



- Trout Stream
- Special Well Construction Area
- 2030 Drawdown > 50% Available Head: Prairie du Chien-Jordan
- 2030 Drawdown > 50% Available Head: Franconia-Ironton-Galesville
- Approximate Extent of PFC Groundwater Plume





Rural Capacity for Source Water Protection

- \$50,000 (estimated)
- In development
- Partners to be determined
- Benefits: improved source water protection methods in rural areas
- Deliverables: benchmark data, summary report



Regional Recharge Model Update

- \$100,000 (estimated)
- In development
- Partners to be determined
- Benefits: improved capability to predict recharge under different land use and climate scenarios
- Deliverables: recharge model, maps, report



Regional Groundwater Flow Model Update

- \$250,000 (estimated)
- In development
- Partners to be determined
- Benefits: improved capability to accurately predict conditions, including seasonal effects
- Deliverables: groundwater flow model, maps, report



Improving Industrial Water Efficiency

- \$100,000 (estimated)
- In development
- Partners will include high demand industries
- Benefits: improved efficiency will decrease metro demand and business costs
- Deliverables: industrial water efficiency benchmarks, audits for selected partners



Evaluation of Stormwater Infiltration BMPs

- \$100,000 (estimated)
- In development
- Partners will include watershed districts
- Benefits: improved use of stormwater BMPs to protect and enhance groundwater
- Deliverables: report, BMP siting guidance



Thank you!

