Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2015 Work Plan

Date of Report: October 15, 2014

Date of Next Status Update Report: September 15th, 2015

Date of Work Plan Approval:

Project Completion Date: August 15, 2018

Does this submission include an amendment request?

PROJECT TITLE: Shoreview Water Consumption and Groundwater Awareness Project

Project Manager: Mark Maloney

Organization: City of Shoreview

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Location: Ramsey County

Total ENRTF Project Budget:		
	ENRTF Appropriation:	**$54,000**
	Amount Spent:	**$0**
	Balance:	**$54,000**

Legal Citation: M.L. 2015, Chp. 76, Sec. 2, Subd. 04i

Appropriation Language:
$54,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with the City of Shoreview to provide biweekly water consumption data to at least 400 residential households for a two year period to determine if additional groundwater can be conserved due to a greater awareness of consumption data. This appropriation is available until June 30, 2018, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Shoreview Water Consumption and Groundwater Awareness Project

II. PROJECT STATEMENT: Provide bi-weekly water consumption data to 400 residential households for a two year period to determine if additional groundwater can be conserved due to a greater awareness of consumption data.

Like many metropolitan municipalities, Shoreview supplies drinking water to residents and businesses via groundwater wells instead of surface water resources. Recent attention concerning the sustainability of our groundwater resources in Minnesota is well documented and could pose a serious threat to future availability. Creating a community conservation ethic should lead to reduced groundwater use. This is needed for long-term aquifer sustainability, especially during the growing season. The City of Shoreview has encouraged and incentivized water conservation for decades, and this proposal will take our efforts one step further. We will determine if access to information and comparisons to neighbors and citywide averages (similar to energy bill comparisons) results in groundwater conservation. We will also determine if there are differences in conservation outcomes between lot sizes and soil types given that irrigation habits vary.

Currently in Shoreview, water users are billed quarterly for their consumption quarterly. With quarterly billing, by the time residents receive their bill, they are likely unaware of where their water was being used collectively in the previous three months. The project will provide 26 times more meter readings to 400 households by making them available on a bi-weekly basis through the existing utility billing website, a separate mailing, or email. Participating homes will also receive a wireless Badger meter reader which display water use in a digital format inside their home (wirelessly synced with their water meter, each cost $125).

Past water use and participant surveys will be analyzed to measure the effects of the project after year one. The program will then be adjusted based on findings prior to year two. If successful, we may consider scaling the project to make the same data available to all households (~10,000) to both increase conscious water use and to further conserve our groundwater resources.

We will provide feedback or comparisons to neighborhood or city averages and hope to convey household water use similar to energy bills, something new in the public water utility realm. We will publish all results and communicate the project's results with the rest of the community and share what we learned with communities interested in pursuing their own awareness projects.

III. OVERALL PROJECT STATUS UPDATES:
Project Status as of September 15th, 2015:

Project Status as of March 15th 2016:

Project Status as of September 15th 2016:

Project Status as of March 15th 2017

Project Status as of September 15th 2017

Project Status as of March 15th 2018

Overall Project Outcomes and Results: A final report and associated products will be submitted between June 30 and August 15, 2018.

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Identify and locate pilot study areas and promote participation in the project.

Description: To set up the project, we will determine suitable neighborhoods to include in the study area based on different lot sizes and soil types. For instance, we want to compare the household water use in large lots in clay soils to smaller lots in clay soils, against the citywide average or control neighborhoods, and the same for sandy soils. (Shoreview has both sandy and clay areas.) We will use existing soil maps and GIS data to determine 6-10 neighborhood clusters of approximately 40-70 households. We expect to include additional households in each neighborhood cluster on the invite to participate, but know that not every household will participate.

Once the neighborhood clusters are identified, we will assign them a unique name for tracking purposes, create mailing lists, and invite residents in that area to participate via mail. We will also compile the past 3-5 years of water data use for all households in these neighborhood clusters to use as the baseline of information.

Packets mailed to participants will include a kick off open house invitation, individual past water uses, information about the project scope and intentions, what is asked of them, and the schedule for the entire project. It will also include information on how to obtain the Badger Water Meter, which they will have to call for an appointment to receive (See Activity 2). Fliers and press releases will be created to inform the larger community of our project as well.

We will host an open house at the Shoreview Community Center for a kick off event. This event will feature signage about the project, possibly a short presentation, and have staff members available to answer questions.

Summary Budget Information for Activity 1:

ENRTF Budget: $ 0
Amount Spent: $ 0
Balance: $ 0

Outcome	Completion Date
1. Select study areas and review past water use	August 1, 2015
2. Mail flier to ~400 households in study area introducing project, invite to public meeting, share past data and conservation tips	Sept 1, 2015
3. Host open house style public meeting to kick off project	Nov 15th, 2015

Activity Status as of September 15th 2015:

Activity Status as of March 15th 2016:

Activity Status as of September 15th 2016:

Activity Status as of March 15th 2017

Activity Status as of September 15th 2017

Activity Status as of March 15th 2018

Final Report Summary:

ACTIVITY 2: Create methods to conduct additional readings and make data available
Description:

Prepare the back end of the program with changes to our utility billing system and purchase the Badger water meters ($50,000) to have available to promote at the kick off meeting.

Seek outside assistance to website programming and the online component of the program in coordination with relevant city staff to create the program attributes. When a private party is hired we will use a competitive RFP process. The coding would include compiling a template to display past water use, comparables to other neighbors, and/or a citywide average for household water consumption. This would be in graphical form and available in an online, email, or hard copy format to the resident. Each participant will have a Badger water meter in their household, but the overall tracking of consumption will be analyzed by the City in Activity 3 below.

Summary Budget Information for Activity 2:

ENRTF Budget: $ 54,000
Amount Spent: $ 0
Balance: $ 54,000

Outcome	Completion Date
1. Create method to host additional information (standard template to compare household use to past data and other households) on City utility billing website	Sept 1, 2015
2. Purchase 400 Badger Orion CE In Home Display meter readers ($125 each)	Sept 1, 2015

Activity Status as of September 15th 2015:

Activity Status as of March 15th 2016:

Activity Status as of September 15th 2016:

Activity Status as of March 15th 2017

Activity Status as of September 15th 2017

Activity Status as of March 15th 2018

Final Report Summary:

ACTIVITY 3: Conduct bi-weekly water use readings and set up Badger readers in 400 households and then analyze data.

Description: The 400 participants will receive a Badger water meter with programming to be completed by utility crew members. The same staff will conduct bi-weekly meter readings for the entire study area which participants will receive via email, mail, or online.

Staff will tabulate results every 6 months to track trends and compare overall water use to past data and see if there are differences in lot sizes or soil types. After two years of data collection we will evaluate participation, estimate groundwater resources conserved, and publish findings.

Staff will develop a survey for participants to self-report on impacts of the additional information on their household water habits.

A final report of all data, survey responses, and conservation outcomes will be distributed to the City Council, published in a City newsletter, and be shared with local newspapers.

Summary Budget Information for Activity 3:

ENRTF Budget: $ 0

Amount Spent: $ 0

Balance: $ 0

Outcome	Completion Date
1. Utility crew member program Badger reader with resident and obtain water use bi-weekly by driving by to collect wireless water meter readings	Bi-weekly 2016-2017
2. Utility Accountant to publish readings using template	Bi-weekly 2016-2017
4. Conduct survey of participants and tabulate perceived impacts of project. Return meters to City for future participants. Compare overall use, and gallons conserved, normalize for weather.	Jan-March 2018
5. Report findings in City newsletter, press release, online	Summer 2018

Activity Status as of September 15th 2015:

Activity Status as of March 15th 2016:

Activity Status as of September 15th 2016:

Activity Status as of March 15th 2017

Activity Status as of September 15th 2017

Activity Status as of March 15th 2018

Final Report Summary:

V. DISSEMINATION:

Description: A final report of all data, survey responses, and conservation outcomes will be distributed to the City Council, published in a City newsletter, and be shared with local newspapers. Information about the project and status updates, as well as conclusions will be posted on the City's website at www.shoreviewmn.gov.

Status as of September 15th 2015:

Status as of March 15th 2016:

Status as of September 15th 2016:

Status as of March 15th 2017

Status as of September 15th 2017

Status as of March 15th 2018

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	$ Amount	Overview Explanation
Personnel:	$	
Professional/Technical/Service Contracts:	$ 3,000	Utility billing website programming, coding, updates
Equipment/Tools/Supplies:	$ 50,000	Purchase of 400 Badger water meter readers
Printing/Other:	$ 1,000	Printing and postage for ~500 invitations, bi-weekly updates, surveys at end of project
TOTAL ENRTF BUDGET:	**$ 54,000**	

Explanation of Use of Classified Staff: N/A

Explanation of Capital Expenditures Greater Than $5,000: N/A

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: N/A

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: N/A

B. Other Funds: All support provided by existing City staff members as in kind support, funding secured.

VII. PROJECT STRATEGY:

A. Project Partners: All project team members are current full time City staff receiving salary and benefits, which is considered in kind funding to this project, other than the website programmer detailed below.
Mark Maloney, Project Manager will coordinate all activities relating to managing the project and resident outreach.
Terese Roesler, Utility Accounting will tabulate past data and household comparisons for the study area.
Our Utility crew will be responsible for the additional meter reads as well as programming the Badger water readers for residents with an appointment.
A consultant or website programmer will create additional features within our existing utility billing website for residents to logon and see water use that is user-friendly. This new programming will have the ability to send out automated bi-weekly updates with minimal staff time. *This consultant is not yet contracted, but would be selected through City's RFP process

B. Project Impact and Long-term Strategy:

The City of Shoreview has encouraged and incentivized water conservation for decades. The City implemented a tiered water conservation rate structure before the MN DNR required them, has an odd/even sprinkling ban, and promotes additional conservation measures in multiple ways to both residents and businesses.

Additional background on our water system and conservation efforts include: The City's water system includes 100 miles of water main pipe, 6 wells, and 1,200 hydrants. There is a million gallon underground storage reservoir which holds water that is pumped to the two water towers and into the system. During the winter months, one well produces about 1.5 million gallons of water per day. During peak demand periods, mainly summer months, it may be necessary to run all six wells to meet water requirements. When necessary, the wells can produce up to 11 million gallons a day. The water is chlorinated and fluoridated to meet Minnesota Department of Health standards. The water utility is not funded through taxes. Operating costs are covered by billing for metered water use. All of Shoreview's water comes from an aquifer, not surface water. Our wells have sensors that detect drops, and none have been reported to date.

Other Steps the City has taken towards water conservation:

* Odd/even watering ban helps to level out high peak days, which reduces need for additional wells and storage infrastructure to be built

* In 2013 transitioned from a 3 tier to a 4 tier conservation rate structure for water billing. Users using the most water will pay a higher rate as follows:

> **Tier 1:** The first 5 thousand gallons per unit is billed at $1.08 per thousand gallons (about 9.3 gallons for each penny).
> **Tier 2:** The second 5 thousand gallons per unit is billed at $1.74 per thousand gallons (about 5.7 gallons for each penny).
> **Tier 3:** The next 20 thousand gallons per unit is billed $2.41 per thousand gallons (about 4.1 gallons for each penny).
> **Tier 4:** Remaining water is billed at the highest rate of $3.96 per thousand gallons (about 2.5 gallons for a penny).

Compared to bottled water, tap water is remarkably inexpensive. For instance, a gallon of self-serve spring water costs about 30-cents while 30-cents buys 279 gallons of Shoreview tap water at the lowest tier, and buys 75 gallons at the highest tier.

* Variable frequency drive wells – dials up the well pump slowly and saves energy
* Meter install program – accounting for all but about 8% of water (2009)
* Leak postcards – sent to properties with a detected leak so it can be remedied
* Water emergency conservation plan in place
* Wellhead protection plan – involves planning to manage land use within our aquifer's drainage area
* The Maintenance Center captures rainwater from the roof and is used to wash the City's trucks in our LEED Gold Maintenance Center
* Participates in both the Regional Indicators Initiative and the Minnesota GreenStep Cities programs to track and analyze water use and identify additional conservation opportunities
* Ongoing education efforts by the City's Environmental Quality Committee (ShoreViews newsletters, tips, Speaker Series presentations, Green Community Awards program, etc.)

Given these efforts we believe the time gap from our current quarterly water billing schedule doesn't provide an adequate picture of gallons of water consumed to the average resident. The proposal allows for a bi-weekly update and in home access to household water consumption for one year, which may alter behaviors and show support for conservation. Again we feel that this project will take our efforts above and beyond our current operations and educational programs.

If water use is decreased due to a greater awareness, the City may make the data available in real time to others in the future. There is also a possibility that other entities using groundwater may offer similar data to their users to further encourage awareness and conservation.

C. Funding History: N/A

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:

A. Parcel List: N/A

B. Acquisition/Restoration Information: N/A

IX. VISUAL COMPONENT or MAP(S): See attached table

X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than September 15th and March 15th of each year of the three year project.
Specific dates include:

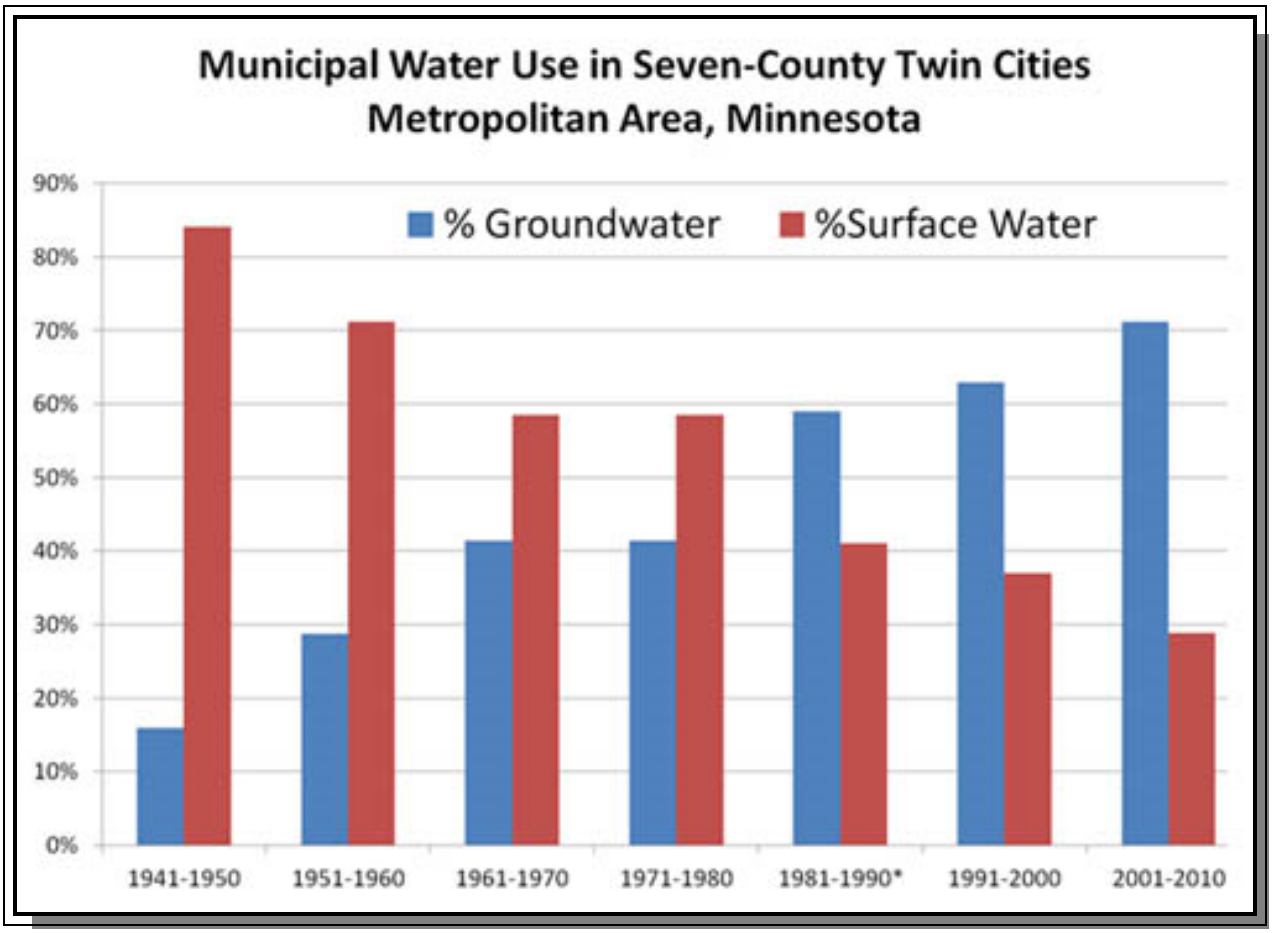
- September 15th, 2015
- March 15th 2016
- September 15th 2016
- March 15th 2017
- September 15th 2017
- March 15th 2018

A final report and associated products will be submitted between June 30 and August 15, 2018.

Environment and Natural Resources Trust Fund
M.L. 2015 Project Budget

Project Title: Shoreview Water Consumption and Groundwater Awareness Project
Legal Citation:
Project Manager: Mark Maloney
Organization: City of Shoreview
M.L. 2015 ENRTF Appropriation: $ 54,000
Project Length and Completion Date: 3 years, July 2018
Date of Report:

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	**Identify and locate pilot study areas and promote participation in the project.**			**Create methods to conduct additional readings and make data available**			**Conduct bi-weekly water use readings and set up Badger readers in 400 households and analyze data.**				
Personnel (Wages and Benefits)											
Exisitng city staff (all in kind contributions)											
Professional/Technical/Service Contracts											
Website programmer. Contract sought will use competive process.				$3,000	$0	$51,000				$3,000	$3,000
Equipment/Tools/Supplies											
Purchase 400 individual Badger Water Meters for residential use (each is $125)				$50,000	$0	$1,000				$50,000	$50,000
Printing/Other											
Publication and printing off invitation packets, postage for invitation packets, monthly summaries, and the publication and posting for mailed surveys at end of project				$1,000	$0	$0				$1,000	$1,000
COLUMN TOTAL	**$0**	**$0**	**$0**	**$54,000**	**$0**	**$52,000**	**$0**	**$0**	**$0**	**$54,000**	**$54,000**



Since 1940, the balance of the region's use of surface water to groundwater has shifted dramatically. Chart courtesy of the Metropolitan Council 8/14/2013.

The Badger Meter Reader is one tool to show real time water consumption to households.