

**Environment and Natural Resources Trust Fund
2010 Request for Proposals (RFP)**

LCCMR ID: 004-A1

Project Title:

Next Generation in Water Supply Management-Pilot Studies

LCCMR 2010 Funding Priority:

A. Water Resources

Total Project Budget: \$ \$945,500

Proposed Project Time Period for the Funding Requested: 2 years, 2010 - 2012

Other Non-State Funds: \$ \$0

Summary:

This proposal seeks to develop and test a framework that will guide sustainable water management across governmental jurisdictions and natural hydrologic units.

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Sponsoring Organization: DNR

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Location:

Region: Statewide

County Name: Clay, Kandiyohi, Pope, Stearns, Wilkin

City / Township:

_____ Knowledge Base	_____ Broad App.	_____ Innovation
_____ Leverage	_____ Outcomes	
_____ Partnerships	_____ Urgency	_____ TOTAL

MAIN PROPOSAL

PROJECT TITLE: NEXT GENERATION IN WATER SUPPLY MANAGEMENT – PILOT STUDIES

I. PROJECT STATEMENT

In order to conserve and yet sustainably utilize our water supply resources, a next generation in water supply management strategies is needed. This proposal seeks to develop and implement a framework that may be used to guide water management across governmental jurisdictions and natural hydrologic units. Traditional water management is based on political boundaries. In the future, water management will likely be based on surface watersheds. The natural management unit for groundwater is the aquifer, which may extend across political, ecological and surface watershed boundaries.

Two pilot study areas have been selected to develop new water use management strategies. Each of these areas encompasses multiple watersheds, aquifers, types of water uses and governmental jurisdictions, with differences being in the complexity of their groundwater systems and community perspectives on water supply management. One of the pilot areas encompasses portions of Clay County including but not limited to the Buffalo Aquifer along the South Fork Buffalo River. Although in recent history the area is known for an excess of water, water supply managers for the City of Moorhead and Clay County, which are partners in this project, want to balance water use from surface water and groundwater to assure an adequate drinking water supply during a prolonged drought similar to that of the 1930s. The other study area, the Bonanza Valley, is in Stearns, Pope and Kandiyohi Counties. This area is often considered to be water rich and, until recently, has supported agricultural irrigation without fully understanding the impact to human and ecologic systems. Several years of reduced precipitation and increased irrigation have resulted in water use conflicts.

This project will address potential future potential water supply problem scenarios related to both quantity and quality before they actually occur. This project will undertake scientific assessments which will lead to the identification of recharge areas in the study areas including potential quantity and quality vulnerabilities. Previous studies in these areas indicated a strong connection between groundwater and surface water. These technical studies were primarily focused on determining how much water is available to be removed without consideration of the impacts of the withdrawals on the entire hydrologic and ecologic system. This project will leverage updated and expanded aquifer data and maps from county geologic atlases, biologic surveys and regional basin studies, and ongoing water quality analyses to update and enhance earlier hydrologic models. General information will be shared through regional partners and community meetings. External technical guidance and options for resource management and framework development will be accomplished through technical expert workshops. Information will be made publically available and stored in a web-based format that conforms to state standards.

Locally supported water management plans for each pilot study area will be established. From these pilot studies, management response to diverse watershed scenarios will be developed. Implications of land and water uses and their relation to water quantity and quality will be considered. The outcome will be a framework and tools that are practical, replicable, scalable and useable for sustainable water management by and for the next generation.

II. DESCRIPTION OF PROJECT RESULTS

Result 1: Compilation of existing and new data

Budget: \$ 463,500

Results will be aggregated from past and ongoing data collection including geologic mapping, well inventories, hydrogeologic interpretations, surface water gaging, biologic surveys, wellhead protection studies, TMDL analyses, ground and surface water levels, and agricultural water quality analyses. Additional data will be gathered through new gaging stations and monitoring wells and selected resource (aquifer) testing.

Deliverable

Completion Date

1. Database created.

October 31, 2010

2. Installation of additional monitoring points, resource testing conducted.

April 30, 2011

Next Generation in Water Supply Management – Pilot Studies

Result 2: Water model update and enhancement

Budget: \$ 267,000

In order to build upon multiple previous studies and to utilize the considerable knowledge and abilities of this federal agency, the USGS will be engaged to update earlier hydrologic models. These models will assist in identifying potential recharge areas and impacts of groundwater withdrawal on surface waters and ecologic systems. This result will include an uncertainty analysis of the model which will identify areas of inadequate data. These findings will inform decisions about additional monitoring and testing.

Deliverable

1. Data compiled in Result 1 incorporated in models
2. Model scenarios developed
3. Models for both pilot studies updated
4. Addendum report for water supply management plan

Completion Date

April 30, 2011
December 31, 2011
December 31, 2011
June 30, 2012

Result 3: Civic engagement and framework development

Budget: \$ 92,000

The involvement of local governments and external partners is essential for the success of this project. Communities will be involved through the engagement of community groups, public meetings and web based information. Technical expert review and input will be engaged in framework development through a series of workshops.

Deliverable

1. A minimum of two community meetings held in each pilot area
2. Technical expert workshops conducted and findings incorporated into framework
3. Web-based community communication established and maintained

Completion Date

June 30, 2012
March 31, 2012
June 30, 2012

Result 4: Framework and tools for water supply management

Budget: \$ 123,000

The result of these pilot studies will be a framework and tools for locally supported water supply management that is usable for large and small scale watershed management, considers ground and surface water, incorporates ecologic and economic considerations and conserves and yet sustainably utilizes our water resources. In addition to this framework, recommendations will be made for improved cooperative water management strategies.

Deliverable

1. Identification of recharge and discharge for each area
2. Pilot study areas water supply management plan
3. Framework for creation of water supply management plans

Completion Date

June 30, 2012
June 30, 2012
June 30, 2012

III. PROJECT STRATEGY

A. Project Team/Partners

Department of Natural Resources—project lead and data gathering; City of Moorhead and Clay County-local government leaders; Department of Health, Department of Agriculture and Pollution Control Agency-water quality assessments; Freshwater Society, the Univ. of Minn. Water Resource Center, Minnesota Rural Water Assoc.-framework development and civic engagement; US Geological Survey - technical support and modeling; Buffalo-Red River Watershed District – local involvement.

B. Timeline Requirements

This project will be conducted over a period of two years with anticipated report completion by June 30, 2012. Actual implementation of management plans for the pilot areas will continue after project completion. The duration and extent of this aspect will be one of the components of the pilot studies' management plans.

C. Long-Term Strategy

In addition to gathering new data and identifying recharge areas, this project will use the results to produce a framework and tools for system analysis and management of water on a watershed basis. The framework and tools will provide flexible guidance for future, long-term water supply management on a watershed basis. Future requests for LCCMR funding in these areas are not anticipated.

Project Budget

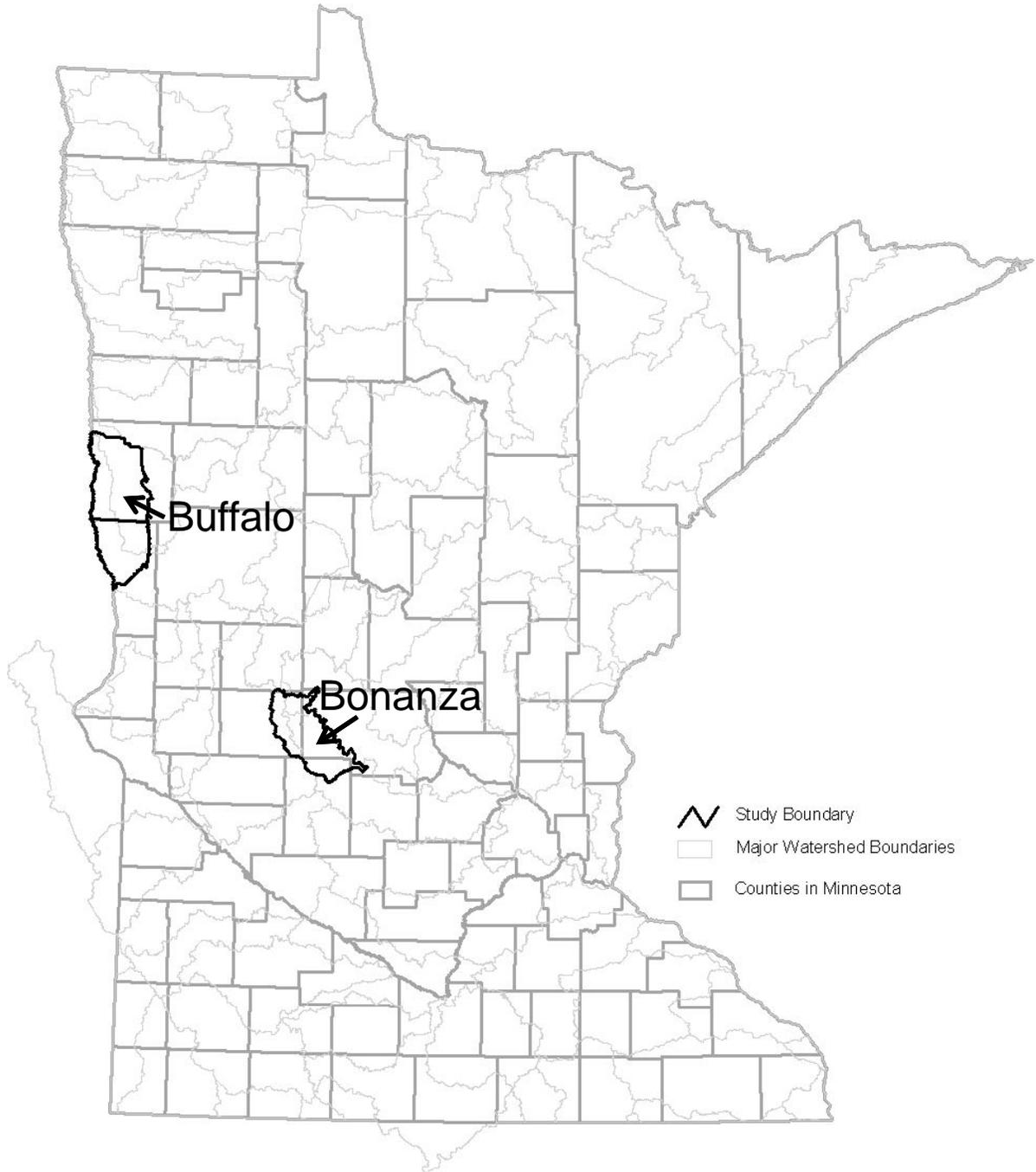
IV. TOTAL PROJECT REQUEST BUDGET (2 years)

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
Personnel:	
NR Project Consultant - 1 FTE - July 2010 to June 2012 - salary +25% benefits	\$ 205,000
Information Technology Specialist - 1/4 FTE - July 2010 to June 2012 - salary + 25% benefits	\$ 36,000
Contracts:	
United States Geological Survey: modeling, groundwater/surface water model	\$ 241,500
Well driller TBD: well installation and documentation	\$ 80,000
Water Resource Center University of Minnesota and the Freshwater Society: workshops, community involvement, framework development	\$ 40,000
Equipment/Tools/Supplies:	
Data loggers and power accessories, flow meters, pressure transducers, GIS computer and software, field laptop computer and software, steel tapes and chalk, drilling supplies, current meters, protective field gear, GPS receivers, telecommunications remote equipment and installation	\$ 311,000
Travel: In-state - DNR travel for monitoring point installation, data collection, well installation, meeting attendance - Meals and lodging = \$16,500 + mileage = \$15,500	\$ 32,000
TOTAL PROJECT BUDGET REQUEST TO LCCMR	\$ 945,500

V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
In-kind Services During Project Period:		
DNR Area Hydrologists - 1/4 FTE local contacts	\$ 46,200	pending
Project Manager (H3) - 1/4 FTE	\$ 49,500	pending
Hydrologist 1 - 1/4 FTE data management and field work	\$ 36,800	pending
City of Moorhead-monitoring levels and sampling, meetings, web development, scenario identification, plan development, public review and adoption	\$ 65,600	pending
United States Geological Survey - 30% contribution toward model development	\$ 103,500	pending

Next Generation in Water Supply Management – Pilot Studies



LCCMR Proposal 2010

Title: Next Generation in Water Supply Management – Pilot Studies

Project Manager Qualifications:

Laurel D. Reeves, P.G.

Professional Geologist License #30707

DNR Waters Hydrogeologist

Manager - Water Appropriation Permit program

Surface and ground water allocations,;

Water management planning;

Water availability analyses.

Manager - Ground Water Level Monitoring – 1990 to 2006

Plan, coordinate and manage ground water level data statewide;

Plan, coordinate and manage an ongoing well and monitoring point maintenance, sealing and drilling program;

Initiate studies, analyses and reports on water resource management issues.

DNR Waters and MPCA hydrologist – 1981 to 1990

Water appropriation and protected waters permits and inventory;

Solid waste and superfund permits and enforcement;

Environmental review, public drainage project review, local water planning.

Soil Exploration Co./Twin City Testing – geologist – 1970 - 1980

Publications:

Hydrogeologic Characterization of Six Sites in Southeastern Minnesota Using Borehole Flowmeters and Other Geophysical Logs, USGS Water-Resources Investigation Report 00-4142, 2000, co-authors;

Minnesota's Water Supply: Natural Conditions and Human Impacts; 2000;

Laurel D. Reeves & John Linc Stine, editors.

Professional leadership:

President 2005 - Minnesota Ground Water Association.

Presentations:

Freeman Forum, Minnesota Environmental Initiative, Citizens League, Minnesota Geological Society, American Institute of Hydrologists, American Water Works Assoc., Minn. Water Well Assoc., Minn. Ground Water Assoc., municipal water engineers, watershed districts, Irrigator's Association, Minnesota Assoc. of Townships, Growing Greener Workshops, American Assoc. of Univ. Women, DNR Regional Managers, and DNR Parks managers - on water supply & management, water & ethanol, resource sustainability, ground and surface water, and the hydrologic cycle.

Organization Description:

Minnesota Department of Natural Resources, Waters Division