

Trust Fund 2008 Work Program and Trust Fund 2009 Work Program

Date of Report: 4/17/09

Date of Next Status Report: 7/1/09

	M.L. 2008	M.L. 2009
Date of Work program Approval:	June 10, 2008	June xx, 2009
Project Completion Date:	June, 30 2011	June 30, 2012

I. PROJECT TITLE: South-Central MN Groundwater Monitoring and County Geologic Atlases; and County Geologic Atlas Acceleration

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Location: Nicollet, Blue Earth, Sibley Counties; Anoka and Wright Counties

	M.L. 2008	M.L. 2009	Total
Total Trust Fund Project Budget:	\$1,600,000	\$2,695,000	\$4,295,000
<i>DNR Total</i>	<i>\$894,000</i>	<i>\$1,875,000</i>	<i>\$2,769,000</i>
<i>MGS Total</i>	<i>\$706,000</i>	<i>\$820,000</i>	<i>\$1,526,000</i>
MGS Trust Fund Appropriation	\$706,000	\$820,000	\$1,526,000
Minus Amount Spent:	\$25,217	\$0	\$25,217
MGS Equal Balance:	\$680,783	\$820,000	\$1,500,783

Legal Citation:

ML 2008, Chap.367, Sec.2, Subd.4(h).

Appropriation Language: \$1,600,000 is from the trust fund for collection and interpretation of subsurface geological information and acceleration of the county geologic atlas program. \$706,000 of this appropriation is to the Board of Regents of the University of Minnesota for the Geological Survey to begin county geologic atlases in three counties. \$894,000 of this appropriation is to the commissioner of natural resources to investigate the physical and recharge characteristics of the Mt. Simon aquifer. This appropriation represents a continuing effort to complete the county geologic atlases throughout the state. This appropriation is available until June 30, 2011, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

Legal Citation: ML 2009, Chap.143, Sec.2, Subd.3(b)

Appropriation Language: \$2,695,000 is from the trust fund for collection and interpretation of subsurface geological information and acceleration of the county geologic atlas program. \$820,000 of this appropriation is to the Board of Regents of the University of Minnesota for the geological survey to continue and to initiate the production of county geologic atlases. \$1,875,000 of this appropriation is to the commissioner of natural resources to investigate the physical and recharge characteristics of the Mt. Simon aquifer. This appropriation represents a continuing effort to complete the county geologic atlases throughout the state. This appropriation is available until June 30, 2012, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

II. PROJECT SUMMARY AND RESULTS FOR 2008 AND 2009 PROJECTS:

The two main objectives for these projects included: investigating the physical and recharge characteristics of the Mt. Simon aquifer to begin understanding the sustainable limits of this resource; and to gather high quality data on the overlying geologic materials to aid future mapping of the buried sand and gravel aquifers of the region.

This work plan will advance geologic mapping for the purpose of ground water management in the region. The attached pyramid diagram shows the basic dependencies of the typical atlas tasks beginning on the bottom with basic data collection, data verification, and database development. Every layer of the pyramid builds on the previous layer ending at the top with county scale hydrogeologic maps.

Monitoring wells (observation wells) will be drilled and completed at approximately 13 locations with contracted drilling services hired and coordinated by the DNR. The wells will be completed in the lowermost bedrock aquifer (Mt. Simon Formation), and possibly shallower aquifers, on public property in the seven county project area to depths of 150 to 1000 feet. The wells will be sampled for chemical constituents that will help determine the residence time or age of the ground water in this aquifer. The wells will be instrumented with continuous water level recording equipment. These data will help determine aquifer recharge characteristics and sustainable limitations for future use. A groundwater level monitoring guidance document will be developed by the DNR to define the purposes and procedures for maintaining and developing statewide monitoring.

M.L. 2008

The 2008 project will also initiate Part A County Geologic Atlases by the Minnesota Geological Survey for Sibley, Blue Earth, and Nicollet counties. These atlases describe the location, size, and boundaries of aquifers. This result will also establish digital locations and geologic interpretations for wells and enter the information in the County Well Index for Nicollet, Blue Earth, and Sibley counties. MGS will train county staff to establish the digital locations. Part A atlases establish the basic geologic and database framework for subsequent DNR Part B hydrogeological evaluations.

M.L. 2009

The 2009 project will initiate Part A County Geologic Atlases by the Minnesota Geological Survey for Anoka County and Wright County.

These projects will create both short and long-term benefits for the people and natural resources of the region. The information generated by these projects will be immediately useful to water management scientists, planners, drillers, consultants, industrial users, and municipal officials for understanding and assessing local ground water conditions for protection and wise use.

III. PROGRESS SUMMARY AS OF 12/31/08:

M.L. 2008

After the project was chosen for funding Le Sueur County decided it was unable to participate. Sibley County took advantage of this opportunity. MGS staff prepared the well records that needed locations established and trained county staff to perform that task. Blue Earth County has located 55% of these wells, Sibley County 80%, and Nicollet County has located some wells but not transferred those locations to MGS yet. This is close to the rate of progress we anticipated. MGS geologists are interpreting the well records as they are entered in the CWI database. MGS staff have reviewed existing maps, data, and sample sets and are actively collecting new information, such as downhole geophysical data. Existing data has been compiled in GIS projects for use by the mappers. Data and interpretations from sediment load studies in the Minnesota River and tributaries are being incorporated into the appropriate county data sets.

M.L. 2008

N/A

IV. OUTLINE OF PROJECT RESULTS:

Result 1: Groundwater level monitoring guidance document (to be completed by DNR, separate work program)

Result 2: Test drilling, monitoring well installation, sampling, laboratory analysis, water level measurement (to be completed by DNR, separate work program)

Result 3: Initiate County Geologic Atlases

M.L. 2008

Initiate Part A County Geologic Atlases for Blue Earth, Nicollet, and Sibley Counties. Note: all components listed below may not be completed within the time frame and budget of this project, but substantial progress in all three counties is anticipated.

M.L. 2009

Initiate Part A County Geologic Atlases for Anoka County and Wright County. Note: all components listed below may not be completed within the time frame and budget of this project, but substantial progress in both counties is anticipated.

Description:

- create geologic maps, illustrations, and databases in print and GIS formats.
- location, boundaries, size, and hydrologic characteristics of aquifers and the materials that confine them in these counties.
- these maps are essential information in efforts to protect and wisely allocate ground water and they support these related activities and programs:
 - ground water monitoring, wellhead protection, ground water allocation, well construction, wellfield design, facility siting, permitting, application of agricultural best management practices, remediation, and management of ground water dependent surface water features (springs, fens, lakes, rivers).
- products:
 - maps of bedrock geology, surficial geology, subsurface Quaternary geology, bedrock topography, and thickness of glacial deposits
 - database of well construction records to support the mapping, describe water use, and to help resolve well problems; scientific test drilling as necessary

Summary Budget Information for Result 3:

	M.L. 2008	M.L. 2009	Total
Trust Fund Budget:	\$630,200	\$761,000	\$1,391,200
Amount Spent:	\$25,217	\$0	\$25,217
Balance:	\$604,983	\$761,000	\$1,365,983

Deliverable	Completion Date	Budget	Status
1. M.L. 2008: CWI databases for 3 counties	6/30/09	\$19,040	
2. M.L. 2008: geologic maps	6/30/11	\$610,600	
3. M.L. 2009: CWI databases for 2 counties	6/30/10	\$ 18,000	
4. M.L. 2009: geologic maps	6/30/12	\$743,000	

Completion Date: M.L. 2008: 6/30/11; M.L. 2009: 6/30/12

Result Status as of 12/1/08: Efforts are focused on collection and compilation of new and existing data, especially establishing accurate, digital locations for water wells so that the information they contain can be used to support geologic maps. We are also examining, describing, and interpreting drill cuttings and other existing samples.

Result Status as of 7/1/09:

Result Status as of 12/1/09:

Result Status as of 6/30/10:

Result Status as of 12/1/10:

Result Status as of 6/30/11:

M.L. 2008 Final Report Summary:

Result Status as of 12/1/11:

Result Status as of 6/30/12:

M.L. 2009 Final Report Summary:

Result 4: MGS support for DNR Drilling Program

Description: MGS will process, examine, interpret, and archive samples from the DNR test drilling. MGS will also conduct downhole geophysical logging of selected test holes to observe aquifer properties.

Summary Budget Information for Result 4:

	M.L. 2008	M.L. 2009	Total
Trust Fund Budget:	\$75,800	\$0	\$75,800
Amount Spent:	\$0	\$0	\$0
Balance:	\$75,800	\$0	\$75,800

<u>Deliverable</u>	<u>Completion Date</u>	<u>Budget</u>	<u>Status</u>
1. report to DNR	6/30/11	\$75,800	

Completion Date: M.L. 2008: 6/30/10

Result Status as of 12/1/08: MGS provided DNR with geophysical logs in the vicinity of their new drilling to facilitate siting the holes, and interpreting the samples and new geophysical surveys. We also provided downhole logging of 2 of the 3 holes drilled so far. MGS has processed and archived the samples delivered by DNR and also conducted textural analysis of one of the two sample sets delivered. We have conducted downhole logging of 8 "holes of opportunity" in the project area to support mapping. We failed to differentiate the cost of these activities from the cost of activities under result 3 so far, however the activity in this area has been minimal. We will recover this data and include it in our next report.

Result Status as of 7/1/09:

Result Status as of 12/1/09:

Result Status as of 6/30/10:

Result Status as of 12/1/10:

Result Status as of 6/30/11:

Final Report Summary:

Result 5: Production and Printing of the Benton and Chisago County Geologic Atlases

Description:

- Take the geologic maps and databases from 2007 work program through the technical review, editing, production, and printing phases
- products:
 - printed maps of bedrock geology, surficial geology, subsurface Quaternary geology, bedrock topography, and thickness of glacial deposits
 - A CD or DVD package of digital versions of the products in several formats appropriate for the varying technology levels of users

Summary Budget Information for Result 5:

	M.L. 2008	M.L. 2009	Total
Trust Fund Budget:	\$0	\$59,200	\$59,200
Amount Spent:	\$0	\$0	\$0
Balance:	\$0	\$59,200	\$59,200

<u>Deliverable</u>	<u>Completion Date</u>	<u>Budget</u>	<u>Status</u>
1. printed maps and DVD	6/30/10	\$59,200	

Completion Date: M.L. 2009: 6/30/10

Result Status as of 12/1/09:

Result Status as of 6/30/10:

Final Report Summary:

V. TOTAL TRUST FUND PROJECT BUDGET:

M.L. 2008

Personnel:	\$510,412
Contracts:	\$125,000
Equipment/Tools/Supplies	\$ 18,060
Acquisition, including Easements:	\$ 0
Travel:	\$52,528
Other:	\$ 0
2008 TRUST FUND PROJECT BUDGET:	\$706,000

Explanation of Capital Expenditures Greater Than \$3,500: *none*

M.L. 2009

Personnel:	\$570,216
Contracts:	\$ 97,101
Equipment/Tools/Supplies	\$ 98,883
Acquisition, including Easements:	\$ 0
Travel:	\$ 54,000

Other:	\$ 0
2009 TRUST FUND PROJECT BUDGET:	\$820,200

Explanation of Capital Expenditures Greater Than \$3,500:

Soil Probe and carrier truck:	\$62,000
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The Minnesota Geological Survey relies primarily on water well records for subsurface geologic data. This is augmented by 1 to 3 rotasonic test borings approximately 250 feet deep, and 100 to 200 shallow borings less than 25 feet deep. The shallow borings are drilled with a truck mounted auger owned by MGS. This project will purchase a new auger and truck to augment our current equipment. The acceleration of the program requires a second set of equipment.

Repair of a downhole flow meter tool:	\$9,000
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MGS lowers several types of measuring probes into water wells or test borings to record physical properties of the surrounding earth materials, or the water in the borehole and adjacent aquifers. Our flowmeter probe was damaged during previous use and these funds will repair it for use on this project and future atlases.

Downhole Video Camera and Recorder	\$15,000
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A downhole video camera provides us with the ability to see geologic strata in uncased intervals of wells or test borings. This is useful in interpreting the geology, and also in assessing the suitability of the hole for deploying the downhole flow meter or other tools. Seeing the conditions in advance will help us avoid tool loss or damage in holes with obstructions or problematic construction.

VI. OTHER FUNDS & PARTNERS:

A. Project Partners:

M.L. 2008

Minnesota Geological Survey, total from 2008 appropriation	\$706,000
Nicollet County (well location verification)	in-kind contribution
Blue Earth County (well location verification)	in-kind contribution
Sibley County (well location verification)	in-kind contribution

M.L. 2009

Minnesota Geological Survey, total from 2009 appropriation	\$820,200
Anoka County (well location verification)	in-kind contribution
Wright County (well location verification)	in-kind contribution

B. Project Impact and Long-Term Strategy:

County Geologic Atlases provide information essential to sustainable management of water resources. Atlases are completed or underway for 25 of Minnesota's 87 counties. The products also support and enhance the activities of other agencies

such as ground water monitoring, wellhead protection, ground water allocation, well construction, wellfield design, facility siting, permitting, application of agricultural best management practices, remediation, and management of ground water dependent surface water features (springs, fens, lakes, rivers).

C. Other Funds Proposed to be Spent during the Project Period:

M.L. 2008

The USGS STATEMAP Program has granted MGS \$175,000 toward completion of the surficial geologic map of Sibley County and the bedrock geologic maps of Nicollet and Sibley counties. These grants were leveraged by using the LCCMR grant as a match.

M.L. 2008

Proposals will be made for similar matches to selected products of the 2009 appropriation.

D. Spending History: LCMR provided funds for the Mankato State University, Water Resource Center to create and publish geologic atlases in the project area covered by the 2008 work plan.

VII. DISSEMINATION:

Geologic maps and databases prepared by the Minnesota Geological Survey will be available in GIS and other electronic formats on the MGS website, and in print.

VIII. REPORTING REQUIREMENTS:

Periodic work program progress reports will be submitted not later than 12/1/08, 7/1/09, 12/1/09, 7/1/10, 12/1/10, 6/30/11, 12/1/11, 6/30/12 A final work program report and associated products will be submitted between June 30 and August 1, 2009 and again between June 30 and August 1, 2010 as requested by the LCCMR

IX. RESEARCH PROJECTS:

Attachment A: Budget Detail for 2008 Projects -								
Project Title: South-Central Minnesota County Geological Atlases								
Project Manager Name: Dale Setterholm, MGS								
Trust Fund Appropriation: \$ 706,000								
2008 Trust Fund Budget	<u>Result 3 (MGS)</u> <u>Budget:</u>	Amount Spent (5/14/09)	Balance (5/14/09)	<u>Result 4 (MGS)</u> <u>Budget:</u>	Amount Spent (5/14/09)	Balance (5/14/09)	TOTAL BUDGET	TOTAL BALANCE
	<i>Part A County Geologic Atlases: Blue Earth, Nicollet, and Le Sueur Counties</i>			<i>MGS support for DNR Drilling</i>				
BUDGET ITEM			0			0		
PERSONNEL: wages and benefits	\$440,450	\$49,766	\$439,880	\$69,962	\$3,173	\$66,789	\$510,412	\$506,669
Contracts							\$0	\$0
Other contracts <i>rotosonic drilling (Result 3)</i>	\$125,000	\$0	\$125,000	\$0		\$0	\$125,000	\$125,000
Printing	\$0		\$0	\$0		\$0	\$0	\$0
Other Supplies <i>(list specific categories)</i>	\$12,750	\$623	\$12,127	\$5,310		\$5,310	\$18,060	\$17,437
Travel expenses in Minnesota	\$52,000	\$2,410	\$49,590	\$528	\$778	-\$250	\$52,528	\$49,340
COLUMN TOTAL	\$630,200	\$52,799	\$577,401	\$75,800	\$3,951	\$71,849	\$706,000	\$649,250

Attachment A: Budget Detail for 2009 Projects -								
Project Title: County Geologic Atlas Acceleration								
Project Manager Name: Dale Setterholm								
Trust Fund Appropriation: \$ 820,200								
1) See list of non-eligible expenses, do not include any of these items in your budget sheet								
2) Remove any budget item lines not applicable								
2009 Trust Fund Budget	Result 3B Budget:	Amount Spent (date)	Balance (date)	Result 5 Budget:	Amount Spent (date)	Balance (date)	TOTAL BUDGET	TOTAL BALANCE
	Fill in your result title here.			Fill in your result title here.				
BUDGET ITEM	Initiate new CGAs in Anoka and Wright counties			Production and Printing of Benton and Chisago CGAs				
PERSONNEL: wages and benefits (List individual names, amount budgeted and %FTE; add rows as needed)	532,000	0	532,000	37,200	0	37,200	569,200	569,200
Contracts						0		0
Professional/technical (test drilling, bid)	75,000	0	75,000		0	0	75,000	75,000
Other direct operating costs (repair flowmeter)	9,000	0	9,000		0	0	9,000	9,000
Non-capital Equipment / Tools (what equipment? Give a general description and cost)		0	0		0	0		0
Capital equipment over \$3,500 (Giddings soil probe, truck, borehole camera)	77,000	0	77,000		0	0	77,000	77,000
Printing (competitive bid)			0	22,000	0	22,000	22,000	22,000
Supplies (list specific categories)	13,000		13,000		0	0	13,000	13,000
Travel expenses in Minnesota	55,000		55,000		0	0	55,000	55,000
Other (Describe the activity and cost) be specific								
COLUMN TOTAL	\$761,000	\$0	\$761,000	\$59,200	\$0	\$59,200	\$820,200	\$820,200