2011 Project Abstract
For the Period Ending June 30, 2014

Project Title: *Conservation Based Approach for Assessing Public Drainage Benefits*
Project Manager: Tim Gillette
Affiliation: Board of Water and Soil Resources
Address: 520 lafayette RD
City: St Paul **State:** MN **Zipcode:** 55155
Telephone Number: 651-297-8287
Email Address: tim.gillette@state.mn.us
Web Address: http://www.bwsr.state.mn.us
Funding Source: Environment and Natural Resources Trust Fund
Legal Citation: M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 03m
Appropriation Amount: $150,000

Overall Project Outcome and Results

Agricultural drainage provides an essential service to farmers and producers across the Midwest. However, maintenance and improvements of the drainage system are very costly. Landowners are charged via taxation based on the amount of benefits they receive from the drainage system. Currently in Minnesota benefits are determined by professional ditch viewers. Little guidance is provided to them by the drainage code and the process is highly laborious. Benefits are currently assigned per parcel based on discrete benefit classes. Professional judgment is an inherent component of the assessment. The main focus of this project is to investigate potential methods to improve on the current practices. The project was particularly interested in exploring the usefulness of geographic and hydrologic modeling software to automate the process, to objectively identify benefits, and to incorporate conservation practices in assessments.

Instead of using the current Minnesota method of discrete benefit classes, the project proposed a new method called the UM method based on drainage volume for each parcel. The UM method does not use professional judgment to assign benefit classes. The method does, however, require an estimate of the surface and subsurface drainage volume for each parcel.

Applying these alternative methodologies prior to manual, in field assessments will likely save time and money in the assessment process. Knowledge of the corresponding reductions in drainage depth volume and fraction of benefits per parcel can be utilized as part of the decision making process of applying conservation drainage practices within a watershed.

The product of the project was a report, **Conservation Based Approach for Assessing Public Drainage Benefits: Final Project Report.** It delineates methodologies used, obstacles overcome, and the basis for recommendations.

Project Results Use and Dissemination

At present the information derived from this project will be used for decision making concerning potential future investigation into establishing of viewing practices outlined in the project report. This project was presented to the stakeholder Drainage Work Group (the

instigator of the project) once to update the Work Group on its progress, and a second time to make the Work Group aware of the recommendations. No action has been taken by the Drainage Work Group in regard to the recommendations coming from this project.

Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2011 Work Plan - Final Report

Date of Status Update: 8/2014

Date of Next Status Update: -------

Date of Work Plan Approval: 6/2011

Project Completion Date: 6/30/2014

Is this an amendment request? No

Project Title: Conservation Based Approach for Assessing Public Drainage Benefits

Project Manager: Tim Gillette

Affiliation: Board of Water and Soil Resources

Address: 520 lafayette RD

City: St Paulr **State:** MN **Zipcode:** 55155

Telephone Number: 651-297-8287

Email Address: tim.gillette@state.mn.us

Web Address: http://www.bwsr.state.mn.us

Location:

Counties Impacted: Statewide where M.S. Chapter 103E drainage systems are located

Ecological Section Impacted: Lake Agassiz Aspen Parklands (223N), Minnesota and Northeast Iowa Morainal (222M), North Central Glaciated Plains (251B), Northern Minnesota and Ontario Peatlands (212M), Northern Minnesota Drift and lake Plains (212N), Northern Superior Uplands (212L), Paleozoic Plateau (222L), Red River Valley (251A), Southern Superior Uplands (212J), Western Superior Uplands (212K)

Total ENRTF Project Budget:		
	ENRTF Appropriation $:	150,000.00
	Amount Spent $:	150,000.00
	Balance $:	0.00

Legal Citation: M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 03m

Appropriation Language:
$75,000 the first year and $75,000 the second year are from the trust fund to the Board of Water and Soil Resources to develop an alternative framework to assess drainage benefits on public systems to enhance water conservation. This appropriation is available until June 30, 2014, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Conservation Based Approach for Assessing Public Drainage Benefits

II. PROJECT SUMMARY:

Agricultural drainage provides an essential service to farmers and producers across the Midwest. However, maintenance and improvements of the drainage system are very costly. Landowners are charged via taxation based on the amount of benefits they receive from the drainage system. Currently in Minnesota benefits are determined by professional ditch viewers. Little guidance is provided to them by the drainage code and the process is highly laborious. Benefits are currently assigned per parcel based on discrete benefit classes. Professional judgment is an inherent component of the assessment. The main focus of this project is to investigate potential methods to improve on the current practices. The project was particularly interested in exploring the usefulness of geographic and hydrologic modeling software to automate the process, to objectively identify benefits, and to incorporate conservation practices in assessments.

Instead of using the current Minnesota method of discrete benefit classes, the project proposed a new method called the UM method based on drainage volume for each parcel. The UM method does not use professional judgment to assign benefit classes. The method does, however, require an estimate of the surface and subsurface drainage volume for each parcel.

Applying these alternative methodologies prior to manual, in field assessments will likely save time and money in the assessment process. Knowledge of the corresponding reductions in drainage depth volume and fraction of benefits per parcel can be utilized as part of the decision making process of applying conservation drainage practices within a watershed.

The product of the project was a report, Conservation Based Approach for Assessing Public Drainage Benefits: Final Project Report. It delineates methodologies used, obstacles overcome, and the basis for recommendations.

III. PROJECT STATUS UPDATES:

Project Status as of January 2012:
Project start-up and progress was slowed by vacant BWSR Conservation Drainage Engineer position (new project manager) for which Kyle Skov was hired starting January 3, 2012. Limited coordination with University of Minnesota in summer / fall 2011 regarding project and Activity 1 inventory of potential runoff based assessment methods. Anticipate substantial acceleration of project activities during current work period. Requested amendment of project manager, Activity 1 completion dates and addition of January 2014 project status report.

Project Status as of July 2012:
The BWSR staff member who was the project manager for this project left at the end of July. The July 2012 reporting was not done on time. A staff member was hired by BWSR and became the active project manager of this project in the late fall of 2012.

The present update covers the first six months of the CY 2012.
A project timeline extension requested in the January 2012 update was granted by the LCCMR Project Manager in an email dated February 6, 2012.

Activity 1 Interim Report/LCCMR Activity 1 Final Report was completed in draft form

Project Status as of January 2013:

The BWSR staff member who was the project manager for this project left at the end of July. The July 2012 reporting was not done on time. A staff member was hired by BWSR and became the active project manager of this project in the late fall of 2012.

Activity 1 - Work continued on the Interim Report/LCCMR Activity 1 Final Report.

Activity 2 – Work intensified on creating a methodology for assessing benefits on the basis of runoff.

Project Status as of July 2013:

The project has picked up the pace.

Activity 1 – The final elements Outcomes 1 and 2 of this activity were completed in this reporting period. The Interim report got some needed additions and the Minnesota Drainage Work Group was updated.

Activity 2 – Outcome 1. Work continued on development of the technical framework for a runoff based assessment method.

The Project Manager met with the PI and his project coordinator on three occasions during the period to get updates on the progress of the project and to give guidance as to direction and timing.

Project Status as of January 2014:

Activity 1 – Completed the interim report ***Conservation Based Approach for Assessing Public Drainage Benefits*** due February 3, 2014.

Activity 2 – The key elements for this activity have been completed. The project has developed a (1) GIS tool to assign benefits that is based on current Minnesota methods and (2) an alternative method of assigning benefits using the drainage volume for parcel of lands. This method allows the impact of conservation practices to be incorporated into the assessment. Implementation of the alternative methods has been done using the SWAT model. Additional work with DRAINMOD has been to assess the impact of conservation practices. Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency are using GSSHA and HSPF models to assess drainage volumes.

Activity 3 – We have done preliminary comparisons of the benefit assessed by the alternative method to those established by the current Minnesota Method for the JD4 located in Martin County. We are refining the results of Activity 2 based on these results.

Final Project Status Update as of June 2014:
Activity 1 – No activities reported.

Activity 2 – Methodology of the technical framework was finalized. DRAINMOD was utilized to determine the reduction in water yield under shallow and controlled conservation practices. These reductions were applied in both SWAT and the economic analysis to determine the corresponding reduction in fraction of benefits on a quarter-quarter parcel basis by various levels of adoption. Additional statistical analyses where performed, including recursive binary partitioning to determine the importance of influential variables on benefit class determination and multinomial logit regression to determine class probabilities.

Activity 3 – The tasks described in Activity 2 were applied to the JD4 case study. The university hosted a meeting with DNR personnel to share their results in GSSHA and compare/present ours for SWAT. The final project report was organized, written and submitted to BWSR during the second week of April.

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Inventory runoff based assessment methods, prepare associated interim report, and coordinate.

Description: Conduct an inventory of how runoff based assessments or fees are prescribed and how assessments on public drainage systems are conducted in Minnesota, other states, and Canada. This inventory will be used to identify strengths and weaknesses in current methods that could be adapted for Minnesota. Results will be presented and discussed with the stakeholder Drainage Work Group.

Summary Budget Information for Activity 1:

ENRTF Budget: $ 6,000.00
Amount Spent: $ 6,000.00
Balance: $ 0.00

Activity Completion Date:

Outcome	Completion Date	Budget
1. Interim report – Inventory of Runoff Contribution Based and Public Drainage System Assessment Methods.	January 31, 2013	$ 5,500
2. Presentation and discussion with stakeholder Drainage Work Group.	February 28, 2013	$ 500

Activity Status as of January 2012:
Activity delayed by vacant BWSR position to serve as new project manager, which was filled starting January 3, 2012. Work to be accelerated during current work period.

Activity Status as of July 2012:
The BWSR staff member who was the project manager for this project left at the end of July. The July 2012 reporting was not done on time. A staff member was hired by BWSR and became the active project manager of this project in the late fall of 2012.

The present update covers the first six months of the CY 2012.
Principal Investigator:
Advise and supervise Graduate Student in his activities, attend meeting to discuss the project with team members and other stakeholders, recruit graduate students and outline their responsibilities to achieve the goals of the project

Graduate Student:
Planning work to determine how well other benefits assessment methods (i.e. those from Ohio and Bengtson et al.) correlated to the current methodology being used in Minnesota (i.e. how well other models fit our assumed correct model). This may provide insight into effective ways to simplify the current methodology used in Minnesota while maintaining a high level of fairness and accuracy. (January to June 2012)

In partial fulfillment of the Activity 1 workplan, a draft interim report - ***Conservation Based Approach for Assessing Public Drainage Benefits*** was delivered.

Activity Status as of January 2013:

Principal Investigator
Advise and supervise Graduate student in his activities, attend meeting to discuss the project with team members and other stakeholders, recruit graduate students and outline their responsibilities to achieve the goals of the project, and develop an alternative general framework for assigning benefits of drainage based on the drainage depth for the land parcels.

Graduate Student
Continued work on interim report ***- Conservation Based Approach for Assessing Public Drainage Benefits***.

Activity Status as of July 2013:

Completed the interim report ***Conservation Based Approach for Assessing Public Drainage Benefits*** and presented findings to the Drainage Work Group on April 5, 2013 for discussion and comments.

Activity Status as of January 2014:

We completed the interim report ***Conservation Based Approach for Assessing Public Drainage Benefits*** due February 3, 2014.

Final Report Summary:
No activities reported.

ACTIVITY 2: Develop technical framework for runoff based assessment method, prepare associated interim report, and coordinate.

Description: An alternative method for public drainage system assessment will be developed in this task by the University of Minnesota. The methodology is anticipated to be an innovative GIS tool based on land use, soils, LiDAR based topography and position in the watershed (terrain analysis) to determine relative runoff contribution to a drainage system on a parcel basis. The project team will periodically coordinate with the stakeholder Drainage Work Group, including one or more public drainage system viewers, during the development of the technical framework for a runoff based assessment method. The project team will also coordinate and receive input from state agencies having expertise and knowledge in drainage via the interagency Drainage Management Team (BWSR, MDA, DNR, MPCA, NRCS, UMN, MSU-Mankato).

Summary Budget Information for Activity 2:

ENRTF Budget:	**$ 129,000.00**
Amount Spent:	**$ 129,000.00**
Balance:	**$ 0.00**

Activity Completion Date:

Outcome	Completion Date	Budget
1. Development of technical framework for runoff based assessment method.	March 1, 2013	$120,000
2. Periodic coordination with stakeholder Drainage Work Group.	June 15, 2013	$2,000
3. Interim report – Runoff Contribution Based Approach for Public Drainage System Assessments.	May 1, 2013	$7,000

Activity Status as of July 2012**:**

The BWSR staff member who was the project manager for this project left at the end of July. The July 2012 reporting was not done on time. A staff member was hired by BWSR and became the active project manager of this project in the late fall of 2012.

Principal Investigator:

Advise and supervise Graduate Student in his activities attend meeting to discuss the project with team members and other stakeholders, recruit graduate students and outline their responsibilities to achieve the goals of the project, develop an alternative general framework for assigning benefits of drainage based on the drainage depth for the land parcels.

Activity Status as of January 2013**:**
Principal Investigator
Advise and supervise Graduate student in his activities, attend meeting to discuss the project with team members and other stakeholders, recruit graduate students and outline their responsibilities to achieve the goals of the project, and develop an alternative general framework for assigning benefits of drainage based on the drainage depth for the land parcels.

Graduate Student
1. Review of Minnesota drainage law (103E) and other related documents to develop an understanding of drainage district organization, proceedings, projects, and other relevant issues. (July 2012)

2. Worked with Ron Ringquist (meeting in Redwood Falls last summer, many phone conversations, 2 days spent in Blue Earth County with Ron and 2 other viewers doing a redetermination of benefits) to improve understanding of ditch viewing techniques in Minnesota (August 2012 to present)

3. Attended Minnesota Viewers Association (MVA) meetings (Willmar in October and the MAWD Conference in Alexandria in November) to gain first hand knowledge of MVA practice and training methods (October - November 2012)

4. Review of drainage law and other relevant documents from Illinois, Indiana, Iowa, Ohio, North Dakota, and Ontario to gain an understanding of how drainage districts are organized and how benefits are determined in other jurisdictions (final version of lit review report to be delivered very soon) (July 2012; November 2012 to present for Ohio)

5. Began work to replicate ditch viewing procedure used to redetermine benefits for JD4 (Martin/Watonwan Counties) in 2011, to improve working knowledge of how the steps of the viewing process culminate to produce a final product. (October 2012 to present)

6. Planning work to determine how well other benefits assessment methods (i.e. those from Ohio and Bengtson et al.) correlated to the current methodology being used in Minnesota (i.e. how well other models fit our assumed correct model). This may provide insight into effective ways to simplify the current methodology used in Minnesota while maintaining a high level of fairness and accuracy. (January 2012 to present)

Activity Status as of July 2013**:**

1. Further time spent with Ron Ringquist and other ditch viewers to fully understand current Minnesota viewing practices in order to understand how changes may be made to drainage law
2. Developed a methodology for predicting land benefit classes (A, B, C, and D) from relevant factors (land capability class, soil type, elevation, etc.) currently used to determined benefit classes in Minnesota to save time in performing redeterminations of benefits
3. Replicated JD4 2011 redetermination of benefits as a GIS map layer to understand the underlying factors (terrain, hydrologic, land use, etc.) that fundamentally underlie benefits determinations in Minnesota
4. Redetermined the benefits for JD4 using various Ohio benefit determination methods to understand how the factors affecting those methods compare to current viewing practices in Minnesota
5. Developed a theoretical framework to assign drainage benefits based on runoff contribution for numerous typical landscape and soil situations in Minnesota

a. Began work to quantify surface and subsurface runoff contribution with the SWAT model
b. Began work to quantify subsurface drainage runoff contribution with the DRAINMOD model for typical conventional drainage. Future work will include the possibility of exploring drainage runoff contribution for the following cases:
    i. Reduced intensity drainage (shallower drain tile, increased tile spacing)
    ii. Controlled drainage
    iii. Cover crops
    iv. Perennial/forage crops or native grasses

6. Continued analysis of the applicability of benefits determination methods from other jurisdictions to possible change in Minnesota Drainage Law
7. Continued GIS incorporation in ongoing work to work toward the eventual potential goal of incorporating GIS into ditch viewing and record keeping

Activity Status as of January 2014**:**

The key elements for this activity have been completed. The project has developed a (1) GIS tool to assign benefits that is based on current Minnesota methods and (2) an alternative method of assigning benefits using the drainage volume for parcel of lands. This method allows the impact of conservation practices to be incorporated into the assessment. Implementation of the alternative methods has been done using the SWAT model. Additional work with DRAINMOD has been to assess the impact of conservation practices. Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency are using GSSHA and HSPF models to assess drainage volumes. We completed the interim report ***Conservation Based Approach for Assessing Public Drainage Benefits*** due February 3, 2014.

Final Report Summary:
Methodology of the technical framework was finalized. DRAINMOD was utilized to determine the reduction in water yield under shallow and controlled conservation practices. These reductions were applied in both SWAT and the economic analysis to determine the corresponding reduction in fraction of benefits on a quarter-quarter parcel basis by various levels of adoption. Additional statistical analyses where performed, including recursive binary partitioning to determine the importance of influential variables on benefit class determination and multinomial logit regression to determine class probabilities.

ACTIVITY 3: Test the framework method on a case study drainage system and present project results.

Description: Using the framework method developed in Activity 2, a case study will be developed for an example drainage system showing how the methodology might be implemented. The case study will test three scenarios: existing conditions and two levels of conservation practice adoption to demonstrate the effect of voluntary conservation practice adoption on drainage system assessment rates on a parcel basis and the effect of these two different practice adoption scenarios on drainage system water yield.

Summary Budget Information for Activity 3:

ENRTF Budget:	**$ 15,000.00**
Amount Spent:	**$ 15,000.00**
Balance:	**$ 0.00**

Activity Completion Date:

Outcome	Completion Date	Budget
1. Evaluation of case study scenarios.	August 31, 2013	$10,500
2. Final report documenting the project, including the case study scenarios.	October 15, 2013	$3,000

3. Presentation of the study at appropriate venue(s) (e.g. Annual UMN Water Resources Conference, MAWD Annual Meeting, and/or AMC Annual Conference).	December 15, 2013	$1,500

Activity Status as of January 2013: No activity to report.

Activity Status as of July 2013**:** No activity to report.

Activity Status as of January 2014: We have done preliminary comparisons of the benefit assessed by the alternative method to those established by the current Minnesota Method for the JD4 located in Martin County. Dr. Gary Sands presented at the tri-state 2013 Drainage Research Forum in South Dakota on November 14th. His presentation outlined the research being done in relation to this project which was titled "Reassignment of Benefits in Minnesota." The current interim report will form the basis of the final project report.

Final Report Summary:
The tasks described in Activity 2 were applied to the JD4 case study. The final report was organized, written and submitted to BWSR during the second week of April. The university hosted a meeting with DNR personnel to share their results in GSSHA and compare/present ours for SWAT.

V. DISSEMINATION:

Description: During the course of the project, periodic coordination will occur with the stakeholder Drainage Work Group, which includes representatives of more than 20 drainage stakeholder organizations and agencies, as well as with the interagency Drainage Management Team, which includes agency and university representatives. This coordination will involve dissemination and discussion of information gathered and developed to date for the project. Near the end of the project, results of the project will be presented at one or more appropriate venues that Chapter 103E drainage authorities, their technical advisors and other drainage stakeholders are likely to attend, such as the Annual UMN Water Resources Conference, MAWD Annual Meeting, and/or AMC Annual Conference. The project final report will be posted on the drainage page of the BWSR website at: http://www.bwsr.state.mn.us/drainage/index.html.

Status as of January 2012: Activity delayed by vacant BWSR position to serve as new project manager, which was filled starting January 3, 2012. Work to be accelerated during current work period.

Status as of July 2012**:** The BWSR staff member who was the project manager for this project left at the end of July. The July 2012 reporting was not done on time. A staff member was hired by BWSR and became the active project manager of this project in the late fall of 2012.

No dissemination occurred to stakeholders within the period.

Status as of January 2013**:** No activity to report.

Status as of July 2013**:** Coordination with the Drainage Work Group in April 2013 by presenting and discussing the findings of the report ***Conservation Based Approach for Assessing Public Drainage Benefits***.

Status as of January 2014:

Final Report Summary:
At present the information derived from this project will be used for decision making concerning potential future investigation into establishing of viewing practices outlined in the project report. This

project was presented to the stakeholder Drainage Work Group (the instigator of the project) once to update the Work Group on its progress, and a second time to make the Work Group aware of the recommendations. No action has been taken by the Drainage Work Group in regard to the recommendations coming from this project.

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget:

Budget Category	$ Amount	Explanation
Personnel:		
Professional/Technical Contracts:	$149,145	Contract with University of Minnesota for 1 research associate (RA) and 1 graduate research assistant (GRA) at approximately 0.4 FTE ($72,000) and 0.7 FTE ($77,000) to perform project investigation, development, reporting and presentation work under the in-kind supervision of Prof. Dr. Bruce Wilson and Assoc. Prof. Dr. Gary Sands.
Travel Expenses in MN:	$ 855	Coordination meetings with stakeholder Drainage Work Group and interagency Drainage Management Team, field work, and project presentations at appropriate venues for dissemination. For UMN RA and GRA.
TOTAL ENRTF BUDGET:	**$150,000**	

Explanation of Use of Classified Staff: N/A

Explanation of Capital Expenditures Greater Than $3,500: N/A
Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation: 1.1 FTEs (over approximately 2 to 2.5 years)

B. Other Funds: (No other cash. In-kind funds below.)

Source of Funds	$ Amount Proposed	$ Amount Spent	Use of Other Funds
Non-state			
UMN	$22,000	$ 23,600	In-kind technical and graduate student supervision support by Prof. Dr. Bruce Wilson and Assoc. Prof. Dr. Gary Sands
State			
BWSR, DNR, MPCA	$28,000	$ 26,411	In-kind project management by Conservation Drainage Engineer and Al Kean, BWSR, and technical and review support by Jim Solstad, DNR ($4,000) and Chuck Regan, MPCA ($4,000).
TOTAL OTHER FUNDS:	$50,000	$ 50,011	

VII. PROJECT Partners: STRATEGY:

A. Project Partners:

Tim Gillette, Conservation Drainage Engineer, Board of Water and Soil Resources (project manager, providing project coordination and management and connection to interagency Drainage Management Team)

Al Kean, Chief Engineer, Board of Water and Soil Resources (providing in-kind project management support and connection to the stakeholder Drainage Work Group and interagency Drainage Management Team)

Dr. Bruce Wilson, Professor, Department of Biosystems and Bioproducts Engineering, University of Minnesota (providing in-kind technical support and management of graduate student(s))

Dr. Gary Sands, Associate Professor, Department of Biosystems and Bioproducts Engineering, University of Minnesota (providing in-kind technical support and management of graduate student(s))

Greg Eggers, Drainage Engineer, Minnesota Department of Natural Resources (interagency Drainage Management Team member providing in-kind technical support and review)

Jim Solstad, Senior Hydrologist, Minnesota Department of Natural Resources (interagency Drainage Management Team member providing in-kind technical support and review)

Chuck Regan, Technical Assistance, Minnesota Pollution Control Agency (providing in-kind technical support and review)

(None of the above paid by ENRTF)

Research associate and graduate research assistant, University of Minnesota ($150,000) (paid via ENRTF)

B. Project Impact and Long-term Strategy: The current method in Chapter 103E drainage law for assessment of public drainage system costs is based on highest and best use of benfitted lands with full potential drainage. The current assessment approach does not provide incentive for limiting or reducing runoff from land. This project will investigate and develop a technical framework for a runoff based method to assess drainage system costs, which could provide incentive for limiting or reducing runoff from benefitted lands (Phase 1). It is envisioned that a Phase 2 could involve identification of Chapter 103E drainage system(s) to implement this assessment method on a pilot basis, with associated information dissemination to drainage stakeholders about the results of the pilot.

C. Spending History: None prior to July 1, 2011.

Funding Source	**M.L. 2011 or FY 2012**
ENRTF M.L. 2011 1st Special Session, Chapter 2, S.F. No. 3, Art. 3, Sec. 2, Subd. 3(m)	$75,000 FY12 $75,000 FY13

VIII. ACQUISITION/RESTORATION LIST: N/A

IX. MAP(S): N/A

X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted not later than January 2012, July 2012, January 2013 and July 2013, January 2014. A final report and associated products will be submitted not later than between June 30 and August 15, 2014 as requested by the LCCMR.

Attachment A: Budget Detail for M.L. 2011 (FY 2012-13) Environment and Natural Resources Trust Fund Projects

Project Title: Conservation-Based Approach for Assessing Public Drainage Benefits
Legal Citation:
Project Manager: Tim Gillette, Conservation Drainage Engineer, BWSR
M.L. 2011 (FY 2012-13) ENRTF Appropriation: $150,000
Project Length and Completion Date: June 30, 2014
Date of Final Report: August 14, 2014

All the grant monies were spent, but the end balances in the two categories are not on budget. This discrepancy was found after the end date of the grant when the final invoice was received from the UMN. In conversation with LCCMR staff the normal way to deal with this situation would have been to do a worplan change. However, due to the timing of the discovery of the below budget use of transportation funds, it was decided to use faculty and graduate student hours (that had been worked but were over budget) to use the remaining grant funds.

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Balance	Activity 2 Budget	Amount Spent	Balance	Activity 3 Budget	Amount Spent	Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	***Inventory runoff based assessment methods, prepare associated interim report, and coordinate.***			***Develop technical framework for runoff based assessment method, prepare associated interim report, and coordinate.***			**Test the framework method on a case study drainage system and present project results.**				
Professional/Technical Contracts Contract with University of Minnesota for 1 research associate (RA) and 1 graduate research assistant (GRA) at approx. 0.4 FTE ($72,000) and 0.7 FTE ($77,000) to perform project investigation, development, reporting and presentation work under the in-kind supervision of Prof. Dr. Bruce Wilson and Assoc. Prof. Dr. Gary Sands.	6,000	6,000	0	129,000	129,000	0	14,000	14,145	-145	149,000	**-$145**
Travel expenses in Minnesota Mileage, lodging, meals for meetings, presentations and field work by UMN RA and/or GRA. ($0.50/mi. or UMN plan)							1,000	855	145	1,000	145
COLUMN TOTAL	**$6,000**	**$6,000**	**$0**	**$129,000**	**$129,000**	**$0**	**$15,000**	**$15,000**	**$0**	**$150,000**	**$0**