Project Management Plan

Minnesota River Basin
Specifically Authorized Feasibility Study

Revised April 15, 2008

1. Purpose.
a. The purpose of this project management plan (PMP) is to define the scope, planning approach, roles and responsibilities, products, schedule and budget for an integrated study of the Minnesota River Basin (MRB). The objective of the study will be to prepare a plan for watershed and water quality management and aquatic ecosystem restoration in the MRB. This document also establishes quality control expectations and procedures to ensure that the study products meet sponsor needs and applicable standards.

b. This PMP will be the working document that will be used to determine the path forward for the project. the PMP will indicate what tasks will be completed by the U.S. Army Corps of Engineers (Corps) and the non-federal Sponsor.

c. This PMP defines the activities to be accomplished, products to be developed, schedule, and associated costs that the Federal Government, the non-federal Sponsor, and other non-federal study partners will be supporting financially. The PMP, therefore, reflects a commitment on the part of all the financial backers, as well as those who will be performing the activities involved in the study.

d. The PMP is a basis for change. Because planning is an iterative process, more or less costs and time may be required to conduct the study. Changes in scope will occur as the technical picture unfolds. With clear descriptions of the tasks, roles and responsibilities outlined in the PMP, changes are easier to identify. The impact in either time or money is easily assessed and decisions can be made on how to proceed.

e. The PMP prescribes technical review and quality control for the watershed management plan. The PMP reflects mutual agreements between the Corps and the non-federal Sponsor on the scope, critical assumptions, methodologies, and level of detail for the studies that are to be conducted during development of the watershed management plan. Review of the draft report will be done to insure that the study has been developed consistent with these agreements.

f. The PMP is a study management tool. It is a scope of work that will be used for funds allocation by the Corps project manager. It forms the basis for identifying commitments to the non-Federal Sponsor and serves as a basis for performance measurement.

2. Applicability. This PMP covers development of a plan for watershed and water quality management and aquatic ecosystem restoration in the MRB.

3. References.
a. St. Paul District, U.S. Army Corps of Engineers 2004. Minnesota River Basin Reconnaissance Study. Section 905(b) Analysis (WRDA of 1986). Minnesota, South Dakota, North Dakota, and Iowa.

4. Background.

a. A study to develop a plan for watershed and water quality management and aquatic ecosystem restoration in the MRB was recommended in the Minnesota River Basin Reconnaissance Report (reference above). Congress authorized expenditure of funds on this study in the Consolidated Appropriations Act, 2008, approved 26 December 2007 (**Public Law 110-161**)

b. The Minnesota Environmental Quality Board is sponsoring this study. They are supported by the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Natural Resources (DNR), the Metropolitan Council of the Twin Cities Environmental Services (MCES), the Minnesota Department of Agriculture, Minnesota Board of Soil and Water Resources, the University of Minnesota, Mankato State University, and the MN River Board. The sponsor is required to sign the Feasibility Cost Sharing Agreement (FCSA) and provide 50% of all study costs through non-federal cash and in-kind contributions. The PMP defines the contributions expected from the Sponsor and the anticipated contributions of other funding partners toward the Sponsor's shares of the study costs. The Corps will fund the remaining 50% of study costs. The study will be accomplished as described below. No non-federal funds or in-kind services will be creditable until a FCSA is executed. Once the FCSA is in place the project will proceed with phase 1. This project and corresponding PMP are set up to be working documents. The Project Delivery Team (PDT) and the Executive Committee have the ability and authority to modify the project tasks, schedules, and costs at any time. Work should not be started until there is formal agreement from the PDT that the work is necessary and the costs are reasonable for the study. Requests should be directed to the Project Manager who will then coordinate with the remaining team members.

c. The study objective is to prepare a plan for watershed, aquatic ecosystem, and water quality management and restoration in the MRB. Identification of effective management and restoration actions will be assisted by a decision support system (DSS). The DSS will consist of a family of process-based simulation models, GIS, LiDAR, survey results, agricultural and ecological economics valuation models, plan formulation, alternatives analysis, and evaluation models. Because water flow is the central process, this modeling effort will emphasize the hydrology, water quantity, water quality, groundwater and other waterborne material mobilization, transport, and fate processes in the MRB.

The DSS will enable examination of existing conditions, forecasting of future conditions, and simulation of alternatives that will be ecologically sustaining and socially desired. The DSS will address watershed, water quality, water quantity, groundwater and ecosystem restoration needs at the small watershed, major watershed, tributary river, and main stem Minnesota River reach levels of spatial scale. The DSS will enable forecasting future conditions. The primary purpose of the DSS will be to assist in the selection, design, implementation, monitoring, and evaluation of watershed, water quality, water quantity, groundwater, and ecosystem management and restoration measures. The DSS will assist decision-makers and the public in identifying optimal investments and the long-term requirements to meet watershed, water quality, water quantity, groundwater, ecosystem, economic and societal planning objectives in the MRB.

d. Development of a watershed management plan for the MRB will be based on a standard planning process of assessing existing conditions, forecasting future conditions, and identifying desired future conditions based on planning objectives. The system needs will be identified through comparison between forecasted future conditions and desired future conditions. Simulations of different alternative management and restoration plans (combinations of measures) will be done using the DSS to evaluate effectiveness. Ecological and agricultural economics models will be used to identify optimal combinations of management and restoration measures to achieve planning objectives to approach sustainability of ecosystems and the agricultural economy. Results of this modeling and planning effort will be synthesized into a GIS-linked DSS that decision-makers can use to allocate investments in watershed and water quality management, and ecosystem restoration in the MRB. The watershed management plan will identify the most effective combination and sequence of management measures to attain the plan objectives.

5. Tasks

The following paragraphs describe a set of activities leading to development of a watershed and water quality management plan for the MRB. This set of activities is one possible way to prepare a plan for watershed and water quality management and ecosystem restoration in the MRB. It includes aggressive use of technologies and methodologies that are currently being developed. When the study starts the team will need to evaluate the current state of these technologies and methodologies versus the goals of the study. It may be decided to follow a more conventional approach, such as starting with a less detailed basin-wide model and only modeling in detail areas where management alternatives are being considered. The study team will also need to update the plan based on other studies that may have been completed or in progress at the time this study commences. At that time a detailed breakdown of responsibilities of the various partners needs to be determined. Proposed study team participants by agency, the estimated cost of the work by task, and the estimated amounts of Federal funding and non-Federal in-kind services work is shown in Table 1 attached. The tasks listed below will be completed in the order determined by the modeling technical committee.

a. Study Team

An interagency study team will be formed with expertise in hydrology, geomorphology, limnology, ecology, agriculture, economics, planning, and modeling. The non-Federal participants will be from the MPCA, the DNR, the Minnesota Board of Water and Soil Resources (BWSR), the MCES, Minnesota State University – Mankato, and the University of Minnesota. Federal participants will include the Corps, the Natural Resources Conservation Service (NRCS), the U.S. Fish and Wildlife Service (USFWS), the U.S. Geological Survey (USGS), and the U.S. Environmental Protection Agency (EPA).

U.S. Army Engineer Research and Development Center (ERDC) Environmental Laboratory scientists will actively participate in the Study Team in conjunction with the Corps System-Wide Water Resources Program (SWWRP) research and development program.

The Study Team will collaborate on the details of the modeling and DSS development. The non-Federal participants will be the lead people representing their respective agencies for non-Federal in-kind cost-share work. Subteams consisting of people with special expertise will be formed as needed to deal with process- and task-specific technical matters.

The study team will also be broken into a modeling technical committee which will meet early in the study process to determine the best way to proceed with the tasks listed below. One possible way forward would be to: 1. Assemble data from various federal, local and state agencies, universities; 2. Identify data collection needs (LiDAR, traditional stream cross section surveys, discharge, sediment, nutrient, precipitation, hydro meteorological parameters, soils, subsurface geology, water table, drain tile locations etc.); 3. Develop a basin-wide watershed model at a less detailed scale that would give an overall perspective and help target small watersheds for more detailed analysis; 4. Small watershed modeling where more detailed is warranted. Apply BMPs and evaluate effectiveness of BMP measures for small watersheds. Some of these items are described in more detail in the task list below.

b. Small Watershed Modeling

Spatially explicit, process-based hydraulic models using the Corps of Engineers Gridded Surface Subsurface Hydrologic Analysis (GSSHA) or comparable program will be developed for at least six selected smaller (~23,000-acre) watersheds. The watersheds will be selected to represent geomorphically different parts of the MRB, and for availability of environmental data needed for modeling. The models will simulate surface and groundwater flow and subsurface drainage. The small watershed models will be calibrated using contemporary monitoring data. Stakeholders at all levels will assist in selecting the representative small watersheds to model and to provide the full set of available environmental data needed for the modeling work. The University of Minnesota, the MCES, and the MPCA will work closely with the Corps in providing input on physical processes for the modeling effort and in conducting monitoring needed to provide data for model calibration.

The models will be used to generate a set of annual hydrographs, representing existing conditions in typical dry, normal, and wet years, selected from the hydrologic record. Soil and Water Assessment Tool (SWAT) models of urban sub-watersheds provided by the Metropolitan Council Environmental Services will be incorporated into the small watershed modeling effort.

c. Simulate Existing Materials Transport Processes

The models will be adapted and linked to process-based models of sediment erosion, nitrogen (N) and phosphorus (P) mobilization, and transport. The GSSHA models will be used to simulate annual loading rates of TSS, total nitrogen (TN), and total phosphorus (TP) under existing conditions.

d. Simulate the Natural Hydrologic Regime

The models will be modified to simulate a set of natural (without agricultural drainage, storm water systems, road ditches, dams, with prairie vegetation, etc.) hydrographs for typical dry, normal, and wet years.

e. Simulate Natural Materials Transport Processes

The models will be adapted and linked to process-based models of sediment erosion, N and P mobilization, and transport for natural conditions (prairie vegetation, no agriculture, no artificial drainage system, etc.). The models will be used to simulate annual loading rates of TSS, TN, and TP.

f. Assess the Effects of Hydrologic Alteration and Land Use

The models adapted to simulate natural conditions will be used to generate a synthetic hydrograph for a selected recent (e.g., 30-year) period of record. The simulated annual hydrographs will be examined and compared to the historic record using selected indicators of hydrologic alteration (Richter et al. 1996) for selected locations in the MRB. Simulated annual yield curves of sediment, N, and P for existing and natural conditions at selected locations will be compared.

g. Scaling to Major Watersheds

Hydrologic characteristics of the smaller watersheds will be selected for scaling to the major watersheds in the MRB. The models of a selected set of four to six major MRB watersheds will be developed at lower levels of spatial resolution. The major watershed models will incorporate the available Hydrologic Simulation Program Fortran (HSPF) models to simulate TSS, N, and P loadings to the Minnesota River. The annual hydrographs and loading rate curves will be simulated for existing conditions using the same set of typical dry, normal, and wet hydrologic conditions.

h. Simulate Minnesota River Water Quality

Output from the major watershed models and a numerical hydraulic river flow model (HEC-RAS) will be used as input to CEQUAL-W2 river and reservoir water quality models. The main stem Minnesota River model system will extend from Big Stone Lake to the confluence with the Mississippi River. The focus of attention will be on but not limited to Big Stone Lake, Marsh Lake, Lac qui Parle, and the lower Minnesota River from Shakopee to the Mississippi River. If it is determined necessary additional areas will be considered such as more of the main stem of the Minnesota River along with other tributaries of the Minnesota River. The annual progression of existing conditions (TSS, Secchi transparency, N, P, Chlorophyll a, Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO)) will be simulated for typical dry, normal, and wet hydrologic conditions.

For the lower Minnesota River, a model system incorporating NAVEFF and NAVSED (hydraulic effects of commercial navigation traffic) models will be used to simulate the effects of commercial navigation traffic on water quality in the lower Minnesota River.

i. Simulate Future Conditions

The study team will make and define a series of assumptions about future land use, urban development, climate, geomorphic processes, the agricultural drainage system, and watershed management in the MRB. These assumptions will be used as input variables in the model system to simulate future (some specified year, e.g., 2025) conditions. The small watershed, large watershed, and river water quality model systems will be used to simulate future (without projects or change in management) conditions of system hydrology, loading rates, and Minnesota River water quality conditions. These simulations will be used to generate a description of future conditions for typical dry, normal, and wet hydrologic conditions.

j. Identify Ecologically Realistic Target Future Conditions; Identify System Needs

The Study Team will examine the simulated future conditions, consider goals for watershed and water quality conditions, and develop a set of target future conditions. The Team will identify system needs (e.g., changes in the hydrologic regime, wetland, lake, reservoir and river restoration, sediment and nutrient loading rates, and river water quality conditions) that will be required to meet the target future conditions.

k. Select Management Measures to Simulate

The Study Team will identify a set of best management practices for watershed management, land cover changes, modifications to the agricultural drainage system, wetland restorations, tributary channel restoration, reservoir water level management, navigation traffic restrictions, and other measures appropriate to the MRB.

l. Simulate Effects of Management Measures Applied at Different Spatial Scales

The Study Team will simulate the effects of watershed and tributary river management actions in the six selected small-scale watersheds using GSSHA or a comparable model and the linked sediment and nutrient transport models. Rules for the spatial effects by number, geographic location, and area (as appropriate) of application of the management measures on the annual hydrograph and nutrient and sediment yield curves will be developed. Using the larger watershed and the river and reservoir water quality models, effects of combinations of management actions on conditions in the Minnesota River will be simulated.

m. Simulate Economic Effects of Management Actions

The Study Team will select appropriate modeling approaches to simulate the effects of management measures on the economy. Effects of management measures on crop acreages, alternative crops, crop yields, and agricultural income will be simulated. Economic effects of applying urban best management practices will also be assessed. Rules for the spatial effects by number, geographic location, and area (as appropriate) of application of the management measures on the local, regional, and national economy will be developed.

n. Simulate Ecological Benefits of Management Actions

The Study Team will select a set of ecosystem services that will be affected by watershed management, aquatic ecosystem, and water quality restoration. The model system will be used to simulate the effects of management measures on the production of ecosystem services. Rules for the spatial effects by number, geographic location, and area (as appropriate) of application of management measures on the production of ecosystem services will be developed. Monetary valuation of selected ecosystem goods and services will be estimated by applying accepted valuation methodologies and information from ecological economics literature sources.

o. Develop a Decision Support System

A decision support system (DSS) will be developed, using the results of the MRB model system and other existing watershed DSSs to enable decision-making about investments in watershed management, aquatic ecosystem restoration, water quality, water quantity, and groundwater management measures in the MRB. The DSS will be explicitly designed to meet sponsor needs. The DSS will be linked to the Basin GIS to enable visualization of the spatial arrangement of management measures. The DSS will incorporate incremental analysis techniques to identify the best value sequence of management measures to apply within each major watershed to achieve target future conditions. The DSS will be designed to simulate the costs and benefits (net increase in ecosystem services, net increase in farm income, increased social and human capital of rural communities) of alternative plan combinations.

p. Deliver DSS, Technology Transfer

The DSS will be made available to planners, resource managers, and decision-makers throughout the MRB via the Internet. The MRB watershed management and ecosystem restoration Internet site will include findings of the study, a synthesis of the modeling results, instructions for use of the DSS, and the Watershed Management Plan. The Internet site will be designed to enable tracking implementation of management and restoration measures and system response as revealed by monitoring.

q. Watershed Management Plan

The Watershed Management Plan will document the planning process and development of the DSS. The DSS will be used to identify the combination of management measures needed to attain the planning objectives. The type, geographic distribution, estimated cost, sequence of implementation, and

implementing agency for the management measures will be described in the Watershed Management Plan for the MRB.

r. LiDAR and Survey Collections

The project will incorporate all available information into the DSS using GIS. This includes the acquisition of LiDAR for the entire Minnesota River Basin, approximately 16,770 square miles. The LiDAR specifications will be developed by the team but will at a minimum meet FEMA standards. This optional phase of the study would optimally be collected during the beginning of the project as to enhance the ability of the models to better predict historic and existing conditions. Any data collected as part of this phase would be freely distributed to the public at no cost.

Survey collections will be conducted on an as needed basis to fill in current gaps or to enhance the modeling efforts. These collections will take place at the recommendation of the study team or a technical committee.

s. Implementation

Implementation initially will be the responsibility of the local sponsors and their supporters. If it is identified that Federal construction is warranted it may not be likely that sufficient funding to do major restoration rapidly would be available. It is recommended that a science based approach for incrementally restoring portions of the basin, monitoring the actual response, and incorporating the knowledge gained into the remainder of the work be used. This also applies to items implemented by the local sponsors, where we will use the results of those products to improve the future planning.

6. Technical Criteria Statement. This study will be conducted in accordance with Corps of Engineers criteria for watershed studies contained in the planning guidance notebook, ER 1105-2-100, and other applicable regulations and guidance. The final product will be a watershed study report and DSS as described above.

7. Quality Control.

a. This document is intended to serve as the Project Management Plan and the Quality Control Plan. The coordination, preparation and vertical team review of this scope of work assists in maintaining quality control. A separate Peer Review Plan has been developed for this project and is include as attachment 3.

b. An Independent Technical Review (ITR) is an important part of maintaining quality control. Senior technical staff from the Corps and other agencies, with expertise in economics, ecology, hydraulics and hydrology, and planning will conduct the ITR. The ITR team will meet with the Study Team initially, provide review comments on the technical approach to the tasks described above, and review study products as they are developed.

c. Technical representatives of the non-Federal Sponsors will be included on the ITR team and this will be an item of in-kind services that will be credited to the non-Federal cost share. The ITR is the primary method of quality control, but quality control will also be monitored through internal/Corps functional element reviews, Sponsor reviews, and Corps team conferences and reviews.

d. The ITR review will be ongoing through product development, rather than a cumulative review performed at the end of the study. All comments resulting from the ITR will be resolved prior to completing the watershed plan.

e. Documentation of the ITR will be included with the submission of the watershed study report

to the Corps Mississippi Valley Division. Documentation of the independent technical review will be accompanied by a certification, indicating that the independent technical review process has been completed and that all technical issues have been resolved.

f. Prior to the beginning of any task associated with the project, the project team and the technical committees will ensure that a proper scope of work is developed and that the expectations of the sponsor and all stakeholders are made clear. This will be critical to the success of this project and managing the overall expectations.

8. Risk Assessment. The following issues could lead to delays or increased costs:

a. Local Sponsor Support – The participating non-Federal agencies will need to provide in-kind technical services as described in this PMP.

b. Federal Support - Continued Congressional support will be required to secure federal funds for the study.

c. This is a large study and the study team will need to ensure that the expectations of all stakeholders are understood prior to moving forward with each phase or task.

9. Acquisition Plan – In-house Corps staff and non-Federal agency staff will conduct this study. No or limited contracting is anticipated. Corps ERDC SMART Program research funding and effort will augment the tasks and budget described in this PMP.

10. Communication Plan. The communication plan addresses internal and external project delivery team (PDT) communications.

a. Internal PDT Communications: PDT distribution lists will be established that include all in-house team members, Sponsors, and other stakeholders. All general project notifications will be delivered using these distribution lists. The Corps Project Manager (PM) will determine which correspondence is appropriate for each audience. E-mail will be the primary mode of communication within the PDT.

b. External communications: All news releases will be coordinated with St. Paul District Corps Public Affairs office. An initial news release will announce the start of the study. Subsequent news releases will announce any public meetings and development of reports or other products. Other releases will be considered as the study develops. Postings about the study on the St. Paul District's website and/or other partners' sites will also be used to communicate to the general public.

c. Public Involvement: Public involvement will include two informational meetings; one at the beginning of the study and another when the draft watershed management plan is complete. The Study Team may decide to hold other meetings or workshops with the public in the MRB to gain information or to conduct planning as part of the study process.

11. Change Management Plan

a. All changes to the scope, schedule or budget for this study must be coordinated with the PM. Whenever it becomes apparent that the current budget or schedule is likely to be inadequate, Study Team members must notify the PM so appropriate actions can be taken. The PMP is intended to be a living, flexible document, and changes must be coordinated before obligations are incurred by any party.

b. The PM, in consultation with the Study Team, will decide whether proposed changes are acceptable. The PM will revise the PMP as necessary to reflect approved changes.

12. Project Delivery Team (Study Team)

a. Sponsor agency and participating agency team members:
NEED TO ADD MEMBERS

b. Study Team Members:
St. Paul District

Title	Name
Project Manager	Craig Evans
Project Manager	Aaron Snyder
Coordination Specialist/Geomorphology	Rebecca Soileau
Environmental	Dan Wilcox
Economics	Jeff McGrath
Hydrology	Ann Banitt
Water Quality	James Noren
Hydraulics	Jon Hendrickson
GIS/LiDAR	Keith LeClaire
LiDAR Specialist	Aaron Buesing
Data Quality Manager	Greg Dasovic
Public Affairs Officer	Mark Davidson
Tribal Facilitator	Tom Crump
Civil/Site Engineer	Edith Pang
Small Business Office	Tom Koopmeiners
CEFMS/P2 Support	Theresa Thury

ERDC SWWRP Program

Program Manager	Steve Ashby CEERD-EP-P
Hydraulics/Hydrology	Billy Johnson CEERD-EP-W
	Robert Wallace CEERD-HF-HW
	Chuck Downer ERDC-CHL-MS
Water Quality	Aaron Byrd CEERD-HF-HW
Decision Support	Ken Pathak CEERD-IV-T
	Richard Cole CEIWR-GI

Executive Committee

Judy DesHarnais	Deputy for Programs and Project Management, St. Paul District, Army Corps of Engineers
John Wells	Director of Water Planning and Sustainable Development Minnesota Environmental Quality Board

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13. Customer Involvement and In-Kind Services. Study Sponsors and other stakeholders will be intimately involved in this study. Some of that involvement will qualify for credit against the non-Federal cost share as in-kind services, as detailed below.

a. In-kind services (work-in-kind) are locally provided services and/or supplies that the Sponsor may provide to offset a portion of their cost share for the feasibility study. The use of in-kind services in lieu of cash for feasibility (and watershed) studies is authorized by Section 105 of the Water Resources Development Act of

1986, as amended. Work-in-kind is an option for the Sponsor within certain guidelines, and the value of the actual costs of negotiated in-kind services can reduce the Sponsors' cash requirement. Work-in-kind is allowable when it: 1) provides value added, and/or 2) results in completing necessary work faster, cheaper, or better than the Corps of Engineers could alone or by contract. Work-in kind must be identified and documented clearly in the PMP before the work is begun.

b. In-kind services must be in accordance with federal regulations, including OMB Circular A-87.

c. Work-in-kind may be performed by the Sponsor or by their partners (non-Federal) and all work must be in accordance with the Feasibility Cost Sharing Agreement and be approved by the Corps of Engineers.

d. The process for claiming credit for in-kind services is:
1) negotiate the scope of services and associated costs between the Sponsor and the Corps,
2) document the actual expenditures made to accomplish the work-in-kind,
3) credit the local Sponsor with an in-kind service credit, based on actual expenditures, to reduce their cash contributions.

e. The value of in-kind services are estimated to be $4,205,000 from Minnesota sources as described in the attached study cost estimate spreadsheet Table 1. (Note: As this PMP is refined by the PDT it is likely that additional in-kind services will be added or modified via PDT recommendations and approval actions).

14. SCOPE OF WORK BY DISCIPLINE:

14.1. Planning, Programs and Project Management Division (PM): The division will assign a Project Manager to be responsible for reporting to the Project Review Board and to prepare required planning reports.

14.2. Project Management: The Project Manager will be responsible for monitoring project schedules and finances, processing schedule and cost change requests, reviewing budget documents, coordinating preparation of the Project Cooperation Agreement (PCA), and identifying and resolving problems and issues. Further, the Project Manager serves as the project planner with responsibility for performing study management activities, including: leading the study team, plan formulation, public involvement, preparing study schedules, monitoring the progress of technical work, and developing and preparing the feasibility report.

14.3. Natural Resources: The Environmental team member will be responsible for assessing environmental impacts, coordinating ecosystem restoration studies and accomplishing NEPA and cultural resource compliance activities. Natural Resources will conduct the necessary NER calculations and facilitate the Fish and Wildlife Service Coordination Act requirements.

14.4. Economics: The Economics team member will be responsible for conducting the required economic analyses and financial analysis for any environmental restorations as well as providing inputs to the Environmental Assessment/Environmental Impact Statement.

14.5. Geographic Information Systems: The Geographic Information Systems team member will provide maps, information for public involvement, and quantification of changes, along with other relevant information. They will assist with the LiDAR scope development and collection.

14.6. Social/Cultural: Social and Cultural issues of the study will be addressed by providing the necessary analysis to identify and determine which social and cultural issues are located within the project area.

14.7. Public Affairs Office/Public Involvement: The Corps' Public Affairs Office (PAO) and Public Information Specialist (PIS, from PM-E), in cooperation with the sponsors PAO, will be responsible for releasing public information to media entities and organizing stakeholder meetings.

14.8. Hydraulics and Hydrology: The Hydraulics and Hydrology Branch will be responsible for conducting hydrologic, hydraulic and water quality design studies.

14.9. Design Branch: The Design Branch will be responsible for developing designs and drawings, conducting structural investigations, and developing cost estimates for initial construction and operation and maintenance of alternative plans, and the selected plan. They will also be involved in the LiDAR acquisition and primarily responsible for coordinating the LiDAR mapping within the Corps which will include providing information on vertical and horizontal control, proper geo-referencing, and background aerial photos.

14.10. Surveys: The Surveys will be responsible for surveying and mapping activities which includes traditional surveys and LiDAR.

14.11. Real Estate Division: The Real Estate Division will be responsible for performing all required real estate activities for the project.

14.12. Recreation: Recreation analyses will be conducted by representatives from PM-E and ED-D (landscape design).

14.13_ Cultural Resources: The Cultural Resources team member will be responsible for the required cultural resources investigations and SHPO, Advisory Council, and tribal coordination to comply with Section 106 of the NHPA and its implementing regulation 36 CFR Part 800, as well as providing input to the Environmental Assessment/Environmental Impact Statement.

14.14 Engineer Research and Development Center (ERDC): The ERDC will assist in the modeling effort and will continue to develop and implement cutting edge technologies. Their involvement will be heavily dependent on what models the technical committee ultimately decides to progress with.

15. Tasks and Budget by Discipline. The scope of work for each task is described in Tasks Section 5 a through s above. Participating PDT members and disciplines are proposed in the attached study cost estimate spreadsheets Table 1.

16. MILESTONES AND REVIEW SCHEDULE: The milestones and schedule are summarized below. See **Section 4.0** for the assumptions used to develop the schedule. A Gantt Chart depiction of the original schedule can be found in attachment 2**.** It is assumed that the study will result in the identification and construction of at least 1 federal project which will require and Environmental Assessment.

FCSA Signed	August 2008
Begin Project Management and Modeling Meetings	August 2008
Small Watershed Modeling	August 2008
Simulate Existing Materials Transport Processes	April 2009
Simulate Natural Hydrologic Regime	August 2009
Simulate Natural Materials Transport Processes	October 2009
Assess the effects of altered land use	January 2010
Scale information to major watersheds	September 2009
Simulate MN River Water Quality	November 2009
Simulate Future Conditions	March 2010
Identify Future Condition Targets	January 2011
Select Management Measures	March 2011
Simulate Effects of Management Measures	April 2011

Simulate Economic impacts of Measures	April 2011
Simulate Environmental impacts of Measures	April 2011
Develop Decision Support System	April 2011
Deliver Decision Support System – Transfer	March 2012
Publish Draft DSS/Management Plan	December 2011
Publish Final DSS/Management Plan	December 2012
Federal Interest Project analysis Complete	February 2012
Begin analysis of Projects with Federal Interest	March 2012
Feasibility Scoping Meeting (FSM)	June 2012
Independent Technical Review	October 2012
Complete analysis of Projects with Federal Interest	December 2012
AFB meeting, Preliminary Draft Report	January 2013
EIS Notice of Availability	January 2013
Civil Works Review Board	March 2013
Public/Agency Review Draft Report	March 2013
Publish Final Report	May 2013
EIS Record of Decision Signed	May 2013
Congress Authorizes Construction	TBD

17. DELIVERABLE AND PREREQUISITE SCHEDULE: TBD

18. Statement of Approval. This PMP was originally approved on October 6, 2005 and modified on April 15, 2008. Subsequent changes have been coordinated with the Project Delivery Team.

/s/

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Craig O. Evans	Aaron M. Snyder
Project Manager	Project Manager

ATTACHMENTS
1. Table 1. Work allocation and cost estimate.
2. Table 2. Schedule of activities.
3. Peer Review Plan