Appendix A – Project Management Plan

MARSH LAKE ECOSYSTEM RESTORATION PROJECT
Minnesota River
FEASIBILITY STUDY

PROJECT MANAGEMENT PLAN

Revised: December 10, 2010

1. Purpose.

a. The purpose of this document is to identify the scope, schedule and budget for the Marsh Lake Ecosystem Restoration Feasibility Study. The study will evaluate a variety of measures to restore the ecosystem in Marsh Lake, an impoundment on the Minnesota River near Appleton, Minnesota. This document will serve as the Project Management Plan attached to the Feasibility Cost Sharing Agreement (FCSA) between the Corps and the non-federal Sponsor. (Note: the FCSA refers to this document as the "Project Study Plan.") This document also establishes quality control expectations and procedures to ensure that the study products meet applicable standards.

b. This project management plan, hereinafter referred to as the PMP, defines the planning approach, activities to be accomplished, 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, defines a contract between the Corps and the non-federal Sponsor, and reflects a "buy in" on the part of all the financial backers, as well as those who will be performing and reviewing the activities involved in the feasibility study. The PMP describes the initial tasks of the feasibility phase, continues through the preparation of the final feasibility report, the project management plan for project implementation and design agreement, and concludes with support during the Washington-level review of the final feasibility report.

c. The PMP is a basis for change. Because planning is an iterative process without a predetermined outcome, more or less time and costs may be required to accomplish reformulation and evaluations of the alternatives. Changes in scope will occur as the technical picture unfolds. With clear descriptions of the scopes and assumptions outlined in the PMP, deviations are easier to identify, the impact in either time or money is easily assessed, and decisions can be made on how to proceed.

d. The PMP is a basis for the review and evaluation of the feasibility report. Since the PMP represents a contract between the Corps and the non-federal Sponsors, it will be used as the basis to determine if the draft feasibility report has been developed in accordance with established procedures and previous agreements. The PMP reflects mutual agreements of the district, division, Sponsor and HQUSACE into the scope, critical assumptions, methodologies, and level of detail for the activities that are to be conducted during the feasibility study. Review of the draft report will be to insure that the study has been developed consistent with these agreements. The objective is to provide early assurance that the project is developed in a way that can be supported by higher headquarters.

e. The PMP is a study management tool. It includes scopes of work that are used for funds allocation by the project manager. It forms the basis for identifying commitments between the non-Federal Sponsor and the Federal government and serves as a basis for performance measurement.

2. Applicability. This PMP covers the feasibility stage of the project.

3. References.

a. Minnesota River Basin Reconnaissance Study, Section 905(b) (WRDA 1986) Analysis, Minnesota, South Dakota, North Dakota, and Iowa, dated December 2004 and approved January 13, 2005.

b. Feasibility Cost Sharing Agreement, Marsh Lake Feasibility Study, (Draft as of 02-May-07)

4. General/Background.

a. The Marsh Lake Feasibility Study was recommended in the December 2004 Minnesota River Reconnaissance study (approved January 13, 2005) and is authorized by a May 10, 1962 resolution of the House Committee on Public Works. Federal (Corps of Engineers) interest in Marsh Lake is based on the potential benefits of aquatic ecosystem restoration and the fact that the existing Marsh Lake Dam is owned and operated by the Corps of Engineers.

b. The Minnesota Department of Natural Resources (DNR) is sponsoring the study. The official Sponsor must sign the Feasibility Cost Sharing Agreement and provide 50% of all study costs through non-federal cash and in-kind contributions. The Corps of Engineers funds the remaining 50% of study costs.

c. The planning objectives are to restore aquatic and riparian habitat in Marsh Lake and restore connectivity between Lac qui Parle and the Pomme de Terre River. Marsh Lake is a shallow 5,000 acre reservoir with an average depth of approximately 3 feet. The Marsh Lake Dam, built by the Works Progress Administration in 1938, has a fixed crest elevation. The dam increased lake-like fish and wildlife habitat and created new colonial waterbird habitat, but it also disrupted natural flood plain functions and processes and blocked fish movement. The lack of natural flooding and drying cycles combined with increased sedimentation in the reservoir have caused a decline in plant diversity, water quality and associated fish and wildlife benefits over the years since the dam was built.

d. The study will evaluate a wide range of measures, including but not limited to those described in the "Agreement in Principle" signed by DNR Senior Managers in June 2003 (see Attachment A). The major features include modifying the Marsh Lake Dam to allow for periodic drawdowns, fish passage and more natural variation in water surface; returning the Pomme de Terre River to its pre-dam alignment; installation of breakwater structures to reduce sediment resuspension within the lake; and developing a management plan to define how the new features would be used. The study will also investigate policy issues and cost sharing requirements for implementation, considering the current Federal ownership of the dam and implications for future operation and maintenance responsibilities. The study team recognizes that many of the problems in Marsh Lake are symptoms of larger watershed issues. However, the team has chosen to limit the scope of this study to actions within the Lac qui Parle Wildlife Management Area. The study team believes that modifications in the vicinity of the dam and Marsh Lake are critical to restoring more natural habitat conditions. Opportunities to further enhance Marsh Lake habitat using actions in the greater watershed will be explored outside of this study.

e. The study will be conducted as outlined below. See Attachment B for a more detailed workflow plan.

1) Specify Problems and Opportunities: Meet with study team and others to refine problems and opportunities identified in the Reconnaissance Report and prior planning documentation. Conduct the National Environmental Policy Act (NEPA) scoping process.

2) Inventory and Forecast Future Conditions: Assess the existing condition of the Marsh Lake Dam and reservoir: foundation, structural integrity, hydraulic conditions, biodiversity, habitat conditions, water quality, etc. Obtain necessary field data, including but not limited to topographic surveys, sediment samples, and borings. Determine the "without project condition" of the Marsh Lake ecosystem.

3) Formulate Alternative Plans: Identify a system of structural and/or non-structural measures, strategies, or programs to alleviate problems or take

advantage of specific opportunities associated with water and related land activities within the project area.

4) Evaluate Effects of Alternative Plans: Assess the effects of combinations of measures to meet the planning objectives. Identify significant effects from institutional, public and technical perspectives. Conduct public involvement activities, coordinate with State and Federal agencies, and meet NEPA process requirements.

5) Compare Alternative Plans: Contrast the merits of identified alternatives with benefits, costs, effectiveness, and efficiency in meeting planning objectives .

6) Select a recommended plan: Select plan from identified alternatives and document.

7) Complete engineering investigations, geotechnical designs, mapping, hydraulics and hydrology, structural design, etc.

8) Prepare the feasibility study report and appendices for submission to Corps higher authorities to support a project recommendation to Congress.

   a. The study is estimated to cost $1,072,000,000 as detailed in Attachment C.

5. Technical Criteria Statement. This study will be conducted in accordance with Corps of Engineers criteria for Feasibility studies contained in the planning guidance notebook, ER 1105-2-100, and other applicable regulations and guidance. The final product will be a feasibility report documenting the study findings and National Environmental Policy Act (NEPA) determinations and making appropriate recommendations to Higher Authorities.

6. 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.

b. Agency Technical Review (ATR) is the primary method of quality control. ATR review will be ongoing through product development, rather than a cumulative review performed at the end of the investigation. The ATR review will be performed by a sister Corps District in coordination with the Ecosystem Restoration Planning Center of Expertise. The ATR team will include one person from a Division other than Mississippi Valley Division. The expertise and technical backgrounds of the ATR team members will qualify them to provide a comprehensive technical review of the product. The following disciplines will be required for the ATR team: hydraulics/hydrology, geotechnical engineering, general engineering/layout, structural engineering, cost engineering, plan formulation and environmental.

c. ATR comments and responses will be recorded in the online Dr. Checks system (www.projnet.org). Documentation of the independent technical review will be included with the submission of the reports to Mississippi Valley Division and HQUSACE. All comments resulting from the independent technical review will be resolved prior to forwarding the feasibility study to higher authority and local interests. The report will be accompanied by a certification, indicating that the independent technical review process has been completed and that all technical issues have been resolved.

d. Value Engineering Plan. Value Engineering (VE) evaluations provide another method for ensuring quality. The goal of VE on this project is to ensure that a full array of alternatives is considered in

order to maximize cost effectiveness. A VE study will be conducted during the plan formulation before the final array of alternatives has been defined. The VE study objectives will be to build upon the design team's preliminary plan formulation efforts, clarify the functional requirements of project features, and recommend additional conceptual alternatives to meet those requirements. The same team that performs ATR will conduct the VE study with additional technical representatives from the Sponsor. Sponsor participation will be an item of in-kind services.

e. Quality control will also be monitored via internal/District functional element reviews, Local Sponsor reviews, and Higher Authority/vertical team conferences and reviews.

f. The Sponsor will be responsible for quality control over deliverables provided as in-kind contributions. The Corps will verify that such contributions meet negotiated requirements and standards before granting cost-sharing credit for those contributions.

g. Review Plan. This feasibility study will not be subject to Independent External Peer Review (IEPR). The study is not anticipated to generate influential scientific information that would be either controversial or of sufficient risk and magnitude as to require Independent External Peer Review as described in Engineering Circular 1165-2-209. The draft feasibility report and environmental assessment will be distributed for public review as part of the normal NEPA review process. The review will be scheduled after the Alternative Formulation Briefing and before submitting the report to the Civil Works Review Board in accordance with the study schedule defined in the Project Management Plan.

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

a. Inadequate funding: Less funding is likely to be available each year than would be necessary for optimal progress on study tasks. Delays in funding (either federal or non-federal) will result in inefficiencies in the planning process and overall increased cost.
b. Sensitive environmental or cultural resources: Particular attention will be paid to environmental issues throughout the study to ensure that project recommendations are implementable.

c. Weather conditions: certain tasks, including but not limited to surveying, archeological investigations, biological surveys and similar assessments are weather-sensitive. These tasks will be scheduled to take advantage of anticipated weather conditions. If these tasks are delayed due to funding or other issues, the delay may significantly impact completion of the study on schedule.

8. Acquisition Plan. Work required for this study will be accomplished mainly by in-house Corps staff and non-federal in-kind services. Portions of the study will be accomplished by private firms under existing Indefinite Delivery Contracts with the Corps of Engineers. Services may also be obtained through small purchase actions when appropriate. The following major contracted acquisitions are anticipated:

a. Sediment sampling and testing ($20,000)
b. Geotechnical borings and testing ($50,000)

9. Communication Plan. The communication plan addresses internal project delivery team (PDT) and external 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 project manager 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 Public Affairs. An initial release announcing the start of the study will be made after the cost-sharing agreement is signed. Subsequent releases to announce public meetings will be made as needed. Other releases will be considered as the study develops. Postings on the St. Paul District's website and the DNR's sites will also be used to communicate to the general public.

c. A pre-product customer survey will be conducted at the initial team meeting. A post-product customer survey will be completed after the study is finalized.

d. Public Involvement: Public involvement will include one NEPA scoping meeting early in the study and an informational meeting after the draft report has been distributed for public review. These meetings will be planned, facilitated, publicized and documented by the Sponsor as work-in-kind. Additional public involvement will include hosting additional meetings as appropriate, and preparing news releases, on-line newsletter articles, and web pages. The Sponsor will perform the majority of these activities as work-in-kind and coordinate with St. Paul District Public Affairs.

10. Change Management Plan.

a. All changes to the scope, schedule or budget for this study must be coordinated with the Project Manager. Whenever it becomes apparent that the current budget or schedule is likely to be inadequate, project delivery team (PDT) members must notify the Project Manager so appropriate actions can be taken. The PMP is intended to be a living, flexible document, but it also represents a contract between the Corps and the non-federal Sponsor; therefore, changes must be coordinated before obligations are incurred by any party.

b. The Project Manager, in consultation with the Study Management Team and Executive Committee, will decide whether proposed changes are acceptable. The Project Manager will revise the PMP as necessary to reflect approved changes.

11. Project Delivery Team.

a. Executive Committee: The Sponsor and the Government will appoint named senior representatives to an Executive Committee, according to the Feasibility Cost Sharing Agreement (FCSA). The executive committee will include the St. Paul District's Chief, Planning, Programs and Project Management Division and the Director of the Fish and Wildlife Division, Minnesota Department of Natural Resources. The Executive Committee will function as described in the FCSA.

b. Study Management Team: The Executive Committee will appoint representatives to serve on a Study Management Team. The Study Management Team will keep the Executive Committee informed of the progress of the Study and of significant pending issues and actions, and shall prepare periodic reports on the progress of all work items identified in the PMP. The Study Management Team will include the St. Paul District's project manager and appropriate counterparts from the Minnesota Department of Natural Resources.

c. Sponsor and key study stakeholders:

Name	Organization	Phone	E-mail
Sponsor's Primary Representatives			
Varland, Ken	MN DNR, Wildlife	(507) 359-6030	ken.varland@dnr.state.mn.us
Aadland, Luther	MN DNR, Ecological Services	(218) 739-7449	luther.aadland@dnr.state.mn.us
Haukos, Norm	MN DNR Fisheries	(320) 839-2656	norm.haukos@dnr.state.mn.us
Trauba, David	MN DNR, Wildlife	(320) 734-4451	david.trauba@dnr.state.mn.us
John Schladweiler	MN DNR, Wildlife	(507) 359-6031	john.schladweiler@dnr.state.mn.us
Key Stakeholders			
Gelvin-Innvaer, Lisa	MN DNR	(507) 359-6033	lisa.gelvin-innvaer@dnr.state.mn.us
Fouchi, Cathi	MN DNR	(507) 359-6034	cathi.fouchi@dnr.state.mn.us
Lauer, Jack	MN DNR	(507) 359-6047	jack.lauer@dnr.state.mn.us
Popp, Walt	MN DNR	(651) 345-3331	walter.popp@dnr.state.mn.us
Kolander, Todd	MN DNR, Ecological Services		todd.kolander@dnr.state.mn.us
Kavanagh, Josh	Ducks Unlimited	(320) 220-1718	jkavanagh@duck.org
Kroger, Dick	CURE	(507) 768-3608	kroger@frontiernet.net
Moore, Patrick	CURE Executive Director	(320) 269-2984	cure-ed@info-link.net

d. St. Paul District Project Delivery Team:

Name	**Discipline**	**ORG**	**Phone***	**E-mail****
Thury, Theresa	PM-P, Programs	B6H4100	5309	theresa.j.thury
Wyatt, Michael	PD-F, Planning/Project Mgmt	B6H4200	5216	michael.d.wyatt
	PM-E, Env and Econ	**B6H4300**		
Awsumb, Lance	Economics		5379	lance.g.awsumb
Wilcox, Dan	Environmental		5276	daniel.b.wilcox
Gnabasik, Virginia	Cultural		5262	virginia.r.gnabasik
LeClaire, Keith	GIS		5491	keith.r.leclaire
	EC-D, Cost&Specs&General	**B6L1DCS**		
Bray, Matt	Cost & Specs		5647	matthew.m.bray
Tschida, David	General Engineering		5585	david.m.tschida
Behling, Chris	EC-D, Geotech	B6L1DGG	5572	christopher.w.behling
	EC-D, SMEA	**B6L1DSM**		
Sauser, Phillip	Structures		5722	phillip.w.sauser
TBD	Mechanical			
TBD	Electrical			
Lewis, Corby	EC-H, Hydraulics	B6L1HHC	5635	corby.r.lewis
Chamberlin, Ferris	EC-H, Water Control & Hydrology	B6L1HWC	5619	ferris.w.chamberlin
Peterson, Ken	RE-PA, Planning & Appraisal	B6N0PA0	5359	kenneth.j.peterson
Linder, Dawn	CT-C, Contracts	B6P0A00	5407	dawn.m.linder
Bertschi, Tim	OP-RNW, Recreation and NR Project Office		701-232-1894	tim.s. bertschi
Melby, Randy	OP-RNW, Lac Qui Parle Project		320-269-6303	randy.d.melby

* All Phone numbers begin with "**651-290**" unless shown otherwise.
** All e-mail addresses end with "**@usace.army.mil**"

12. Customer Involvement/in-kind services. The Sponsor and other stakeholders will be intimately involved in this study. Some of that involvement may 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 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 Sponsor's 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. In-kind services must be in accordance with federal regulations, including OMB Circular A-87.

b. Work-in-kind must be performed by the Sponsor or by another non-federal partner under an approved third-party agreement with the Sponsor. All third-party agreements must be in accordance with the Feasibility Cost Sharing Agreement and be approved by the Corps of Engineers.

c. 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) Sponsor performs the work and produces the required product,
   3) Sponsor documents the actual expenditures made to accomplish the work-in-kind,
   4) Corps verifies acceptability of the product relative to negotiated requirements,
   5) Corps credits the local Sponsor with an in-kind service credit.

d. Marsh Lake is integral to the Sponsors' Lac qui Parle Wildlife Management Area. Because the DNR is currently managing this resource, it is uniquely qualified to perform much of the analyses required in the study. This project management plan will not attempt to precisely scope or quantify every task to be completed as in-kind services. Rather, only those tasks that could reasonably be done by the Corps will be estimated in detail (such as topographic and archeological surveys). Cost estimates for other tasks that are less defined but clearly "add value" will be treated with great flexibility to allow for full collaboration during the study.

e. The value of in-kind services is estimated to be $234,000 from the Minnesota Department of Natural Resources as described in Paragraph 13—Scope of Work and the attached study cost estimate spreadsheets. (Note: as the study progresses, it is likely that additional in-kind services will be added via PDT recommendations and Executive Committee approval actions).

13. Scope of Work. The scope of work for each task and discipline is described in the attached study cost estimate spreadsheet. Major tasks and deliverables are described below and assigned to either the Corps or Minnesota DNR for primary responsibility:

a. Public Involvement:
   1) (DNR) Host, publicize and facilitate two public meetings:
      a. Public coordination meeting early in the study, and
      b. during the public review of the draft report, collect public input resulting from the meetings and provide written summaries for inclusion in study documents.
   2) (DNR) Maintain current project information for the public on the Internet, prepare newsletters, press releases, etc. as deemed appropriate throughout the study.
   3) (Corps) Participate at public meetings. Review and approve newsletters, press releases and proposed Internet content.

b. Institutional Studies:
   1) (Corps) Investigate project history, intergovernmental relations, and cost-sharing arrangements for implementing project recommendations

c. Social Studies:
    1) (DNR) Conduct recreation needs analysis and justification for recreation features, possibly including a bike trail and bridge, boat ramps, and other amenities. Tasks may include:
        a. Compile Corps and MN DNR recreation visitation records over last 10 years
        b. Meet with Corps LQP project manager, recreation specialist to obtain data
        c. Compile MN DNR LQP State Park visitation data, creel survey data, etc.
        d. Forecast future recreational activity in the project area
    2) (DNR) Write draft Feasibility report sections to document existing, future without-project, and future with-project recreation conditions. Provide documentation to support all recreation features included in the recommended plan.

d. Cultural Studies:
    1) (Corps) Provide scope of work for cultural resources survey, and coordinate with SHPO
    2) (DNR) Perform field archeology/cultural resources survey

e. Environmental Studies: Environmental design and NEPA process
    1) (Corps) Prepare the Environmental Assessment and Section 404(b) evaluation
    2) (Corps) Edit and finalize feasibility report sections, environmental appendix and management plan/operation manual
    3) (Corps) Prepare GIS products for EA, displays for public meetings
    4) (Corps) Obtain sediment testing for 404(b) evaluation & State Water Quality Certification
    5) (Corps) Coordinate approval of planning models with Corps Planning Centers of Expertise
    6) (Corps) Assist DNR in setting goals, objectives and constraints.
    7) (Corps) Assist DNR in assessing existing conditions, developing operation plans and forecasting future conditions.
    8) (DNR) Inventory existing conditions in Marsh Lake, Pomme de Terre River and Lac qui Parle, including all items noted in Attachment B, Workflow plan. Use existing information where possible, and collect any new information necessary to document conditions that is not included in other specific deliverables.
    9) (DNR) Forecast future conditions without project. Use professional judgment and approved models.
    10) (DNR) Develop operating plans for proposed features/changes.
    11) (DNR) Forecast future conditions with-project, define effects of proposed changes and assess project benefits/impacts. Use professional judgment and approved models.
    12) (DNR) Write draft Feasibility report sections describing existing, future without-project and future with-project conditions and proposed operation plans.

f. Fish and Wildlife: (Corps) Fulfill Fish and Wildlife Coordination Act requirements

g. Economic Studies: (Corps) Cost effectiveness and incremental cost analysis of alternatives

h. Surveying and Mapping:
    1) (DNR) Obtain field surveys including:
        a. Pomme de Terre cross sections: approximately 34 sections with soundings, avg. 1000 feet per section
        b. Embankment profile and sections:
            i. Complete road/embankment profile (9900 feet);
            ii. 99 cross sections, define embankment and areas within 100 feet upstream and downstream of embankment toes (upstream area is under water)
        c. Soundings and surveys near outlet structures

i. Complete topo mapping at existing structures and parking area
ii. Soundings above and below existing spillways: 10 foot grid within 100 feet upstream and 200 feet downstream of structures.

2) (DNR) Prepare mapping, digital terrain models, and cross sections for use in engineering design and GIS applications

i. Hydrology and Hydraulics:

1) (DNR) Lead the effort to refine problems and opportunities, project goals, objectives and constraints as described in Attachment B, Workflow plan. Conduct discussions and analyses necessary to finalize design parameters for features to be constructed.
2) (DNR) Participate in hydrologic design discussions and review Corps HMS modeling
3) (DNR) Participate in field inspections of the Pomme de Terre River existing and proposed channels
4) (DNR) Assist with designing fish passage structures: review Corps HEC-RAS
5) (Corps) Perform hydrologic and hydraulic analyses: Marsh Lake and Pomme de Terre hydrology (discharge duration, frequency analyses)
6) (Corps) Route historic hydrographs through Marsh Lake using a simple HMS model
7) (Corps) Produce stage duration relationships for different outlet weir configurations
8) (Corps) Design outlet weirs and other hydraulic features of outlet structures
9) (Corps) Design hydraulic features of Pomme de Terre re-alignment (diversion, bridge, new channel, scour protection, etc.)
10) (Corps) Determine Rosgen class of Pomme de Terre cross sections
11) (Corps) Conduct field inspections of Pomme de Terre geomorphology (existing and proposed channels)
12) (Corps) Design fish passage structures using HEC-RAS
13) (Corps) Design wave protection for the entire Marsh Lake Dam
14) (Corps) Prepare GIS information as needed to display hydrologic and hydraulic conditions
15) (Corps) Write hydraulics appendix for the feasibility report and pertinent portions of the main report and environmental assessment.

j. Foundations and Materials:

1) (Corps) Geotechnical design
2) Borings and testing
3) Stability issues at all structures and embankment
4) Review Periodic Inspection issues
5) Geotechnical appendix for report

k. Designs and Cost Estimates: (Corps) Structural and layout issues, construction cost estimates

l. Structural designs

1) Primary outlet (modify or replace)
2) Variable-crest outlet/emergency spillway
3) Fish passage
4) Pomme de Terre re-alignment
1. Bridge
2. Diversion structure
5) Incorporate pedestrian/bike traffic across the project
6) Structural appendix to report
7) Modify abandoned fish rearing pond
8) Modify Lewisberg Road Culverts

m. Mechanical designs

1) Operable gates

n. General Engineering
    1) Drawings
        1. Site plans for structures
        2. Typical sections
        3. Pomme de Terre re-alignment layout
        4. Fish passage layout
    2) Quantities

o. Cost estimating
    1) Estimates for all alternatives (assume 4 alternatives)
    2) Appendix to report

p. Real Estate Studies: (Corps and DNR) Assess real estate needs for project site, borrow and disposal areas

q. Study Management: (Corps and DNR) Administration, cost tracking, general coordination, Project Cooperation Agreement development

r. Plan Formulation: Developing, comparing and assessing alternatives
    1) (Corps) Assist in establishing problems/opportunities/goals/constraints
    2) (Corps) Assist in establishing future without-project condition
    3) (Corps) Lead alternative formulation and screening efforts
    4) (Corps) Conduct Milestone meetings: Feasibility scoping meeting, Alternative Formulation Briefing, and Civil Works Review Board (in Washington, DC)
    5) (Corps) Independent Technical Review
    6) (Corps) Value Engineering study
    7) (DNR) Participate in Milestone meetings
    8) (DNR) Participate in a Value Engineering study

s. Report Preparation:
    1) (Corps) Future without-project analysis
    2) (Corps) Feasibility scoping meeting package
    3) (Corps) Alternatives analysis for AFB meeting
    4) (Corps) Draft report for public review and Civil Works Review Board
    5) (Corps) Final report
    6) (DNR) Review draft report before public review

14. Budget By Discipline: See Attachment C.

15. Deliverable and Prerequisite Schedule:

Activity ID	Activity Name	Duration (Days)	Start	Finish
Plan Formulation		2113.0d	02-May-07 A	27-Sep-13
FEA2420	Plan Formulation - Federal	670.0d	02-May-07 A	4-May-10
FEA2429	Feasibility Scoping Meeting	0.0d		11-Dec-07 A
FEA2430	AFB Project Doc	10.0d	05-May-10*	18-May-10
FEA2440	AFB Tech Review	19.0d	19-May-10	15-Jun-10
FEA2450	AFB Policy Compl	30.0d	19-May-10	30-Jun-10
FEA2460	Feas Alternative Formulation Briefing (AFB)	0.0d		19-Jul-10*
FEA2470	AFB Guid. Memo	10.0d	20-Jul-10	2-Aug-10
Feasibility Report		970.0d	23-Jul-07 A	18-Jul-11
FEA2480	Draft Feasibility Rpt/NEPA	38.0d	19-Aug-10	13-Oct-10
FEA2490	Conduct ITR	148.0d	23-Jul-07 A	11-Jan-08 A
FEA2492	Conduct ATR (Future)	90.0d	19-May-10	24-Sep-10
FEA2500	Submit Draft Feasibility Report	0.0d		13-Oct-10
FEA2505	HQ Policy Compliance Review	30.0d	14-Oct-10	26-Nov-10
FEA2570	Feas Review Conference (FRC)	0.0d		26-Nov-10
FEA2571	Feasibility Proj Guide Memo (PGM)	0.0d		26-Nov-10
FEA2575	Feasibility Public Review Period Start	0.0d	14-Oct-10	
FEA2577	Public Review Comments	30.0d	14-Oct-10	26-Nov-10
FEA2580	Prepare Final Report & Summary	19.0d	29-Nov-10	23-Dec-10
FEA2590	Issue Division Engineer's Transmittal Letter	0.0d		23-Dec-10
FEA2640	Washington Level Policy Review	19.0d	27-Dec-10	24-Jan-11
FEA2650	CWRB Briefing/Approval	0.0d		24-Jan-11
FEA2655	Prepare Draft Chief's Report	5.0d	25-Jan-11	31-Jan-11
FEA2657	State & Agency Review	48.0d	1-Feb-11	8-Apr-11
FEA2658	Feas State/Agency Review Complete	0.0d		8-Apr-11
FEA2660	Sign Feas Chief's Report	0.0d		8-Apr-11
FEA2670	ASA(CW) Review	9.0d	11-Apr-11	21-Apr-11
FEA2700	ASA(CW) Memo to OMB	0.0d		21-Apr-11
FEA2709	OMB Review & Comment	60.0d	22-Apr-11	18-Jul-11
FEA2710	Feas Report to Congress	0.0d		18-Jul-11
Planning, Engineering & Design (PE&D)		161.0d	3-Oct-11	22-May-12
115058.300001.30AX0	PE&D Prog & Proj Mgmt	161.0d	3-Oct-11	22-May-12
A1400	Future FY planning - Fed	161.0d	03-Oct-11*	23-May-12
Construction		288.0d	1-Oct-12	22-Nov-13
115058.30D001.30DS0	Construction - Contract	288.0d	1-Oct-12	22-Nov-13

16. Statement of Approval: As of May 21, 2010, this PMP has been coordinated with the Project Delivery Team and has been adjusted based on resolution of comments received and is approved.

_____

Michael Wyatt
Planner/Project Manager

ATTACHMENTS

A. Minnesota Department of Natural Resources "Agreement in Principle," executed June 12, 2003
B. Workflow Plan
C. Feasibility Study Cost Estimate
    a. Total Project Detail (2 pages)
    b. DNR Detail (2 pages)

ATTACHMENT A
MINNESOTA DNR “AGREEMENT IN PRINCIPLE”

Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-40

July 11, 2003

Mr. Craig Evans, P.E.
U.S. Army Corps of Engineers
190 East Fifth Street
Saint Paul, Minnesota 55101-1638

Dear Mr. Evans:

This letter is to formally convey to the U.S. Army Corps of Engineers (USACE) the framework decision that has been agreed upon by the Minnesota Department of Natural Resources' (DNR) Divisions of Ecological Services, Fisheries, and Wildlife regarding the Marsh Lake Dam modification that will result in definite improvements to Marsh Lake's biological values. We are proposing that both the primary spillway and the emergency spillway be modified. We are also proposing that the Pomme de Terre River be restored to its pre-1938 channel. The attached Agreement in Principal outlines those proposed modifications. It also provides particular terms and constraints regarding the management of the facility.

There are several additional steps that the DNR needs to take, these include: communication with the public regarding our framework decision, development of a more detailed management plan, continue to evaluate other potentially interesting restoration strategies, and then determine and pursue the most appropriate means of funding for this project.

It has been our approach all along that once we can identify and agree upon the strategies that will have the greatest benefit for the resource and resource users, we will focus on financing and implementation. We recognize that the Marsh Lake dam is owned and managed by the USACE, and so we plan to work closely with the USACE to determine how best to pursue the funding and implementation. As a first step, the DNR would like to see the Marsh Lake dam modifications included in the Minnesota River Basin Reconnaissance study.

Sincerely,

TIMOTHY P. BREMICKER, Director
Division of Wildlife
DNR Building – 500 Lafayette Road
Saint Paul, Minnesota 55155-4007
(651) 297-4960

TPB/KV/jls; Attachment
c Bradley M. Moore, Assistant Commissioner for Operations
Ron Payer, Director, Division of Fisheries
Lee Pfannmuller, Director, Division of Ecological Services
Cheryl Heide, Regional Director, New Ulm

Agreement in Principle

Preamble

Marsh Lake is a 5,000 acre, shallow impoundment on the upper Minnesota River. It is located at the borders of Big Stone, Lac qui Parle and Swift Counties. Because of the nature of the existing fixed crest the basin is not subject to the dynamic variation in water levels that healthy wetland systems require. This facility is part of the US Army Corps of Engineers Lac qui Parle Flood Control Project. However, its origins predate the flood control project as a WPA water conservation project. The USACE has notified the Department of Natural Resources that the facility provides no flood control benefit. The USACE has requested the Minnesota DNR recommend appropriate modifications to the facility in order to enhance ecological and recreational values of the basin and the Minnesota River. A work group of six DNR staff have been working on developing a set of recommendations to the USACE since January 2001. This framework carefully balances a number of potentially competing natural resource and recreational values associated with Marsh Lake and the Minnesota River. We, the undersigned Senior Managers, agree in principle to the below described framework to improve and enhance Marsh Lake.

Modifications to the Marsh Lake Dam

The Marsh Lake Dam is an earthen berm 11,800 feet long, with a primary spillway 112 feet wide set at a run out elevation of 937.6 feet. It also has a 90 foot wide emergency spillway with a run out elevation of 940 feet. The DNR would propose to the USACE the following modifications to the Marsh Lake Dam.

Primary Outlet: The primary spillway would be modified to maintain a water surface elevation of 938.3 feet or higher 70% of the time in August, and 937.6 feet or higher 70% of the time in September and October, excluding years in which a draw down is completed. A design, based on returning the Pomme de Terre River to its 1938 channel, would incorporate both a low flow notch cut into the spillway and a narrowing of the spillway above the current run out elevation. The low flow notch would be approximately 2 feet wide with a bottom elevation of 935.5 feet. In addition, the spillway would be narrowed from 112 feet to approximately 30 feet between the elevations of 937.6 to 938.3. The spillway would then widen back out to 112 feet above the 938.3 feet elevation. A fish passage structure consisting of rock riffles would also be constructed at the outlet.

Emergency Spillway: The emergency spillway would be replaced with a variable crest structure. The structure's final dimensions will be set to pass a May Q70 flow at a draw down elevation of 936. A fish passage structure consisting of rock riffles would also be constructed at this outlet. The structure will continue to function as an emergency spillway at water surface elevations above 940 feet.

Pomme de Terre River: The Pomme de Terre River will be restored to its 1938 Channel and flood plain. As a result, the Pomme de Terre will flow directly into the Minnesota River/Lac qui

Parle Lake downstream of the Marsh Lake dam. During some flood events, a portion of the Pomme de Terre's flow may spill over into Marsh Lake.

Management Plan

The above modifications are contingent upon a management plan being developed that includes the following core points.

- The maximum targeted drawdown will be to an elevation of 936.
- Clear triggers and constraints will be established that govern when a draw down will be attempted including: vegetation, sufficient year classes of northern pike present, and sufficiently small snow pack to predict a reasonable probability of success.
- When active drawdowns are conducted, the basin will remain in drawdown condition through the fall and winter. Refill will be accomplished during spring floods. However, refill or partial refill in the fall could be accomplished if precipitation results in a spike in the Minnesota River's flow, such that a "normal" discharge hydrograph can be maintained while raising pool levels.
- Consecutive attempts at drawdowns over a multiple year period will not be made.
- Fish passage will be available at one or both of the outlets 100% of the time.
- A monitoring program will be developed which includes: vegetation, fish populations, waterfowl populations, and flows.
- In the event of unanticipated water levels or vegetative responses, appropriate modifications could be made to the primary spillway or the management plan.

Agreement

While additional detailed management plans and construction designs will needed to be developed, we agree in principal to the above described framework for modifying and managing the Marsh Lake Dam

Tim Bremicker, Director Date 6/12/2003
Division of Wildlife

Ron Payer, Director Date 6/12/03
Division of Fisheries

Cheryl Heide, Regional Director Date 6/11/03
Southern Region

Lee Pfannmuller, Director Date 6/12/03
Division of Ecological Services

ATTACHMENT B
WORKFLOW PLAN

The following outline describes the general workflow expected for the study. Bullets indicate the types of information that will be needed and questions that will be asked. These planning steps are iterative, so the actual order of task completion will evolve with the study and will depend on funding and staff availability over the life of the study.

1. Gather all existing planning documentation from prior MN DNR efforts

- Meeting notes
- Preliminary plans
- Public comments

2. Specify problems and opportunities: This task will be a refinement of the work that led to the Agreement in Principle. It will involve group discussion and integration of data from the inventory of existing conditions.

- State problems and opportunities (See Agreement in Principle)
- Determine project goals (what are we shooting for?)
    - Target species (fish, pelicans, waterfowl, other?)
    - Habitat types to be developed and maintained
    - Water quality standards
        - (seasonally different?—i.e. is winterkill desirable?)
- Determine project objectives and constraints (what changes are needed to meet the goals? What do we need to avoid?)
    - Desirable water levels, fluctuation and timing
        - Normal operations
        - During a drawdown
        - How low is too low?
        - *How will we determine these? What models are needed to predict outcomes of specific measures?*
    - Fish passage—define parameters
        - When do fish need to pass?
        - Access to spawning areas in PdT and Marsh Lake with various measures
    - Water quality—nutrient balance, determine what actions can we really control?
    - Recreation needs
        - Access to the lake(s)
        - Pomme de Terre canoeing?
        - Future bike trail?

3. Hold a NEPA scoping meeting

- Make sure the public has input into the current study process and can identify any special concerns to be addressed. (Do this as soon as we have sufficient Federal funding.)

4. Inventory existing conditions

- Water quality
    - Marsh Lake
    - Pomme de Terre
    - Lac qui Parle
        - DO
        - N, P
        - Chlorophyll A, algal density
        - Suspended solids
- Fish & mussel populations (in all three water bodies)
    - Mussel survey
    - Assemble existing fish survey info
- Macro-invertebrates

- Wildlife populations (waterfowl, pelicans, uplands)
- Rare and endangered species
- Aquatic vegetation (submersed, emergent, and algal)
- Land use/land cover in study area
- Bathymetry (provide most recent data available)
- Assess Pomme de Terre channel (i.e. Rosgen, existing and old alignment)
- Sediment budgets—Marsh Lake and Lac qui Parle
- Recreational usage, hunting, birding, fishing, access for all, biking, canoeing
- Safety history
- Obtain topographic surveys, cross sections, soundings, etc.
- Cultural resources
- Real estate needs
- Hydrologic records
- Sediment sampling and testing for dredging disposal/permitting
- Corps and State authorities and responsibilities

5. Forecast future conditions in all three water bodies <u>without</u> the project

- Water quality
- Water levels and fluctuations—impacts of upstream reservoirs, i.e. Bigstone
- Fish and mussel populations
- Wildlife populations
- Aquatic vegetation
- Sedimentation
- Recreation

6. Preliminary plan formulation: Formulate alternative plans

- Define <u>measures</u> to achieve objectives
    - Re-assess details of the Agreement in Principle
    - Value Engineering study to identify possible enhancements or additional measures
- Hydrologic and Hydraulic design of structures to achieve target water levels
- Preliminary ITR to check future without project conditions analyses and preliminary H&H

<u>7. Hold a Feasibility Scoping Meeting (FSM) with vertical team</u>

8. Advanced plan formulation: Formulate alternative plans

- Preliminary design and refining of measures (mostly engineering tasks with guidance from all)
    - Pomme de Terre realignment
        - Diversion structure
        - Bridge or structure to cross roadway
        - Determine new alignment
    - Variable crest structure
    - Fixed crest structure (elliptical profile)
    - Fish passage structures
    - Provide bike crossing capability
    - Earth dam issues
    - Other (Islands, recreation features)
- Geotechnical borings and analyses
- Structural design
- Cost estimating
- Prepare operating plans

9. Evaluate effects of alternative plans

- Describe future conditions with project in place (mostly environmental discussion—includes obtaining sufficient data and modeling to document assumptions)

10. Compare alternative plans

- Prepare a matrix (use IWR Plan software) to conduct cost-effectiveness and incremental cost analyses

11. Select Tentatively Recommended plan

- Prepare AFB documentation package/draft report
- Independent Technical Review
- Study team review

12. Hold Alternative Formulation Briefing (AFB) with Corps vertical team

- Either by telephone or on site

13. Final plan formulation and design details for recommended plan

- Develop detail sufficient for baseline cost estimate (engineering tasks)
- Prepare plates and design calculations for engineering appendixes

14. Prepare final draft report

- Finalize draft report
- Study team review
- Independent Technical Review
- Incorporate comments

15. Public review of final draft report per MEPA and NEPA

- 30-day review period
- Hold a Public meeting
- Incorporate comments/address issues/finalize MEPA
- Sign FONSI (unless EIS is required)
- Final ITR signoff (to verify acceptability of final changes)

16. Submit draft report to MVD and HQUSACE for policy review

17. Conduct Civil Works Review Board briefing

- Key study team members travel to Washington, D.C.

18. Prepare Chief of Engineers' report
19. NEPA State and Agency review of Chief's report
20. HQUSACE submit signed Chief's report to ASA(CW)
21. ASA(CW) sign Record of Decision and submit signed Chief's report to OMB
22. OMB review and submit ROD and Chief's report to Congress

ATTACHMENT C
ESTIMATED STUDY COSTS

Marsh Lake Aquatic Ecosystem Restoration
Feasibility Study Cost Estimate
August 2009

Total Project Detail

	Task Description	Estimated Cost ($ Thousands) Corps	In-kind*	Study Total	Notes:	Thru 06/09 Estimates	FY 2009 4 Qtr Jul-Sep	FED FY 2010 1 Qtr Oct-Dec	2 Qtr Jan-Mar	3 Qtr Apr-Jun	4 Qtr Jul-Sep	FY 2011 1 Qtr Oct-Dec	Total
A	**Public Involvement**	0	9	9	Public meetings, newsletters, etc.	0							
	Public Meetings (arrange and facilitate)		4		Assume 2 meetings: scoping and draft review	0			0		4		$4
	Prepare record of comments		2			0			0		2		$2
	News releases and Newsletters		3			0			0		2	1	$3
	Corps participation at meetings	0	0		Assume included in numbers below	0					0		$0
			0			0							
B	**Institutional Studies**	5	0	5	Project history, intergovernmental relations. Determine appropriate program/cost-sharing policy.	3			2				$5
			0			0							
C	**Social Studies**		7	7	Recreation, etc.	0							
	Conduct recreation needs analyses		5			5							$5
	Draft report sections for recreation		2			2							$2
			0			0							
D	**Cultural Studies**	5	16	21	Cultural resources survey, coordination	0							
	Corps admin and report writing	5	0		Admin, analysis, coordination with SHPO	2	0	3					$5
	Field surveys		16		To be done by DNR staff archaeologists	0	16						$16
			0			0							
			0			0							
E	**Environmental Studies**	97	52	149	Environmental design and NEPA process	0							
	GIS products for EA	6	4			0	6	2	2				$10
	Write EA, Feas report, ops plan & appendix	55	0			17	10	10	6	3	6	3	$55
	Coordination & meetings	16	0			8			2	2	2	2	$16
	Sediment testing	20	0		Contracted	0		20					$20
	(DNR) Inventory existing conditions		20		Gather existing info, collect data if needed	20							$20
	(DNR) Forecast future with- and without-project		18		DNR lead team discussion and modeling	8					10		$18
	(DNR) Write draft report sections		10		Describe existing, future-without and future with-project conditions for Feasibility report	10							$10
			0			0							
			0			0							
F	**Fish and Wildlife**	5	0	5	Coordination Act Requirements W/FWS	0	5						$5
			0			0							
G	**Economic Studies**	15	0	15	Recreation benefits, economic justification, incremental cost analysis	3	2	2	2	2	2	2	$15
			0			0							
H	**Surveying and Mapping**	5	20	25	Topography, cross sections, soundings	0							
	Coordination and admin		3			3							$3
	Pomme de Terre River cross sections		4		Most done December 2006. Re-do portions originally out of tolerance.	4							$4
	Embankment cross sections		0		Done December 2006	0							$0
	Outlet structures and site topography		0		Done December 2006	0							$0
	Soundings/bathymetry near outlet		3		Most done Dec 2006 except u.s. soundings	3							$3
	Reducing/plotting/mapping		10		Office caculations	10							$10
	Corps coordination	5	0			5							$5
			0			0							
J	**Hydrology and Hydraulics**	84	42	126	Hydraulic design of channel and dam mods	0							
	(Corps) Hydrology	12	2		Marsh lake and PdT discharge/duration history	7		5	2				$14
	(Corps) Terre RAS modeling of PDT, Marsh Lk, LQP	30	2		Existing and proposed conditions	8		23	1				$32
	(Corps) Pomme de Terre Geomorphology	6	2		Rosgen classification, field inspections	6		1	1				$8
	(Corps) Fish Passage (1-D modeling)	0	2			0	0	1	1				$2
	(Corps) Scour protection	9	2		Wave protection and stream erosion protection	0		6	5				$11
	(Corps) Feasibility appendix, coord & GIS	27	2			2	2	2	5	6	6	6	$29
	(DNR) Determine goals, objectives, constraints		6		DNR lead team discussion	5		1					$6
	(DNR) Hydrology		5		DNR participate and review	0	2	2	1				$5
	(DNR) Pomme de Terre Geomorphology		4		DNR field inspections with Corps	2		1	1				$4
	(DNR) Fish Passage		3		DNR assist design, review models	0	0	2	1				$3
	(DNR) Develop operation plans for alternatives		11		DNR lead team discussion and modeling	4			6	1			$11
	(DNR) Review H&H appendix		1			0			1				$1
						0							
						0							
						0							
						0							
K	**Foundations and Materials**	138	3	141	Geotechnical design	0							
	Review existing data	6	1			0	6	1					$7

	Borings and testing	60	1		Contracted	0	0	61					$61
	Assess stability/ geotechnical design	60	1			0	0		21	27	13		$61
	Feasibility report appendix	12	0			0			0		12		$12
			0			0							
M	**Designs and Cost Estimates**	**181**	**20**	**201**	Structural and layout issues, construction cost estimates	0							
			0			0							$0
	Structural design		0		All designs to feasibility level of detail.	0							$0
	PdT diversion and road bridge	8	2			0	6	4					$10
	Emergency spillway new operable structure	12	2			0	3	3	8				$14
	Existing spillway modifications	5	2			0	2	2	3				$7
	Pedestrian/bike bridge	6	1		To accommodate future bike trail	0	2	2	3				$7
	Feasibility appendix and coord	18	2			0	5	2	13				$20
	Fish Passage	0	3			0		2	1				$3
	Fish Pond Mods (Inlet and Outlet)	0	1			0		1					$1
	Lewisberg Road Culverts	0	3			0		2	1				$3
			0			0							$0
	Mechanical design	6	0			0	2	3	1				$6
			0			0							$0
	General engineering/layout		0			0							$0
	Site plans, typical sections, layout	84	2			7	15	23	10	25	4	2	$86
	Quantity calculations	12	2			0		4	3	7			$14
			0			0							
	Cost estimates	30	0		Establish alternative costs and final baseline cost for authorization	0	12	6	6	3	1	2	$30
			0			0							
N	**Real Estate Studies**	**10**	**3**	**13**	Project site, borrow and disposal areas	0							
	Corps staff activities	10	0		Real Estate Plan and appraisals	0	7		2	1			$10
	DNR staff activities		3		Assist with local knowledge	0	3						$3
			0			0							
P	**Study Management**	**92**	**16**	**108**	Administration, cost tracking, coordination	0							
	General coordination	52	0		Includes Executive Committee time	22	5	5	5	5	5	5	$52
	Study funds control	38	0			14	4	4	4	4	4	4	$38
	Project Cooperation Agreement for construction	2	0			0					2		$2
	DNR in-kind for study management		16		Includes Executive Committee time	3	2	2	2	2	2	3	$16
			0			0							
Q	**Plan Formulation**	**74**	**13**	**87**	Developing and assessing alternatives, milestone meetings, ITR review	0							
	Corps PM guide early planning tasks	2	0			2							$2
	Preliminary formulation & screening	2	0			2							$2
	Feasibility Scoping Meeting	2	0			2							$2
	Alternative Formulation Briefing	6	0			0				6			$6
	CWRB meeting (in Washington, D.C.)	12	0			0					3	9	$12
	Independent Technical Review (ongoing) & VE	50	0		Performed by another MVD District	15				24	11		$50
	Value Engineering Study (in-kind participation)		6		Assume 3 people for 3 days	3						3	$6
	DNR in-kind attendance at milestone meetings		7		Feasibility Scoping Meeting, AFB & CWRB	1				3		3	$7
			0			0							
R	**Report Reviews**	**52**	**16**	**68**	Prepare draft and final reports of findings	0							
	Without-project analysis	5	0			5							$5
	Feasibility scoping meeting documents	8	0			8							$8
	Alternative analysis for AFB meeting	21	0			5	5	5	6				$21
	Draft report for public review & CWRB	12	0			0				6	6		$12
	(DNR) review draft reports		16		Assume 2 rounds of review	0		3	5	3	2		$13
	Final report	6	0			0						9	$9
			0			0							$0
S	**Expenses**		17	17	Project expenses related to travel, fleet, etc.	0	3	3	3	3	3	2	$17
	Column Totals	**763**	**234**	**997**	Quarterly Subtotals	226	125	219	136	133	102	56	$997
	CADD	**54**		**54**	CADD	2	11	10	14	12	5	0	$54
	Miscellaneous & Contingency	**21**		**21**	Miscellaneous & Contingency	0	0	1	3	3	5	6	$21
					Quarterly Subtotals	231	**136**	**230**	**153**	**148**	**112**	**62**	**$1,072**
	TOTAL	**$838**	**$234**	**$1,072**									
					Cumulative Subtotals		**$367**	**$597**	**$750**	**$898**	**$1,010**	**$1,072**	

FUNDING SUMMARY			$1,072,000	Total
Federal Funds	$536,000		$536,000	
Non-federal In-kind Services		$234,000	$234,000	
Non-federal Cash	$302,000		$302,000	

* In-kind data comes from the "DNR Detail" spreadsheet.

Assumptions:

1. Two year study (with optimal funding)
2. DNR in-kind estimate based on aggregated average daily cost of $650 per day. Actual value for in-kind credit will be based on official DNR accounting.

Marsh Lake Aquatic Ecosystem Restoration
Feasibility Study Cost Estimate
August 2009

DNR Detail

$650 Estimated DNR daily cost

	Task Description	Corps***	DNR $ Costs** Distributed	DNR $ Costs** Cost	DNR DAYS*	Notes:	Estimated Person-days: Wildlife	Fisheries	Eco	L&M/Eng	Waters	Regional Admin
A	**Public Involvement**		**$9**	**$9**	**14**	Public meetings, newsletters, etc.	4	2	2		2	4
	Public Meetings (arrange and facilitate)		$4			Assume 2 meetings: scoping and draft review						
	Prepare record of comments		$2			0						
	News releases and Newsletters		$3			0						
	Corps participation at meetings					Assume included in numbers below						
						0						
B	**Institutional Studies**	**$5**		**$0**	**0**	Project history, intergovernmental relations. Determine appropriate program/cost-sharing policy.						
						0						
C	**Social Studies**		**$7**	**$7**	**10**	Recreation, etc.	7	2	1			
	Conduct recreation needs analyses		$5			0						
	Draft report sections for recreation		$2			0						
						0						
D	**Cultural Studies**	**$5**	**$16**	**$16**	**25**	Cultural resources survey, coordination						25
	Corps admin and report writing	$5				Admin, analysis, coordination with SHPO						
	Field surveys		$16			To be done by DNR staff archaeologists						
						0						
						0						
E	**Environmental Studies**	**$97**	**$52**	**$52**	**80**	Environmental design and NEPA process	20	6	54			
	GIS products for EA	$6	$4			0						
	Write EA, Feas report, ops plan & appendix	$55				0						
	Coordination & meetings	$16				0						
	Sediment testing	$20				Contracted						
	(DNR) Inventory existing conditions		$20			Gather existing info, collect data if needed						
	(DNR) Forecast future with- and without-project		$18			DNR lead team discussion and modeling						
	(DNR) Write draft report sections		$10			Describe existing, future-without and future with-project conditions for Feasibility report						
						0						
						0						
F	**Fish and Wildlife**	**$5**		**$0**	**0**	Coordination Act Requirements W/FWS						
						0						
G	**Economic Studies**	**$15**		**$0**	**0**	Recreation benefits, economic justification, incremental cost analysis						
						0						
H	**Surveying and Mapping**	**$5**	**$20**	**$20**	**31**	Topography, cross sections, soundings	1	2		28		
	Coordination and admin		$3			0						
	Pomme de Terre River cross sections		$4			Most done December 2006. Re-do portions originally out of tolerance.						
	Embankment cross sections					Done December 2006						
	Outlet structures and site topography					Done December 2006						
	Soundings/bathymetry near outlet		$3			Most done Dec 2006 except u.s. soundings						
	Reducing/plotting/mapping		$10			Office caculations						
	Corps coordination	$5				0						
						0						
J	**Hydrology and Hydraulics**	**$84**	**$42**	**$42**	**65**	Hydraulic design of channel and dam mods	17	17	20	4	7	
	(Corps) Hydrology	$12	$2			Marsh lake and PdT discharge/duration history						
	(Corps) Pomme de Terre RAS modeling	$30	$2			Existing and proposed conditions						
	(Corps) Pomme de Terre Geomorphology	$6	$2			Rosgen classification, field inspections						
	(Corps) Fish Passage (1-D modeling)		$2			0						
	(Corps) Scour protection	$9	$2			Wave protection and stream erosion protection						
	(Corps) Feasibility appendix, coord & GIS	$27	$2			0						
	(DNR) Determine goals, objectives, constraints		$6			DNR lead team discussion						
	(DNR) Hydrology		$5			DNR participate and review						
	(DNR) Pomme de Terre Geomorphology		$4			DNR field inspections with Corps						
	(DNR) Fish Passage		$3			DNR assist design, review models						
	(DNR) Develop operation plans for alternatives		$11			DNR lead team discussion and modeling						

	(DNR) Review H&H appendix		$1			0							
						0							
K	**Foundations and Materials**	**$138**	**$3**	**$3**	**4**	Geotechnical design	1	1	1	1			
	Review existing data	$6	$1			0							
	Borings and testing	$60	$1			Contracted							
	Assess stability/ geotechnical design	$60	$1			0							
	Feasibility report appendix	$12				0							
						0							
M	**Designs and Cost Estimates**	**$181**	**$20**	**$20**	**30**	Structural and layout issues, construction cost estimates	9	9	6	4	2		
						0							
	Structural design					All designs to feasibility level of detail.							
	PdT diversion and road bridge	$8	$2			0							
	Emergency spillway new operable structure	$12	$2			0							
	Existing spillway modifications	$5	$2			0							
	Pedestrian/bike bridge	$6	$1			To accommodate future bike trail							
	Feasibility appendix and coord	$18	$2			0							
	Fishways		$3										
	Fish Pond Mods (Inlet and Outlet)		$1										
	Lewisberg Road Culverts		$3										
						0							
	Mechanical design	$6				0							
						0							
	General engineering/layout					0							
	Site plans, typical sections, layout	$84	$2			0							
	Quantity calculations	$12	$2			0							
						0							
	Cost estimates	$30				Establish alternative costs and final baseline cost for authorization							
						0							
N	**Real Estate Studies**	**$10**	**$3**	**$3**	**5**	Project site, borrow and disposal areas	2	1	1	1			
	Corps staff activities	$10				Real Estate Plan and appraisals							
	DNR staff activities		$3			Assist with local knowledge							
						0							
P	**Study Management**	**$92**	**$16**	**$16**	**25**	Administration, cost tracking, coordination	14	4	4	1	1	1	
	General coordination	$52				Includes Executive Committee time							
	Study funds control	$38				0							
	Project Cooperation Agreement for construction	$2				0							
	DNR in-kind for study management		$16			Includes Executive Committee time							
						0							
Q	**Plan Formulation**	**$74**	**$13**	**$13**	**20**	Developing and assessing alternatives, milestone meetings, ITR review	5	5	5	2	2	1	
	Corps PM guide early planning tasks	$2				0							
	Preliminary formulation & screening	$2				0							
	Feasibility Scoping Meeting	$2				0							
	Alternative Formulation Briefing	$6				0							
	CWRB meeting (in Washington, D.C.)	$12				0							
	Independent Technical Review (ongoing) & VE	$50				Performed by another MVD District							
	Value Engineering Study (in-kind participation)		$6			Assume 3 people for 3 days							
	DNR in-kind attendance at milestone meetings		$7			Feasibility Scoping Meeting, AFB & CWRB							
						0							
R	**Report Preparation**	**$52**	**$16**	**$16**	**25**	Prepare draft and final reports of findings	5	5	5	5	5		
	Without-project analysis	$5				0							
	Feasibility scoping meeting documents	$8				0							
	Alternative analysis for AFB meeting	$21				0							
	Draft report for public review & CWRB	$12				0							
	(DNR) review draft reports		$16			Assume 2 rounds of review							
	Final report	$6				0							
						0							
S	**Expenses**		$17	$17		Project expenses related to travel, fleet, etc.							
	Column Totals	**$763**	**$234**	**$234**	**334**	(Actual estimated person-days)	**85**	**54**	**99**	**46**	**19**	**31**	
					360.0	(Re-calculated person-days after rounding $)							

* DNR DAYS column contains the DNR's estimated man-days
** Estimated cost ($Thousands) is calculated based on DNR's estimated man-day cost and distributed to tasks by Corps' PM.
*** Data in the "Corps" column comes from the "Corps Detail" spreadsheet