DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MN 55101-1678

Regional Planning and Environment Division North

FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act of 1969, the St. Paul District, Corps of Engineers has prepared a Supplemental Environmental Assessment (SEA) for modifications under consideration as part of the following proposed project:

Marsh Lake Ecosystem Restoration Project
Minnesota River - Lac qui Parle and Swift Counties, Minnesota

The intent of this project is to provide ecosystem restoration to Marsh Lake, a part of the Lac qui Parle reservoir in Big Stone, Lac qui Parle, and Swift Counties, Minnesota. This SEA involves proposed feature modifications identified during the Pre-Construction, Engineering, and Design Phase. These modifications include re-routing the Marsh Lake Dam access road, removing part of the original road, and constructing a sluice-gated water control structure west of the existing emergency spillway.

This Finding of No Significant Impact (FONSI) is based on the following factors: the proposed modifications (and the project as modified) would have no adverse impacts on fish and wildlife resources, Federally-listed threatened or endangered species, and would have only short-term minor negative impacts on the social environment, State-listed threatened or endangered species, and air quality. The proposed modifications (and the project as modified) would substantially benefit wetland habitat, habitat diversity and interspersion, biological productivity and surface water quality and have minor benefits to recreation, public health and safety, and public facilities and services. Continued coordination, particularly regarding cultural resources, would be maintained with appropriate State and Federal agencies.

For the reasons stated above, neither the proposed modifications, nor the project as modified, constitute a major Federal action significantly affecting the quality of the environment. Therefore, an environmental impact statement will not be prepared.

29 APR 16
Date

Daniel C. Koprowski
Colonel, Corps of Engineers
District Engineer

CEMVP-PD-C

April 28, 2016

SUBJECT: Supplemental Environmental Assessment for the Marsh Lake Ecosystem Restoration Project, Lac qui Parle and Swift Counties, Minnesota

1. The public review period for the draft supplemental environmental assessment for the subject project expired on 1 June 2015. Several letters in support of the project were received and no significant issues were raised during the review period.

2. The Minnesota Department of Natural Resources is currently developing an Environmental Assessment Worksheet (EAW) and Record of Decision (ROD). We anticipate this will be completed within 4 months.

3. The public review period for the draft revised Clean Water Act 404(b)(1) evaluation for the subject project expired on 28 March 2016. No substantive issues were raised during the review period. Included for your signature is the Findings of Compliance. The Minnesota Pollution Control Agency cannot issue Clean Water Act Section 401 Water Quality certification until the EAW and ROD have been finalized. However, they anticipate no major issues for the project as currently designed and with in-water Best Management Practices.

4. The Finding of No Significant Impact (FONSI) is enclosed for your signature. There are no outstanding issues on this project, and I recommend the FONSI be signed at this time.

Terry J. Birkenstock
Deputy Chief, Regional Planning &
Environmental Division North

Encls

Bauer PA
Potter PD-C
Stefanik PD-C
Birkenstock PD
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DesHarnais DPM
Toth DDE
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File name: Marsh_Lake_Supplemental_EA_and_404 Final

Supplemental Environmental Assessment &

Finding of No Significant Impact

Marsh Lake Ecosystem Restoration Project

Minnesota River - Lac qui Parle and Swift Counties, Minnesota

Photo by Ron Bolduan

US Army Corps of Engineers ®

St. Paul District

APRIL 2016

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APRIL 2016

1.0 PURPOSE, NEED, AND AUTHORITY FOR PROPOSED ACTION

1.1 Introduction

The U.S. Army Corps of Engineers (USACE), St. Paul District (Corps) has prepared this Supplemental Environmental Assessment (SEA) to evaluate the potential impacts associated with proposed modifications to the Marsh Lake Ecosystem Restoration Project (Project; Appendix A - Figure 1). This SEA supplements the document entitled: *Feasibility Report and Environmental Assessment, Marsh Lake Ecosystem Restoration Project, Minnesota River – Big Stone, Lac qui Parle, and Swift Counties, Minnesota,* November 2011 (Feasibility Report/EA). The 2011 Feasibility Report/EA disclosed the potential environmental impacts for the Marsh Lake Ecosystem Restoration Project that sought to return the Marsh Lake area ecosystem to a less degraded and more natural and functional condition. A Finding of No Significant Impact (FONSI) was signed on 6 January 2012. These NEPA documents are hereby incorporated by reference into this document.

The purpose and scope of this SEA are limited to evaluating the potential environmental effects of recent proposed modifications that are not covered in the 2011 Feasibility Report/EA. A full and complete description pertaining to the potential impacts of the Project features that are unchanged is provided in the 2011 Feasibility Report/EA, and therefore will not be discussed in this SEA.

In the 2011 Feasibility Report/EA, a wide range of alternative measures were identified and evaluated. Major components of the recommended plan consisted of the following:

- Restore the Pomme de Terre (PdT) River to its historic channel;
- Breach dike at abandoned fish pond;
- Construct drawdown structure;
- Construct Louisburg Grade Road gated culverts; and,
- Modify the Marsh Lake Dam by adding a fishway.

Additional details on the recommended plan and associated features are described in Section 7 of the 2011 Feasibility Report/EA.

In October 2014, a Value Based Design (VBD) charrette held by the Corps examined ways to reduce the overall cost and/or increase the value of recommended plan (USACE 2015). In addition, the most recent refinement of the cost estimate for proposed features showed costs exceeding that of the authorized

limit; thus proposed features have been further modified or eliminated (Appendix A - Figure 2). For purposed of this SEA, the proposed action is identified as implementation of all the identified modifications, which are described in Section 3 below.

This assessment fulfills the requirements of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality regulations (40 CFR 1500-1508), and Corps of Engineers regulations (Engineer Regulation (ER) 200-2-2).

1.2 Authority

The Marsh Lake Feasibility Study was authorized by a Resolution of the Committee on Public Works on the U.S. House of Representatives, May 10, 1962. The need for action is based on a reconnaissance study completed in December 2004 (USACE 2004) and approved by the Corps Mississippi Valley Division in January 2005. Additional details on authority for the study are provided in Section 1.2 of the 2011 Feasibility Report/EA. The Marsh Lake Ecosystem Restoration project was authorized for construction in the Water Resources Reform and Development Act of 2014 (PL 113-121), Section 7002(5), note 4.

2.0 PURPOSE AND NEED

The purpose of the proposed modifications is to reduce project costs and increase the value while meeting the original goal of restoring the aquatic and riparian ecosystem in the Marsh Lake project area. The objectives of the project are: 1) reduce sediment loading to Marsh Lake, 2) restore natural hydrologic fluctuations to Marsh Lake, 3) restore geomorphic and floodplain processes to the PdT River, 4) reduce sediment resuspension in Marsh Lake, 5) increase emergent and submergent aquatic plants in Marsh Lake, 6) increase waterfowl and native fish habitat, 7) restore aquatic habitat connectivity between Marsh Lake, the PdT River, and Lac Qui Parle, and 8) reduce aquatic invasive fish in Marsh Lake. Additional details on the purpose and need are provided in Section 1 of the 2011 Feasibility Report/EA.

3.0 DESCRIPTION OF THE PROPOSED MODIFICATIONS AND NO ACTION ALTERNATIVES

3.1 Proposed Modifications

The proposed modifications are summarized and identified by number in Table 1. More details follow for individual modifications which are numbered and proceeded by the letter ‘M’ (modification). Construction of all project features is anticipated to last 2 to 3 years, beginning as early as fall of 2016.

Table 1. Comparison of original and modified features for the Project.

Original Feature	Proposed Modified Feature (M)	Rationale for Modification
Water control structure with 10 bays using stoplogs, located at the existing emergency spillway	Water control structure with 6 bays using sluice gates, located southwest of existing emergency spillway, maintenance ramp (M1)	Reduce construction and operations/ maintenance costs; increase public safety
Rockramp fishway at 4% slope	Enlarged rockramp fishway at 3% slope (M2)	Increase fish passage performance
Pedestrian bridge across the fishway and drawdown structure	Foundations for a pedestrian / bicycle trail across the fishway and emergency spillway, to which bridges could be added; decking across drawdown structure to also serve as a pedestrian bridge (M3)	Reduce construction costs; maintain option for a future bicycle trail
Breach dike at abandoned fish pond	Do not breach dike at abandoned fish pond (M4)	Reduce construction costs
Replace 3 sets of culvert crossings at Louisburg Road with gated culverts	Do not replace culverts at Louisburg Road (M5)	Reduce construction costs
Gated entrance on west side maintained	Gated entrance on west side open to public seasonally; parking lot added (M6)	Increase recreation opportunities
Borrow site in agriculture field north of existing embankment road	Additional sources of borrow material from the existing dam embankment (to be removed) and alternative borrow site (M7)	Reduce construction costs; maximize utilization of materials from embankment removal
Improvements for Marsh Lake Dam Day Use Facility; a PdT River canoe launching/landing point, Marsh Lake to Minnesota River portage, fishing platforms, & additional recreational facilities.	Maintain existing recreation features at Marsh Lake Dam Day Use Facility but do not add additional recreation features (M8)	Reduce construction costs; focus on restoration features
PdT River restoration to its historic channel through the existing dam embankment/road along 100th Street SW; road traffic conveyed with a 400-ft long bridge	Rerouting dam embankment/road along 255th Ave SW and through agricultural field and across the PdT river; eliminate the need for a bridge and remove the old embankment/road (M9)	Reduced construction and maintenance costs associated with bridge; increase floodplain forest benefits
Re-route lower PdT River to its historic channel and stabilized with rip-rap	Re-route lower PdT River slightly modified from historic channel and stabilize with riffle structures and natural stabilization methods (M10)	Reduce construction costs & enhance riverine habitat

3.1.1 Change location and type of water control/drawdown structure (M1)

This proposed modification would move the location of the water control/drawdown structure from the emergency spillway to an area just southwest of the spillway (Appendix A - Figure 3 to Figure 6). This new site would remain aligned with the existing dam embankments. The structure would consist of upstream retaining walls, the control structure, and downstream wing walls (Appendix A - Figure 4 to Figure 6). The control structure would be approximately 113 ft wide, 82 ft long, and 18 ft high with sluice walls that are 2 ft wide and 14.5 ft high. There would be six bays separated by five 1.75 ft thick by 26 ft long concrete piers evenly spaced across the spillway. Between piers, there would be two 5 ft x 6 ft openings for sluice gates in each sluice wall section. Sluice gates would have a top elevation of 940 ft and a bottom sill elevation of 934.6 ft (NGVD88). A sheetpile cutoff, 5 ft high, would be constructed underneath the structure to prevent undermining.

The water control structure would be independent of the existing emergency spillway, which would remain unaltered. In addition, the new drawdown structure would use sluice gates instead of stop logs to control flow, which would have less maintenance costs. More importantly, this would minimize the dangerous hydraulic roller conditions that are common with straight-drop structures. This modification would enhance public safety and reduce operations and maintenance costs.

Associated with this feature, there would be a maintenance access ramp constructed extending from the embankment into Marsh Lake (Appendix A - Figure 7). The ramp would allow equipment access to the water control structure that may be needed for removal of dredge material.

The water control structure would require a series of temporary coffer dams to be constructed on the lake-side of the dam to allow for proper site preparation and casting-in-place concrete construction under dry conditions (Appendix A - Figure 8). Operation of the sluice gates and controlled natural head cutting would provide the needed inlet channel.

Once this feature is constructed, it would be operated by the Minnesota Department of Natural Resources (MNDNR) to control water levels in order to meet project objectives in Marsh Lake. A draft Operations Plan (Standing Instructions) has been developed describing how the new control structure will be operated with consideration to pertinent features affecting flows and water surface elevations in Marsh Lake (i.e., emergency spillway, rockramp fishway and embankments (USACE and MNDNR 2016).

3.1.2 Reduce slope for the rock-ramp fishway (M2)

This modification would involve enlarging the rockramp fishway at a more gradual 3% slope using natural stone with a wider sizing variability (Appendix A - Figure 9 to Figure 10). The existing dam structure would have a 30 ft-wide notch at the top of the fishway with a bottom elevation of 936.1 ft and top elevation of 938.1 ft (Appendix A - Figure 11). The configuration of the boulder-weirs would remain essentially unchanged although they would be spaced further apart horizontally. Minor adjustments to the rock riffles would be done after the post-construction flows have been stabilized. Overall the fishway length would increase by about 60 feet over that of the original design. Temporary

coffer dams upstream and downstream of the fishway would be required to construct this feature (Appendix A - Figure 10).

Although this modification would add to the cost, it would enhance performance as demonstrated at other projects (Aadland 2010). The decreased slope would reduce velocities, thus enhancing fish passage for a variety of species and life stages. Also, the use of natural stone would enhance the aesthetic appeal and is a more cost effective alternative.

3.1.3 Provisions for a bicycle trail (M3)

This project modification would ensure that features are compatible with the future construction of a state bicycle trail by the MNDNR's Parks and Trails Department at the dam. A 97-ft long by 23-ft wide deck would be constructed over the water control structure with a top elevation of 950.6 ft, which is necessary for operating the sluice gates (Appendix A - Figure 6). This would also act as a pedestrian bridge. However, an additional pedestrian/bike bridge would be needed over the existing emergency overflow spillway (Appendix A - Figure 12) and fishway (Appendix A - Figure 13) to allow for future pedestrian/bike traffic from one side of the river to the other as part of the Minnesota River State Trail, which is not available now. For this reason, the footings for crossings would be constructed as part of these features. The abutments would be built to a top elevation of 950.6 ft.

The state trail itself and bridges would be constructed as project betterments by the MNDNR's Parks and Trails Department, contingent upon funding. This modification would keep project costs down while maintaining the future option of adding a trail.

3.1.4 No breach of abandoned fish pond (M4)

This original project feature involved breaching the dike at one or more locations on the abandoned fish pond downstream of the embankment. However, MNDNR has recently indicated their lack of support for this measure as the area would likely become inhabited by carp, thus affecting water quality in the pond. The pond is currently fishless and has relatively low turbidity. This modification would result in a minor cost savings. Associated with this modification, the existing valve house, control valves, and piping previously used for the pond would be removed or permanently deactivated. Voids left by this removal would be grouted or backfilled with compacted impervious fill.

3.1.5 No culverts replaced at Louisburg Road (M5)

This modification would keep the existing three sets of culverts at Louisburg Road instead of replacing them with box culverts capable of water control. The reason for this is to save on construction costs.

3.1.6 Public access on west side (M6)

This modification would allow seasonal public access from the west side of the dam and a turnaround parking lot (Appendix A - Figure 14). The parking lot would be 180 ft long by 84 ft wide. The existing 12-ft wide maintenance road on top of the embankment would be improved to facilitate connective access through the embankment. This site is currently closed with a gate, but would be open during high

demand periods, such as open water fishing season. This modification would enhance the value of the project.

3.1.7 Borrow sites (M7)

Borrow material would be used for the new embankment and cutoff dike construction. Borrow would be acquired from a 10-acre designated borrow area in the agricultural field crossed by the new dam embankment/roadway between Embankments A and B and/or removal of a portion of existing dam embankment (Appendix A - Figure 2 and Figure 15). This modification would reduce project costs and maximize utilization of materials removed from the old embankment road.

3.1.8 Maintain existing recreation features at the Day Use Facility (M8)

This modification would maintain the existing recreation features at the Marsh Lake Dam Day Use Facility instead of making improvements. The reason for this modification is to save cost and to maintain the focus on ecosystem restoration.

3.1.9 Re-Route the Dam Access Road/Embankment (M9)

Re-routing the access road would eliminate the need for a 400-ft long low-clearance bridge for vehicles, resulting in a significant savings in construction costs as well as eliminating the need for any bridge operations and maintenance. The connectivity between the PdT River and its floodplain would be enhanced and is described in more detail in Section 5.

A portion of the dam access road/embankment would be re-routed compared to the plan in the 2011 Feasibility Report/EA, which follows 100th Street SW and adds a 400-ft long bridge (Appendix A - Figure 2). The re-routed alignment would go to the north/northeast and follow 255th Avenue SW south, then turn southeast across an agriculture field owned by the MNDNR and across the existing PdT River diversion channel where it would tie into the existing dam embankment and roadway (Appendix A - Figure 16). The relocation would consist of approximately 5,350 linear feet of embankment/roadway built to an elevation between 953.5 and 954.7 ft with a top width matching the existing roadway (i.e., 26 ft). The new roadway would allow for two 10-ft travel lanes and 3 ft wide shoulders. Where ditching is needed, the ditches would be 3-ft wide bottom width with 1V:3H backslopes. Two seepage cutoff areas or embankments constructed with impervious material would be needed. Embankment A would assist in rerouting the PdT River to its historic channel (Appendix A- Figure 17). Embankment B would be part of the new alignment allowing vehicular access to the dam (Appendix A - Figure 18). The new road/embankment would serve as the new dam face and would not allow any flow through it (there are existing culverts at the Embankment B site that connects Marsh Lake to a 13-acre backwater). To construct these embankments under dry conditions, a series of temporary coffer dams would be needed (Appendix A – Figure 19 and Figure 20).

The existing dam embankment from the historic PdT River channel east to 240th Avenue SW would have the road core removed down to match the elevation of the adjacent ground to allow connectivity

between the river and its floodplain. A layer of topsoil would be added and seeded. An existing fiber optic cable located on this section of the road would need to be relocated. An 84 ft x 24 ft parking lot would be constructed on the east side (Appendix A - Figure 21).

Associated with this work, a 600-ft long portion of 255th Avenue that accesses Marsh Lake would be deconstructed and restored to natural conditions with topsoil, mulch, and prairie seed mix (Appendix A - Figure 18). However, a new access spur road would be constructed that joins the embankment road where it curves and heads southeast.

3.1.10 Re-route Pomme de Terre River to historic channel (M10)

This project modification would involve re-routing the lower PdT River into its historic channel using a slightly different alignment from the 2011 design (Appendix A - Figure 22 to Figure 25). Also, this modification proposes two grade control structures in the form of riffles located upstream of the abandoned embankment road, between 2 and 2.5 miles upstream of the confluence with Lac qui Parle. Riffles would act to reduce stream velocities and control grade, would cross the entire width of the channel, and be constructed of rock so as provide a natural appearance (Appendix A - Figure 26). The modified alignment and use of riffles is based on recent survey information. The new alignment would decrease the likelihood of the river to deviate from the historic channel.

This modification would also use natural bank stabilization techniques instead of rip-rap for the PdT River channel work. The initial project design in the 2011 Feasibility Report/EA did not include bank stabilization features along the PdT River or the embankment. However, it is now recognized that bank stabilization features may be necessary as part of restoring the PdT River to its historic channel in order to control where flow enters Lac qui Parle and to protect existing infrastructure (i.e., the Marsh Lake Dam embankment). The traditional method for bank stabilization is rip-rap. However, bioengineered alternatives using a more naturalized approach would be used instead of rip-rap. The approach identified for the PdT River is toe wood-sod mats (Appendix A - Figure 27). Approximately 1,000 linear feet of the river would be protected with this technique. Up to seven plugs would also be constructed at key points of the river where high flows threaten to breach the bank into a remnant channel. Plugs would be based on the toe wood sod mat design.

Unlike the 2011 design, portions of the abandoned PdT River would need to be excavated to pass flows, including a breach of the dam access road. Also portions of the floodplain would be excavated to serve as the new river channel.

The rationale for this modification is that it has been shown to cost less than traditional bank armoring and would increase the aesthetic appearance.

3.2 No Action Alternative

The no action alternative for each modification is the recommended plan as identified in the 2011 Feasibility Report/EA. For M1, access to the dam would be via the current road alignment that follows

100th Street SW. Public access to the west side would be remain restricted. Additional details are provided in Section 7 of the 2011 Feasibility Report/EA. This alternative would meet the project purpose and need, however, project features would result in higher cost and/or less value added.

4.0 AFFECTED ENVIRONMENT

Section 2 of the 2011 Feasibility Report/EA contains a description of the affected environment (existing conditions and future without-project conditions) that requires little supplementation for the proposed modifications. Supplemental narrative is provided below only in the cases where aspects of existing resources would be uniquely affected by the proposed modifications.

4.1 Social and economic conditions

Section 2.9.9 of the 2011 Feasibility Report/EA discusses recreation activities in the project area as of 2011. At the time, there was mention of the potential for integrating the Marsh Lake area into a broad regional network of trails linking natural areas, recreational opportunities, and educational amenities. The MNDNR has identified two alternatives: a corridor following a remnant of the original road/embankment ("Southern Route") or following the new road/embankment ("Northern Route"). Preliminary estimates for these alternatives indicated a slightly higher cost with the Southern Route, primarily associated with a dike breach bridge.

4.2 Historic and Cultural Resources

Section 2.7 of the 2011 Feasibility Report/EA discusses historic and cultural resources in the project area.

4.3 Natural Resources

Section 2.8 of the 2011 Feasibility Report/EA discusses natural resources in the project area.

4.3.1 Land Use and Land Cover

Land use and land cover resources directly affected by proposed Project modifications are limited to areas associated with the dam access road realignment, the water control/drawdown structure, enlarged rockramp fishway, abandoned fishpond, west parking lot, and re-routed lower PdT River. Land use/land cover types that would be affected are generally composed of agriculture/croplands, emergent wetland vegetation, open water (lake), grasslands/shrub, floodplain forest, and river.

The Hastad, Hegland, and Plover Waterfowl Production Areas (WPAs) are within the project area. Several private land tracts held under Conservation and Wetland Easement by the U.S. Fish and Wildlife Service (USFWS) are also within the project area.

4.3.2 Endangered and Threatened Species

Section 2.8.10 of the 2011 Feasibility Report/EA identified no federally-listed endangered and threatened species in the project area as of 2011. An updated species list provided by USFWS's Information, Planning, and Conservation System (IPAC) indicates two species may be found in the project area: Dakota skipper (*Hesperia dacotae*, threatened) and northern long-eared bat (*Myotis septentrionalis*, threatened) (Appendix B). However, none of these or their critical habitat are anticipated to be affected by the proposed project as described below.

The Dakota skipper is a butterfly that requires two types of high-quality native prairie habitat. The first is relatively flat and moist native bluestem prairie in which three species of wildflowers are usually present and in flower when Dakota skippers are in their adult stage - wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zigadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats and three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple and upright coneflowers and blanketflower. The affected project area does not contain high-quality native prairie.

Northern long-eared bats may be found in the vicinity of the project area from late spring until early fall. The bats spend winter hibernating in caves and mines. They may roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Trees fitting this description would be removed as part of this project. However, there are no known roost trees or hibernacula for Northern long-eared bats in the project area. Also, the project location is currently outside the buffer zone for White Nose Syndrome designated for USFWS's 4(d) rule[1].

Two state-listed mussel species found in the lower PdT River are elktoe (*Alasmidonta marginata*, threatened) and black sandshell (*Ligumia recta*, special concern). This includes that portion of the river channel that would be abandoned as part of re-establishing the PdT River into its historic channel. The Minnesota Department of Natural Resources has indicated plans to relocate mussels from the abandoned reach to the Minnesota River immediately prior to project construction (Mike Davis, pers. comm. 2016).

4.3.3 Contaminants, Hazardous, and Toxic and Radioactive Wastes

Section 2.8.11 and Appendix F of the 2011 Feasibility Report/EA report did not identify any issues with regards to contaminants, hazardous, and toxic and radioactive wastes (HTRW) in the project area as of 2011. A Phase I Environmental Site Assessment involving a search of databases, search of map and aerial photography, and a site inspection indicated there are no environmental risks associated with the

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSBuffer.pdf.

project site (Appendix C). The Corps would not use any material for project features that are determined unsuitable.

5.0 ENVIRONMENTAL EFFECTS

The environmental impacts for the proposed modifications in comparison to the no action alternative (i.e., the Proposed Project as identified in the 2011 Feasibility Report/EA) are discussed below and are summarized in Table 2. Headers follow that of the format identified in the 2011 Feasibility Report/EA. Categories of impacts for which there is no effect from the proposed modifications are not addressed.

5.1 Social and Economic Resources

5.1.1 Noise levels

The proposed modifications would result in temporary increases in noise levels as additional construction activities with heavy equipment would be required.

5.1.2 Aesthetic values

The proposed modifications would increase the long-term resource value and aesthetic appeal of the area from that of the original design. Rerouting the dam embankment/road and removing a portion of the existing embankment/road would eliminate automobile traffic along a one-mile reach of the PdT floodplain. Removing the road core would enhance lateral connectivity of the river to its floodplain and promote floodplain forest. The use of natural bank stabilization materials instead of rip-rap would enhance the visual appearance along sections of the lower PdT River.

There would be temporary additional impacts to aesthetics associated with the road re-route, enlarged fishway, and relocating the water control structure. These modifications would have a larger disturbance footprint during construction that would affect the aesthetic appeal of the localized area.

5.1.3 Recreational opportunities

The effects of the proposed modifications on recreational opportunities in comparison to the no action alternative would be mixed. Recreational opportunities at the Marsh Lake Dam Day Use Site would be decreased as these facilities would be maintained but not enhanced. There would be no canoe launching/landing point, Marsh Lake to Minnesota River portage, fishing platforms, or canoe ramp at the PdT River as was contemplated in the 2011 Feasibility Report/EA. However, recreation opportunities would be enhanced as visitors to Marsh Lake Dam would have seasonal access from the west side as well as the corresponding parking lot. The use of natural bank stabilization and riffle structures on the PdT River habitat would benefit macroinvertebrate populations, likely increasing fish populations and angling opportunities.

Table 2. Environmental Impact Assessment Matrix of Proposed Modifications Relative to the Original Project.

	Proposed Alternative						
	BENEFICIAL				ADVERSE		
PARAMETER	SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT
A. SOCIAL EFFECTS							
1. Noise Levels					T		
2. Aesthetic Values			X		T		
3. Recreational Opportunities				+/-			
4. Transportation				+/-			
5. Public Health and Safety		X					
6. Community Cohesion				X			
7. Community Growth and Development				X			
8. Business and Home Relocations				X			
9. Existing/Potential Land Use				X			
10. Controversy				X			
B. ECONOMIC EFFECTS							
1. Property Values				X			
2. Tax Revenue				X			
3. Public Facilities and Services			X				
4. Regional Growth				X			
5. Employment				X			
6. Business Activity				X			
7. Farmland/Food Supply				X			
8. Commercial Navigation				X			
9. Flooding Effects				X			
10. Energy Needs and Resources				X			
C. NATURAL RESOURCE EFFECTS							
1. Air Quality					T		
2. Terrestrial Habitat				+/-			
3. Wetlands				+/-			
4. Aquatic Habitat				+/-			
5. Habitat Diversity and Interspersion				+/-			
6. Biological Productivity			X		T		
7. Surface Water Quality			X		T		
8. Water Supply				X			
9. Groundwater				X			
10. Soils				X			
11. Threatened or Endangered Species				X			
D. CULTURAL RESOURCE EFFECTS							
1. Historic Architectural Values				X			
2. Prehistoric & Historic Archeological				X			

Key: X = Level of Effect; +/- = combined beneficial and adverse effects; T = temporary effects.

The Hastad, Hegland, and Plover Waterfowl Production Areas (WPAs) as well as the private land tracts under jurisdiction by the USFWS are sources of recreation surrounding waterfowl. These WPAs would not be adversely affected by the project.

5.1.4 Transportation

The proposed modifications would adversely affect transportation due to the increased distances that visitors would have to travel to access the Day Use facility. Adding a mile of road would also require additional operation and maintenance (O&M) costs.

During high flow events when the PdT River overtops its banks, two railroad crossings downstream of the PdT River potentially could be subject to increased flow and velocities through the bridge structures (Appendix G).

5.1.5 Public health and safety

The proposed modifications would substantially improve public health and safety. By re-routing the dam access road, canoeists on the PdT River would no longer need to navigate under a low-clearance bridge, which may be problematic during high flow events. Changing the configuration of the drawdown structure from a stop log to sluice gate operation would lessen the risk associated with hydraulic rollers. However, by re-routing the dam access road, visitors commuting from the nearest city (Appleton, MN) would have to drive about a mile further to get to the Marsh Lake dam. This would also apply to bicyclists if the bicycle trail follows this same alignment.

5.2 Historic and Cultural Resources

Modifications involving the water control structure would adversely affect the appearance of the Marsh Lake Dam, which has been determined individually eligible to the National Register of Historic Places. Therefore, Phase III mitigation documentation of the Marsh Lake Dam using Level II documentation as described in the Minnesota Historic Property Record Guidelines was completed.

Phase I and Phase II cultural resources surveys were completed at the preferred and alternate borrow areas. Investigations at the preferred borrow site determined that the pre-contact artifact scatter (21SW27) is not eligible for listing on the NRHP as the site lacks integrity. Two archaeological sites (21SW65 and 21SW66) were identified at the alternate borrow area and they will be avoided. The Corps has determined that the Project will have no adverse effect to historic properties which the Minnesota State Historic Preservation Office (SHPO) has agreed with (Appendix D).

A Memorandum of Agreement between the Corps and the MNSHPO has been executed describing mitigation measures and cultural resource investigations for the project (USACE and MNSHPO 2010).

5.3 Natural Resources

5.3.1 Air quality

The proposed modifications would result in temporary impacts to local air quality as additional construction activities with heavy equipment powered by fossil fuels would be required. The proposed alternative has been reviewed for potential impacts of project-generated greenhouse gas emissions and their effect on climate change.

Greenhouse gas emissions and their effect on climate change are global issues resulting from numerous and varied sources, with each source making a relatively small addition to global atmospheric greenhouse gas concentrations. Additionally, the ability to accurately predict the localized or short-term effects of changes in greenhouse gas emissions is extremely limited. Nevertheless, it is imperative for agencies to identify the potential emissions from project alternatives when it may inform the agency's decision-making.

The proposed modifications would be expected to produce greenhouse gasses during project activities in the form of exhaust from various types of machinery used for material transport and material placement. The Council on Environmental Quality (CEQ) revised draft NEPA guidance for consideration of the effects of climate change and greenhouse gas emissions in December, 2014 (http://go.usa.gov/3KEyR). The guidance proposed a level of 25,000 metric tons or more of CO2-equivalent GHG emissions annually as an indicator that detailed assessment of greenhouse gasses may be meaningful to decision makers and the public. Using reported figures amount of diesel fuel consumed per cubic yard of material, it was estimated that excavation and fill of about 800,000 cubic yards of material would result in the release of about 600 metric tons of CO2-equivalent greenhouse gas emissions. Therefore, based on the CEQ guidance cited above, a detailed analysis of greenhouse gas emissions is not required, and has not been prepared for the proposed alternative.

5.3.2 Land Use and Land Cover

Existing land use and land cover types directly affected by project modifications (i.e., in addition to what is reported in the 2011 Feasibility Report/EA) would include about 53 acres of agriculture/croplands, pasture and hay, emergent wetland vegetation, lake/open water, grassland/shrub, floodplain forest, and river (Table 3). If these modifications are implemented, the existing land use/land cover would be displaced with another cover type. Within the footprint of modified features, there would be net gains in river and floodplain forest, and net losses in agriculture, lake, emergent wetlands and grasslands/shrubs cover types.

Table 3. Acreages of cover types under the existing conditions and proposed modifications within the footprint of modified features.

	TO							TOTAL:
FROM	Modified Feature[b]	Lake/ Backwater	River	Floodplain Forest	Emergent Wetland	Grasslands/ shrub	Ag/ Croplands	
Existing Feature[a]	5.7		0.4	5.1				**11.2**
Lake/backwater	1.3							**1.3**
River	0.4		0.5[c]					**0.9**
Floodplain Forest	2.3		1.3	0.4				**4.1**
Emergent wetland			2.6	0.4				**3.0**
Grasslands/shrub	4.3							**4.3**
Ag/Croplands	20.0						7.3	**27.3**
TOTAL:	**34.0**	**0.0**	**4.8**	**5.9**	**0.0**	**0.0**	**7.3**	**52.0**
Change:	22.8	-1.3	3.9	1.8	-3.0	-4.3	-20.0	

[a] includes features that are existing or are proposed as part of the 2011 Feasibility Report (e.g., Marsh Lake Dam).
[b] includes proposed modified features (e.g., enlarged fishway, parking lot).
[c] difference in 4% and 3% fishway slope was considered.

5.3.3 Wetland Resources

When considering the larger area of influence, project modifications would have mixed effects to wetland resources. However, the beneficial effects would outweigh adverse effects over the long term as described below.

In the PdT River floodplain, less than 3 acres of emergent wetlands would be directly converted to riverine habitat. Bank stabilization and grade control structures added to the PdT River (M10) would also displace about 2 acres of wetlands temporarily. Despite these losses, the increased connectivity between the PdT River and its floodplain (Appendix G) would result in an increase in the amount, diversity, and quality of wetlands found in the floodplain. Periodic flood events would provide these areas with nutrients and fine sediment in support of emergent vegetation. Over the long-term, wetlands associated with the PdT River would be enhanced with the naturalized structures.

The features associated with the water control structure would directly displace < 0.3 acre of Marsh Lake. In addition, the rerouted dam access road will involve the removal of a culvert at Embankment B, thus resulting in a loss of hydrologic connectivity between a backwater and Marsh Lake. However, the area may periodically have connection to the PdT River during high flows. It is likely that the 13-acre area will remain a backwater, a wetland, or shallow marsh, depending on the elevation of the water table, input from springs in the backwater, and the periodicity of flood pulses into this area from the PdT River (Appendix G).

The abandoned fish pond just downstream of the embankment and to the west of the river would remain isolated from Lac qui Parle, and would continue to function as an isolated wetland. A small part of this (< 0.1 acre) would be converted into the west parking lot.

The Clean Water Act Section 404 analysis (Appendix E) provides additional details on effects to wetlands and aquatic resources of all project features and is not limited to the modifications described in the SEA.

5.3.4 Aquatic habitat

Impacts to aquatic habitat would be mixed. Beneficial impacts with the modifications would include improvements to about 0.5 acre of riverine habitat in the PdT River associated with the riffle structures and naturalized bank stabilization. In addition, the length of the river would be increased by about 5,000 feet with flows directed into the PdT River's historic channel. The river would also have increased lateral connectivity with its floodplain, thus increasing habitat diversity (Appendix G). It is estimated that about 60 additional acres of floodplain forest in the PdT River watershed would benefit. Fish passage between Lac qui Parle and the upper PdT River would be enhanced. The enlarged rockramp would add riffle habitat, which would enhance aquatic habitat diversity. Improvements to the PdT River floodplain would increase the system's resiliency with future flashier hydraulic conditions that are anticipated under climate change forecasts.

Project modifications may result in losses to aquatic habitat. By re-routing the dam access road, hydrologic connectivity (24-inch diameter culverts) between Marsh Lake and a 13-acre backwater and a 37-acre remnant floodplain would be lost (i.e., there are no provisions for culverts to maintain connectivity necessary for maintaining the new dam facing)(Appendix A - Figure 29). It is not clear if this would result in converting the backwater to an emergent wetland, remnant floodplain, or other terrestrial cover type. This would likely be dependent on the effects to the water table elevation. It is likely that a backwater or emergent wetland would remain. However, if the water table fluctuates or drops, the area would likely convert to emergent wetland or terrestrial cover type. Losses of backwater habitat would be partially offset along that portion of the PdT River downstream of Embankment A to Marsh Lake, estimated to be about 16 acres[2] (Appendix A - Figure 30). This is the lowermost portion of the PdT River that would be hydrologically cut off due to Embankment A. This area would then function as a backwater unless sedimentation from natural causes it to fill in over time.

Additional fill would be necessary to construct the larger fishway. It is estimated the larger footprint would cover over 20,000 additional square feet or 0.5 acre (Appendix A - Figure 9). Although there may

[2] This effect was not discussed in the 2011 Feasibility Report.

be additional fill, it would not displace aquatic habitat (i.e., the area would remain aquatic habitat in the form of riffles).

There would be a permanent loss of aquatic habitat to Marsh Lake associated with Embankment B in order to re-route the dam access road (Appendix A - Figure 18). Permanent fill would extend about 75 feet from the center of the road resulting in a net loss of about 1 acre. Temporary disturbance during construction would extend about 150 feet from the center of the road. The small maintenance ramp associated with the water control structure would also displace aquatic habitat.

5.3.5 Habitat diversity and interspersion

In most cases, habitat diversity and interspersion would be improved with the proposed modifications. The larger fishway (M3) would add valuable riffle habitat to a river where this type of habitat is scarce. Removing the dam access road from the PdT floodplain would allow the river more room to migrate naturally and would increase lateral connectivity between the river and its floodplain. In addition, prairie grass would become established in the upland area where the road core was removed.

Relocating the water control structure to the west of the fishway would result in a displacement of about 2.2 acres of terrestrial vegetation by the associated outflow channel (Appendix A - Figure 4). Excavation of this area is needed to direct flows through the water control structure and back into the tailwaters.

5.3.6 Biological productivity

The reduced slope of the fishway would improve fish passage performance as demonstrated by monitoring by MNDNR of similar projects. Additional life stages and more species of fish would have connectivity between Marsh Lake and Lac qui Parle, thus increasing biological productivity of fish and mussel populations. The use of natural bank stabilization techniques instead of rip-rap on the PdT River would increase vertebrate diversity and productivity.

5.3.7 Surface water quality

The proposed modifications would result in improved surface water quality over the long-term. Eliminating the dam access road along much of the PdT River floodplain would reduce sediment, nutrients, and other runoff materials because removal of the road would enhance lateral connectivity of the PdT River to its floodplain. When flows overtop the banks of the river, sediment and nutrients would become captured in much of the floodplain's terrestrial vegetation.

Other modifications that encroach on water such as the larger fishway would require additional construction that would increase impacts to water quality in the form of higher concentrations of suspended sediment. However, the impacts would remain temporary and localized with the implementation of Best Management Practices (BMPs) and adherence to other conditions of Minnesota Pollution Control Agency's (MPCA) Clean Water Act Section 401 water quality certification. These will be further specified during the next phase of planning: development of plans and specifications. Potential

BMPs may include construction during low flow periods, use of silt curtains, vegetation plans to minimize vegetation clearing, minimizing the time period of exposed soils, control of stormwater flow from any upland areas disturbed during construction, and other methods. Given the Corps' prior experience with similar restoration projects, and its success in controlling short-term turbidity impacts from construction of those projects, it is reasonable to assume that no substantial impacts would occur to water quality. BMPs have traditionally been successfully used to minimize short-term impacts associated with projects that focus on grading and rock within and along streams and rivers.

5.3.8 Protected species

Federally-listed species. No impacts to Federally-listed species are anticipated with the proposed modifications. For northern long-eared bat, tree removal activities would be restricted to periods outside of brooding/roosting to avoid impacts.

State-listed species. Some project features would result in temporary adverse impacts on state-listed mussel species, particularly in the lowermost reach of the PdT River that will be cut off from flows. If resources are available to relocate these mussels, then this impact would be diminished. Additionally, mussel populations in the PdT River are expected to re-colonize the restored river channel and result in a net gain in the abundance and spatial extent of native mussels in the river over time. Mussel populations in the Minnesota River that are covered by the fishway material are also anticipated to recolonize over time.

Bald Eagles. Bald eagles that may be nesting in proximity to disturbance caused by construction activities may be adversely affected. Bald eagles that are sensitive to human disturbance may be displaced or may not produce any offspring. It is possible that affected nests would be abandoned and no longer be productive. Over the long-term, however, the healthier floodplain forest associated with the PdT River will enhance nesting habitat for bald eagles.

5.4 Environmental Justice

Section 6.7.16 of the 2011 Feasibility Report/EA discusses the original Project in relation to Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations". This determined that the original project will not have a disproportionately high adverse effect on minority or low income populations and is in compliance with EO 12898.

The same determination is made for the proposed modifications as these would not have a disproportionately high adverse effect on minority or low income populations and is in compliance with EO 12898. The project is located in a rural area with few residents nearby. Native American communities in the region do not use Marsh Lake or Lac qui Parle for subsistence hunting, gathering or fishing. Project modifications would generally have beneficial social and economic effects and would generally affect all persons equally.

5.5 Greenhouse Gas Emissions

Based on the amount of material that is excavated or used as fill, construction associated with the proposed modifications is anticipated to result in emissions less than 25,000 metric tons of CO^2 per year. Over the long-term, the project modifications will result in a healthier floodplain forest associated with the PdT River that will act as a carbon sink[3]. However this effect has not been quantified.

5.6 Cumulative Effects

The combined incremental effects of human activity are referred to as cumulative impacts (40 CFR 1508.7). While these incremental effects may be insignificant on their own, accumulated over time and from various sources, they can result in serious degradation to the environment. The cumulative impact analysis must consider past, present, and reasonably foreseeable actions in the study area. As required by NEPA, the Corps has prepared the following assessment of cumulative impacts related to the project modifications being considered in this SEA.

In addition to the other actions identified in Section 6.7.17 of the 2011 Feasibility Report/EA, MNDNR is considering extending the bicycle trail as described above. The proposed modification of the walkway over the water control structure has accounted for the potential for a new bicycle trail. In most cases, modifications would result in positive effects to resources. When added to the original Project, the proposed modifications generally have a negligible short-term impact on the resource categories evaluated in this SEA.

6.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Section 8 of the 2011 Feasibility Report/EA describes and assesses compliance of environmental laws and regulations for the original project. Full compliance is defined as having met all requirements of the statute for the current stage of planning. In some cases, further authorization and certification will be required prior to and during construction. Partial compliance indicates that information is still being collected or disseminated to and from proper agencies. At that time, several laws and regulations were found to be in partial compliance. An updated summary of the 2011 report with consideration to project modifications is provided in Table 4. A discussion is provided below where partial compliance is indicated.

6.1 Bald and Golden Eagle Protection Act

This Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions for scientific or exhibition purposes, for religious purposes of Indian Tribes, or for the

[3] The aquatic vegetation anticipated with lake-level drawdowns in Marsh Lake will also serve as carbon sinks over the long-term.

protection of wildlife, agriculture or preservation of the species. There are known nests located in the project area which may become inactive, or new ones may be found prior to construction. In coordination with the MNDNR and USFWS, the Corps will update the location of active/inactive eagle nests relative to project features immediately prior to construction[4]. The Corps will determine if construction activities will result in disturbance to bald eagles following the guidelines[5] provided by the USFWS. Should disturbance be unavoidable, the Corps will seek to obtain a USFWS Non-Purposeful Take permit, which will allow construction activities to proceed.

6.2 Clean Water Act

Section 404 of the Clean Water Act is administered by the Corps of Engineers. An updated Section 404 analysis is included as part of this report (Appendix E).

Section 401 of the Clean Water Act requires any applicant for a federal license or permit to conduct an activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State (in this case, the MPCA). The Corps has coordinated this project with the MPCA and is in the process of obtaining Section 401 water quality certification (Appendix D). During coordination on the draft SEA, the MPCA indicated that they did not anticipate any major issues with the proposed modifications (Wilde 2015). A National Pollutant Discharge Elimination System (NPDES) permit may also be needed and would be obtained by the selected contractor.

6.3 Fish and Wildlife Coordination Act

The USFWS provided correspondence pursuant to the Fish and Wildlife Coordination Act (FWCA) as part of the draft SEA (Appendix D). They did not identify any substantive issues.

6.4 Floodplain Management

Executive Order 11988 as amended by EO 12148 requires minimizing federal activities that negatively affect floodplains in order to protect lives and structures. The proposed modifications meet the intent of the Executive Order by enhancing the PdT River's connectivity and restoring natural floodplain functions. The project is not anticipated to result in increased flood risk to lives or structures.

6.5 National Historic Preservation Act

The Corps followed all applicable measures in accordance with the National Historic Preservation Act (54 U.S.C. 100101, olim 16 U.S.C. 470) and it's implementing guidelines (36 C.F.R. 800). A Memorandum of Agreement was formulated, resulting in Level II Minnesota Historic Property Record documentation for the dam structure and Phase I and Phase II cultural resources investigations were completed for the proposed and alternate borrow areas (Appendix D). An existing precontact site at the proposed borrow area was determined to be not eligible for listing on the National Register of Historic Places. Two cultural resource sites were identified at the alternate borrow area and will be avoided. Tribal

[4] Eagle nesting activity is usually determined by early spring.
[5] http://www.fws.gov/midwest/midwestbird/eaglepermits/baeatake/index.html

consultation was completed and review of the final cultural resources report with the Minnesota State Historic Preservation Office has been completed. The project will not affect these resources.

6.6 Protection and Enhancement of the Cultural Environment

Executive Order 11593 directs federal agencies to inventory their cultural resources and establish policies and procedures to ensure the protection, restoration, and maintenance of federally owned sites, structures, and objects of historical, architectural, or archaeological significance. The Corps has completed its inventory within the project area in accordance with the Memorandum of Agreement and has concluded that there is little to no risk to these resources.

6.7 Climate Change

Climate change has become an area of concern due to the potential for effects on numerous aspects of the environment, especially those related to water resources. In December, 2014, the Council on Environmental Quality (CEQ) issued draft guidance to provide Federal agencies direction on considering the effects of greenhouse gas (GHG) emissions and climate change in evaluating Federal actions in accordance with NEPA (http://go.usa.gov/3KEyR). Over the next few decades, the Midwest region is anticipated to experience longer growing seasons and rising carbon dioxide levels with extreme weather events (http://www.globalchange.gov/explore/midwest). The composition of forests are anticipated to change, threatening their role in carbon sequestration.

The proposed project modifications are intended for ecosystem restoration, which will increase the systems' resiliency to future flashier hydraulic conditions anticipated from climate change. Furthermore, the increased connectivity of the PdT River with its floodplain will increase the health of the system. Therefore, consideration of future climate change and its effects would not contradict the need for the proposed project.

7.0 COORDINATION

7.1 Agency Coordination

The proposed modifications have been coordinated with the U.S. Environmental Protection Agency (EPA), U.S. USFWS, MNDNR, Minnesota Pollution Control Agency (MPCA), SHPO, and the Upper Minnesota River Watershed District (UMRWD). A total of 17 comments were received and were used to revise this final SEA (Appendix D).

The letter from the USFWS was provided in accordance with NEPA, the Endangered Species Act, the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act, and the Fish and Wildlife Coordination Act (FWCA) (Appendix D). Their records confirmed that no federally listed or proposed species and/or designated or proposed critical habitat have been found within the project area. This letter constitutes USFWS' FWCA report.

The MPCA reviewed the propose modifications to the project and indicated they do not anticipate any major issues blocking the issuance of the Clean Water Act Section 401 certification (Appendix D). This will be issued after the State of Minnesota completes the Environmental Assessment Worksheet (EAW) process and a Record of Decision (ROD) is signed.

There has been additional coordination with agencies on the proposed project's monitoring and adaptive management plan which was described at a conceptual level in Appendix R of the 2011 Feasibility Report/EA. This plan is under further development, and is summarized to date in Appendix F of this SEA.

7.2 Public Coordination

The SEA and Section 404 Evaluation was also made available to the public and on the St. Paul District website for review and comment (Appendix D). Several comments were received by individuals and two Non-Government Organizations, which have been considered as part of the final SEA. After the expiration of the review period, changes and additional detail were proposed for the construction methods for the project. This led to a proposal for the inclusion of up to seven additional temporary coffer dams. Therefore, the District has revised the Section 404(b)(1) evaluation to include these coffer dams which was distributed for public comment ending 28 March 2016. Two comments were received with no substantive issues (Appendix D).

Table 4. Laws, Regulations, and Executive Orders Applicable to Planning the Marsh Lake Project and Current Compliance Status.

Federal Policy	Compliance Status
Bald and Golden Eagle Protection Act, 42 USC 4151-4157	Partial
Clean Air Act, 42 USC 7401-7542	Full
Clean Water Act, 33 USC 1251-1375	Partial
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Endangered Species Act, 16 USC 1531-1543	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Full
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	Full
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Full
Fish and Wildlife Coordination Act, 16 USC 661-666c	Full
Floodplain Management (EO 11988 as amended by EO 12148)	Full
Food Security Act of 1985, 7 USC varies	Full
Invasive Species (EO 13112)	Full
Land and Water Conservation Fund Act, 16 USC 460d-461	Full
Migratory Bird Treaty Act of 1918, 16 USC 703-712	Full
National Environmental Policy Act, 42 USC 4321-4347	Full
National Economic Development (NED) Plan	Full
National Historic Preservation Act, 16 USC 470 et seq.	Full
Noise Control Act, 42 USC 7591-7642	Full
Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities (EO 11282 as amended by EO's 11288 and 11507)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990 as amended by EO 12608)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Protection of Migratory Birds (EO 13186)	Full
Resource Conservation and Recovery Act, 42 USC 6901-6987	Full
Rivers and Harbors Act, 33 USC 401-413	Full
Water Resources Development Acts of 1986, 1990, 2000, 2007, and 2014	Full
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full

8.0 REFERENCES

Aadland, L. 2010. Reconnecting Rivers: Natural Channel Design in Dam Removals and Fish Passage. Minnesota Department of Natural Resources. http://www.dnr.state.mn.us/eco/streamhab/reconnecting_rivers.html.

Fasbender, Peter. 2015. Letter regarding Draft Environmental Assessment for the Marsh Lake Ecosystem Restoration Project: Big Stone, Lac qui Parle, and Swift Counties, Minnesota. June 1. FWS TAILS #2015-CPA-0023.

Minnesota Department of Natural Resources (MNDNR). 2010. Toe-Wood-Sod Mat Factsheet. St. Paul, Minnesota.

U.S. Army Corps of Engineers (USACE). 2004. Minnesota River Basin reconnaissance study. Section 905(b) analysis (WRDA 1986). Minnesota, South Dakota, North Dakota and Iowa. St. Paul District, U.S. Army Corps of Engineers. St. Paul, Minnesota.

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USACE. 2015. Marsh Lake Ecosystem Restoration Project Value Based Design Charrette Report. St. Paul District, U.S. Army Corps of Engineers. St. Paul, Minnesota. Report No. CEMVR-VE-FY15-01.

USACE and MNSHPO. 2010. Memorandum of Agreement between the U.S. Army Corps of Engineers, St. Paul District, and the Minnesota State Historic Preservation Officer Regarding Mitigation of Adverse Effects to Marsh Lake Dam Resulting from the Marsh Lake Ecosystem Restoration Project, Swift, Lac qui Parle, and Big Stone Counties, Minnesota.

USACE and MNDNR. 2016. Standing Instructions to the Project Manager for Water Control. Draft. In prep.

Wilde, William. 2015. Email to David Potter (USACE) regarding Marsh Lake Ecosystem Restoration Project and water quality certification. July 15.

APPENDICES

Appendix A:

Marsh Lake Project - Figures and Drawings

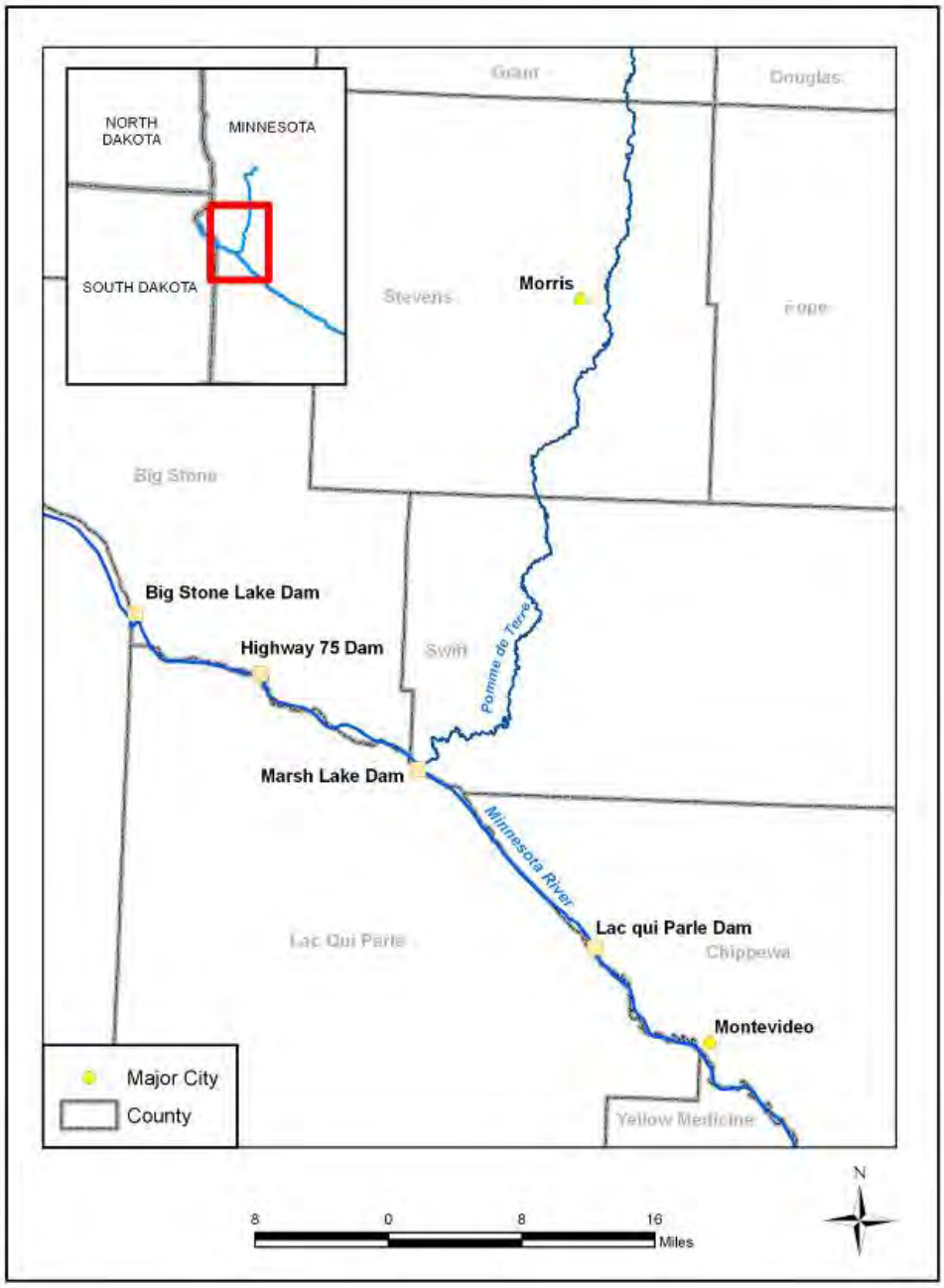


Figure 1. Marsh Lake Dam location on the Minnesota River in western Minnesota.

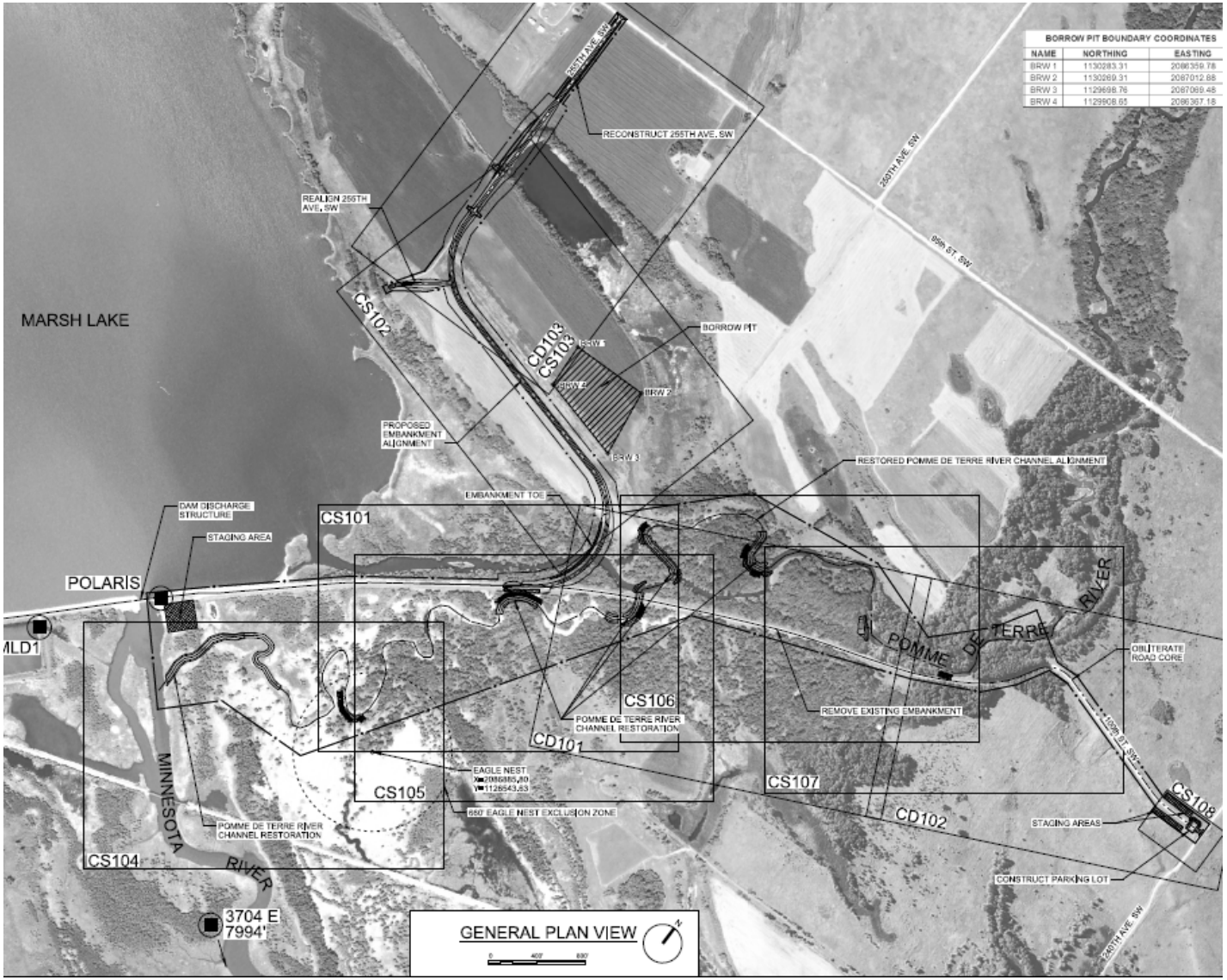


Figure 2. General plan view of the Marsh Lake restoration project.

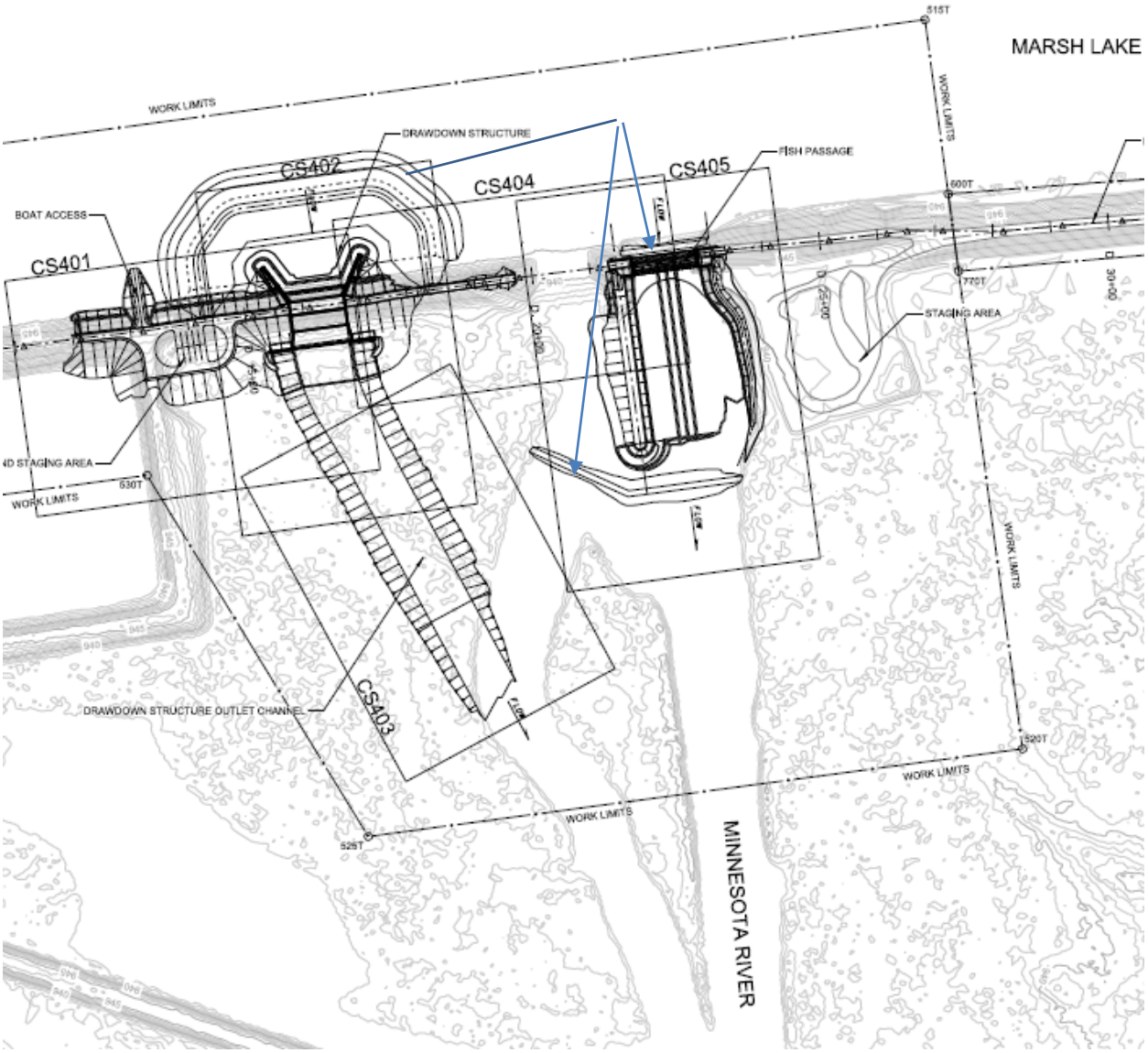


Figure 3. Locations of water control structure, fishway, west parking lot, and temporary coffer dams for Marsh Lake Dam.

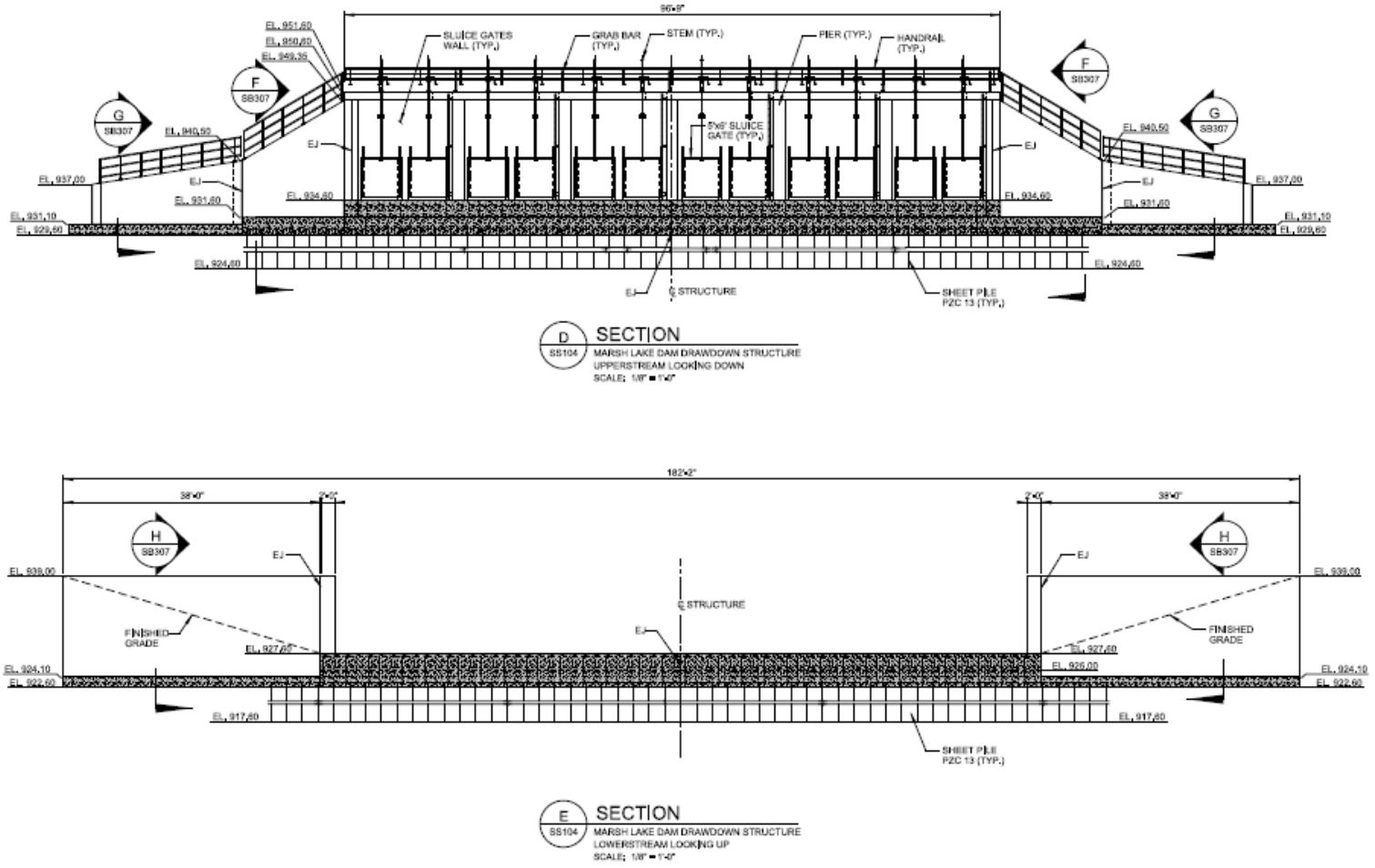


Figure 4. Marsh Lake Dam drawdown structure.

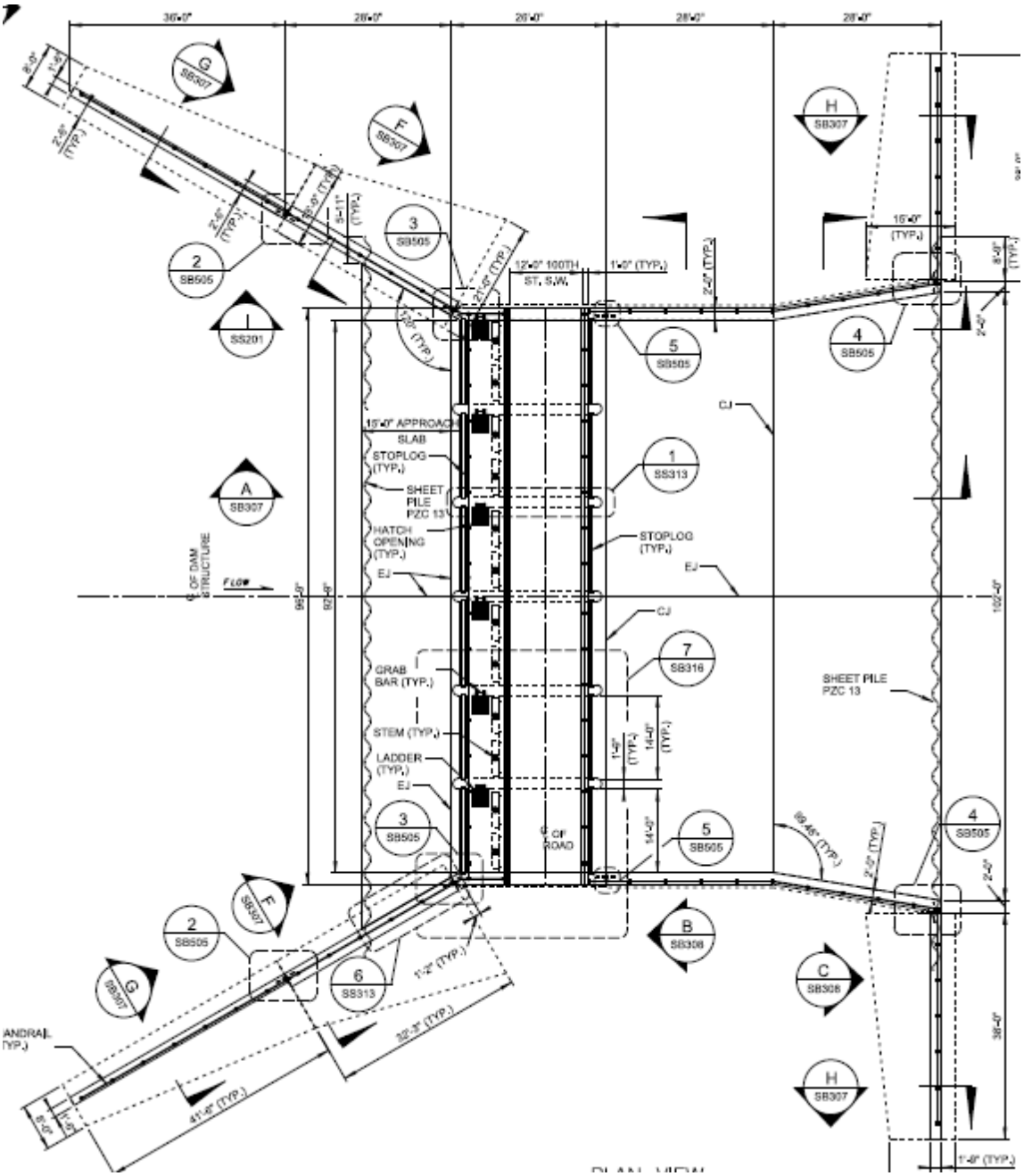


Figure 5. Plan view of the Marsh Lake drawdown structure.

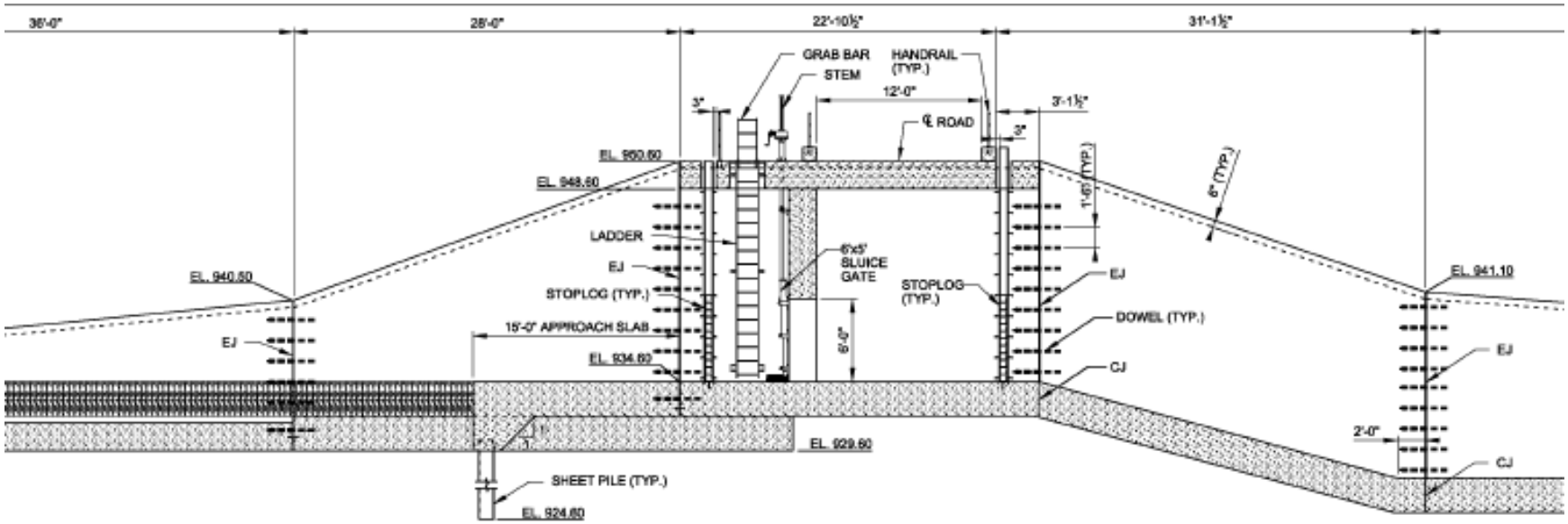


Figure 6. Side view of Marsh Lake Dam drawdown structure.

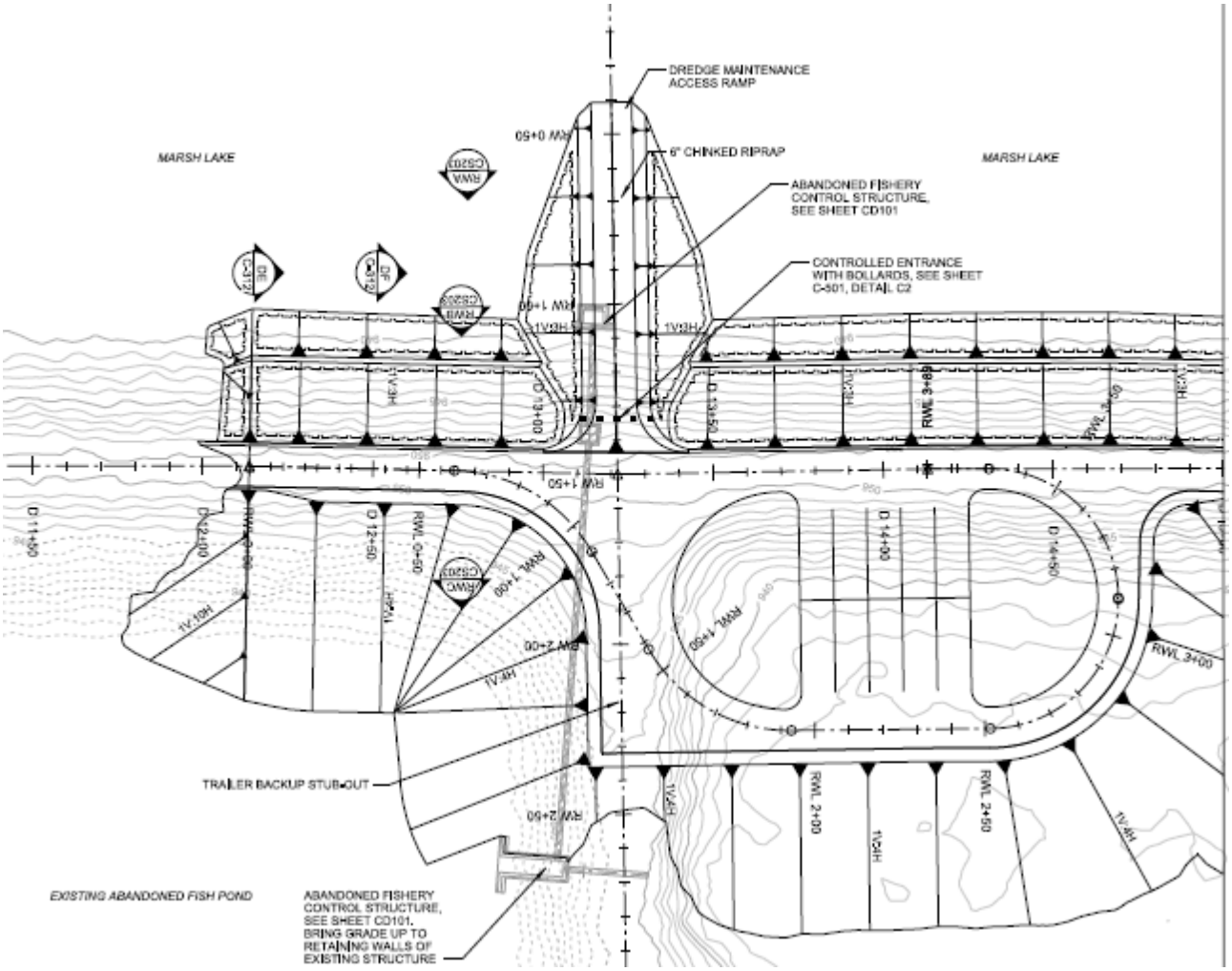


Figure 7. Maintenance access ramp for water control structure and west side parking turnaround

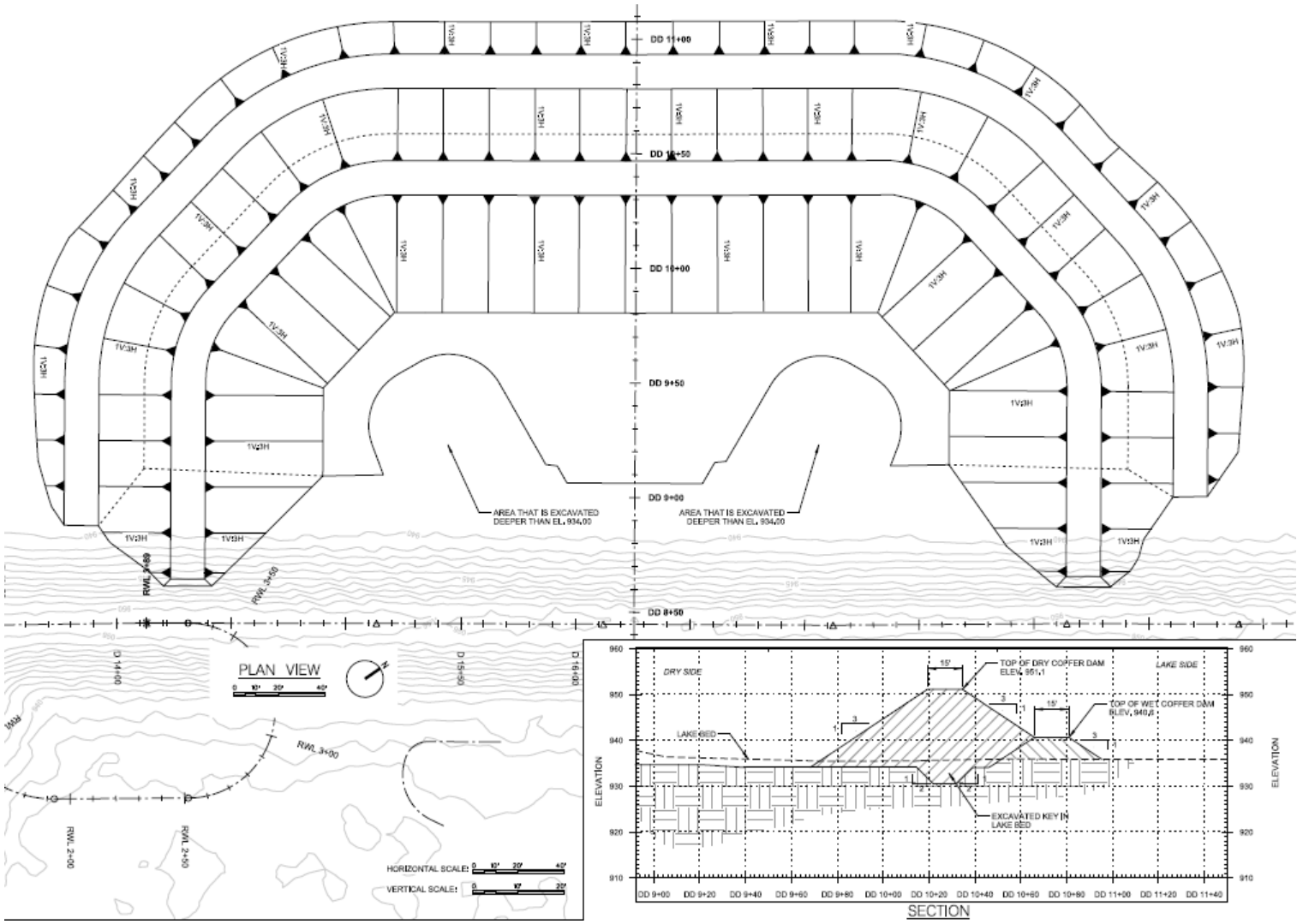


Figure 8. Temporary coffer dams for water control structure.

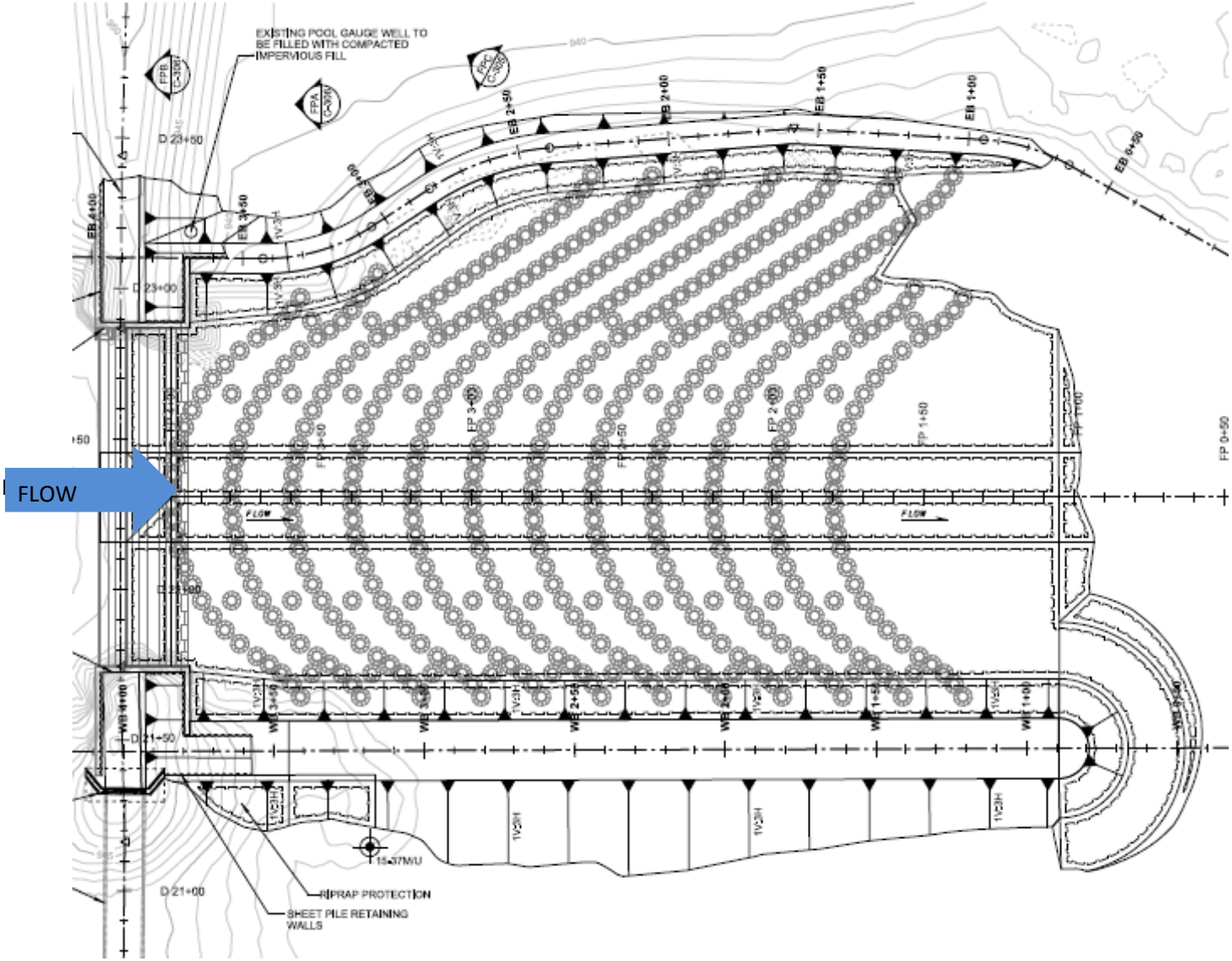
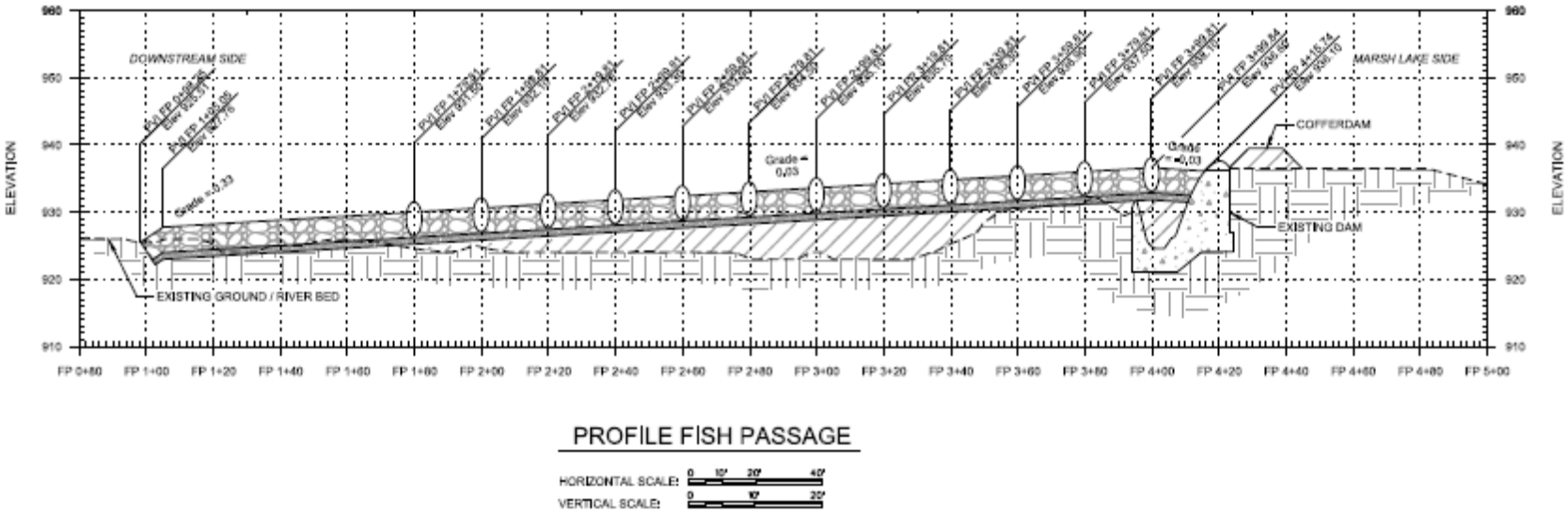


Figure 9. Marsh Lake Dam fishway design with a 3% slope.



PROFILE FISH PASSAGE

HORIZONTAL SCALE: 0 10' 20' 40'

VERTICAL SCALE: 0 10' 20'

Figure 10. Profile of the Marsh Lake Dam fishway.

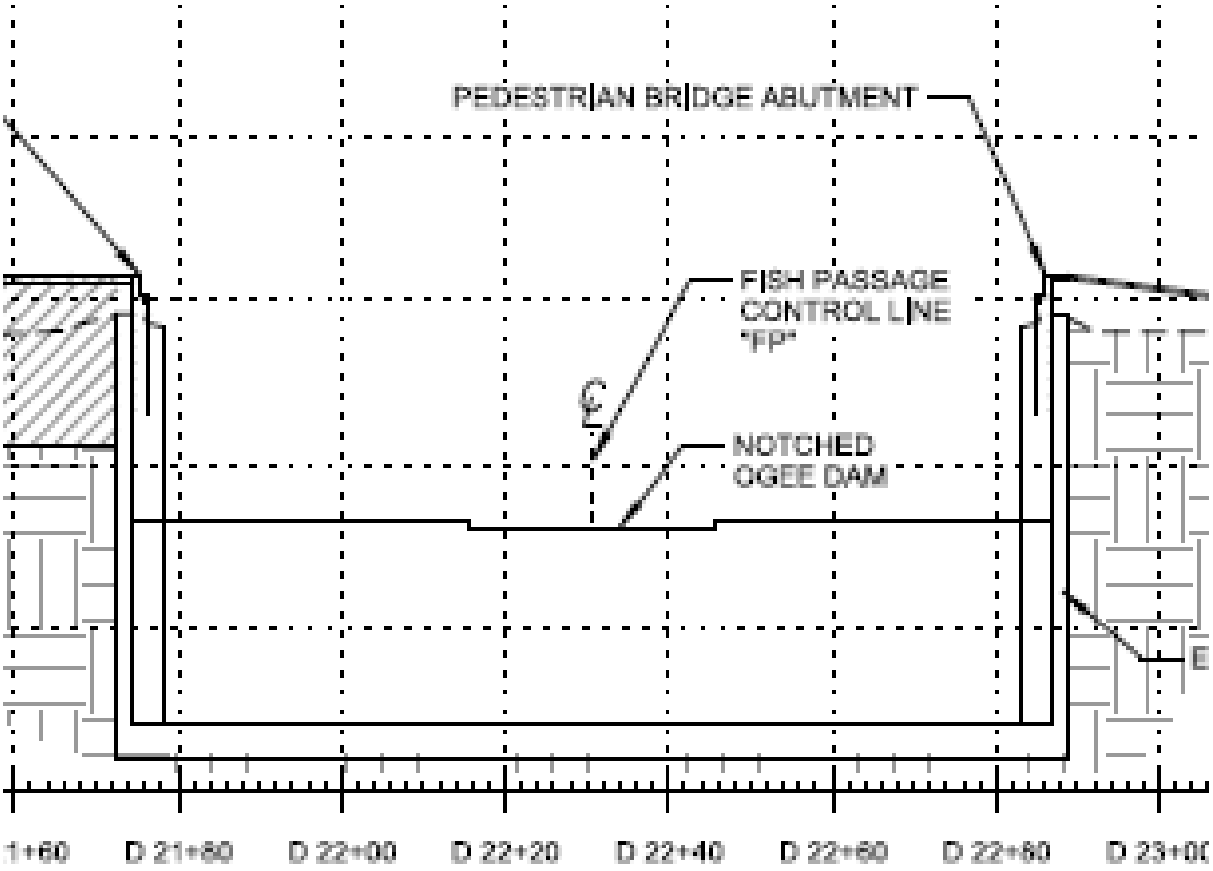


Figure 11. Cross section of Marsh Lake Dam with notch for rockramp fishway.

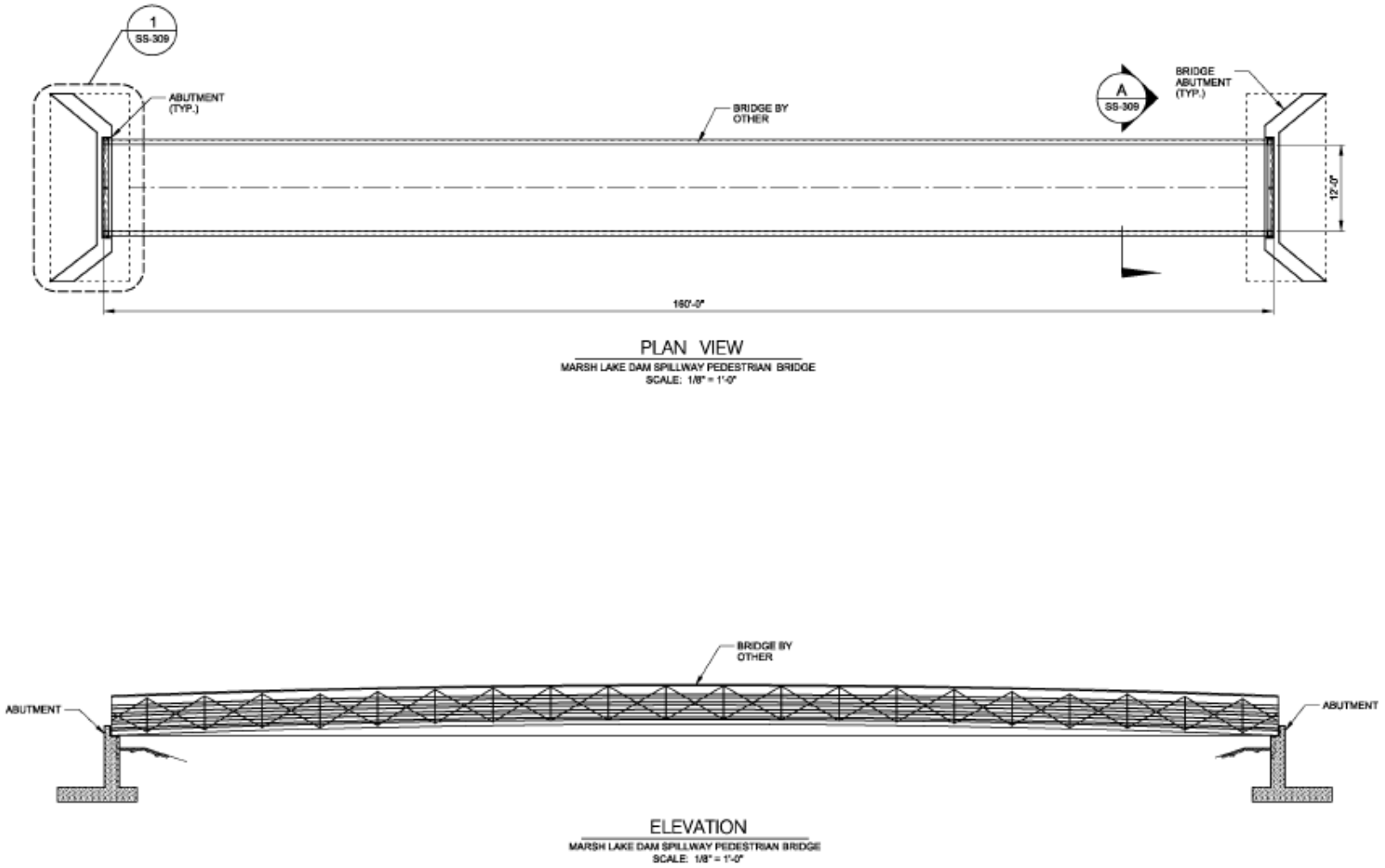


Figure 12. Marsh Lake Dam spillway pedestrian bridge.

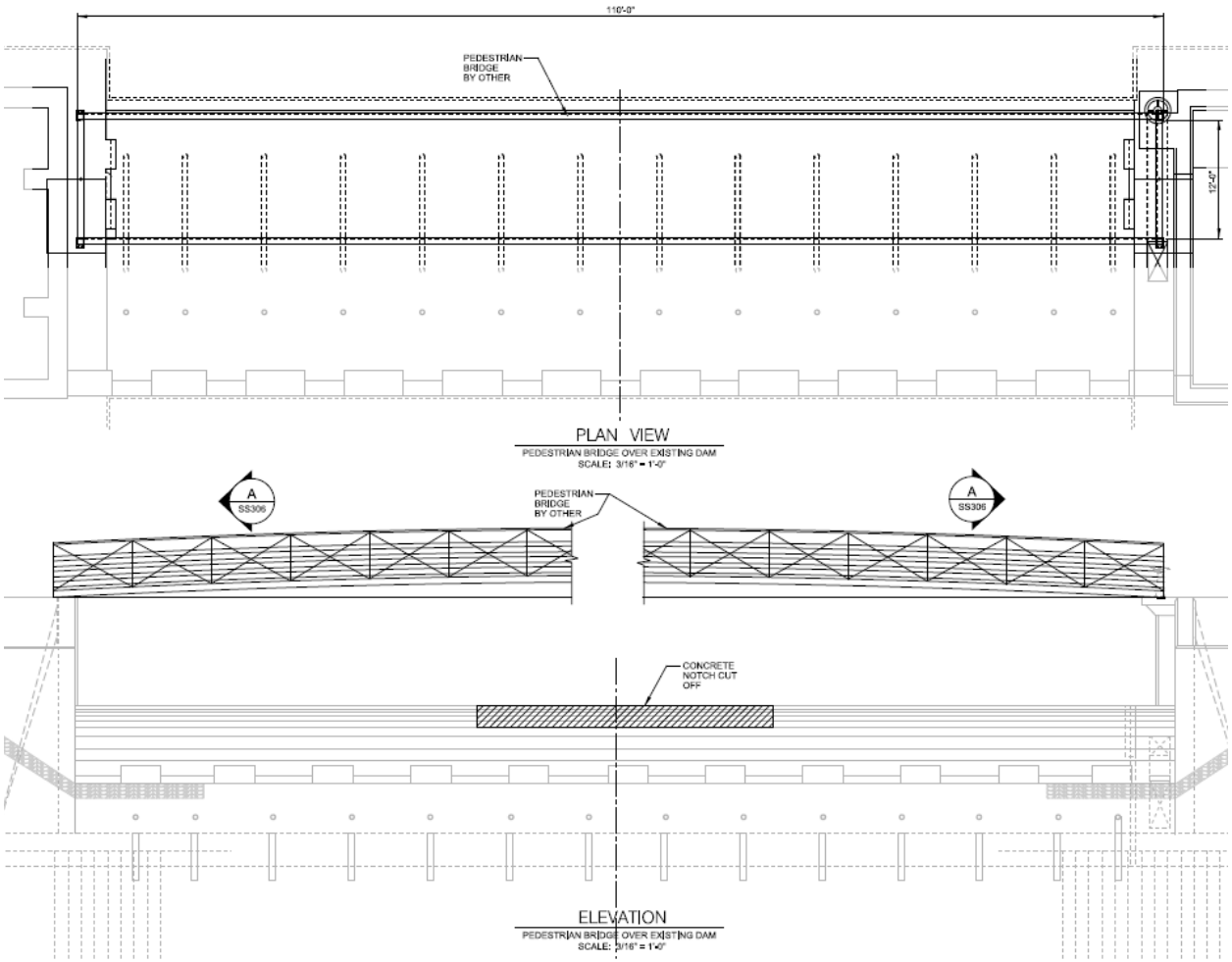


Figure 13. Pedestrian bridge over existing dam and proposed fishway.

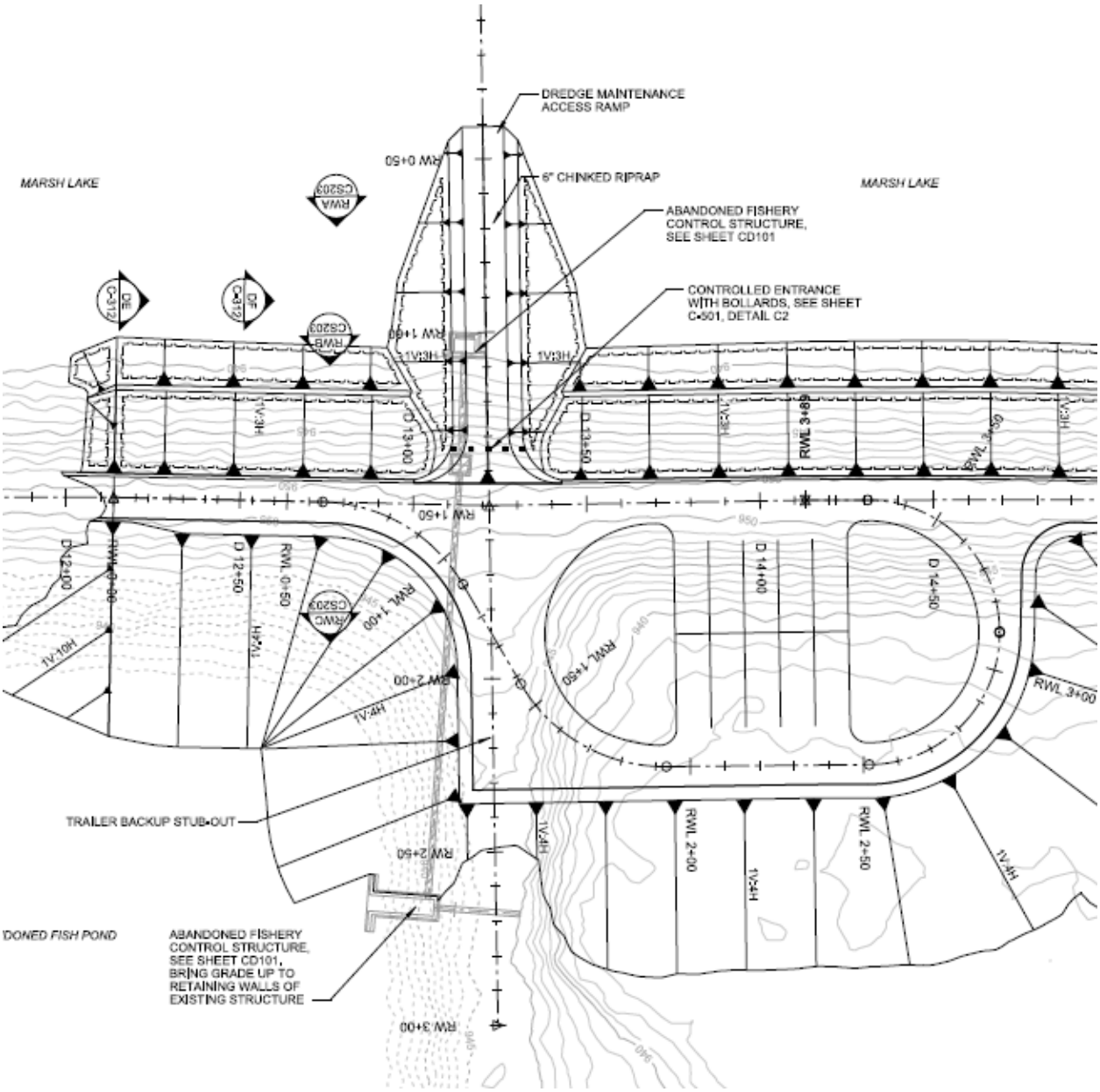


Figure 14. West side parking turnaround and staging.

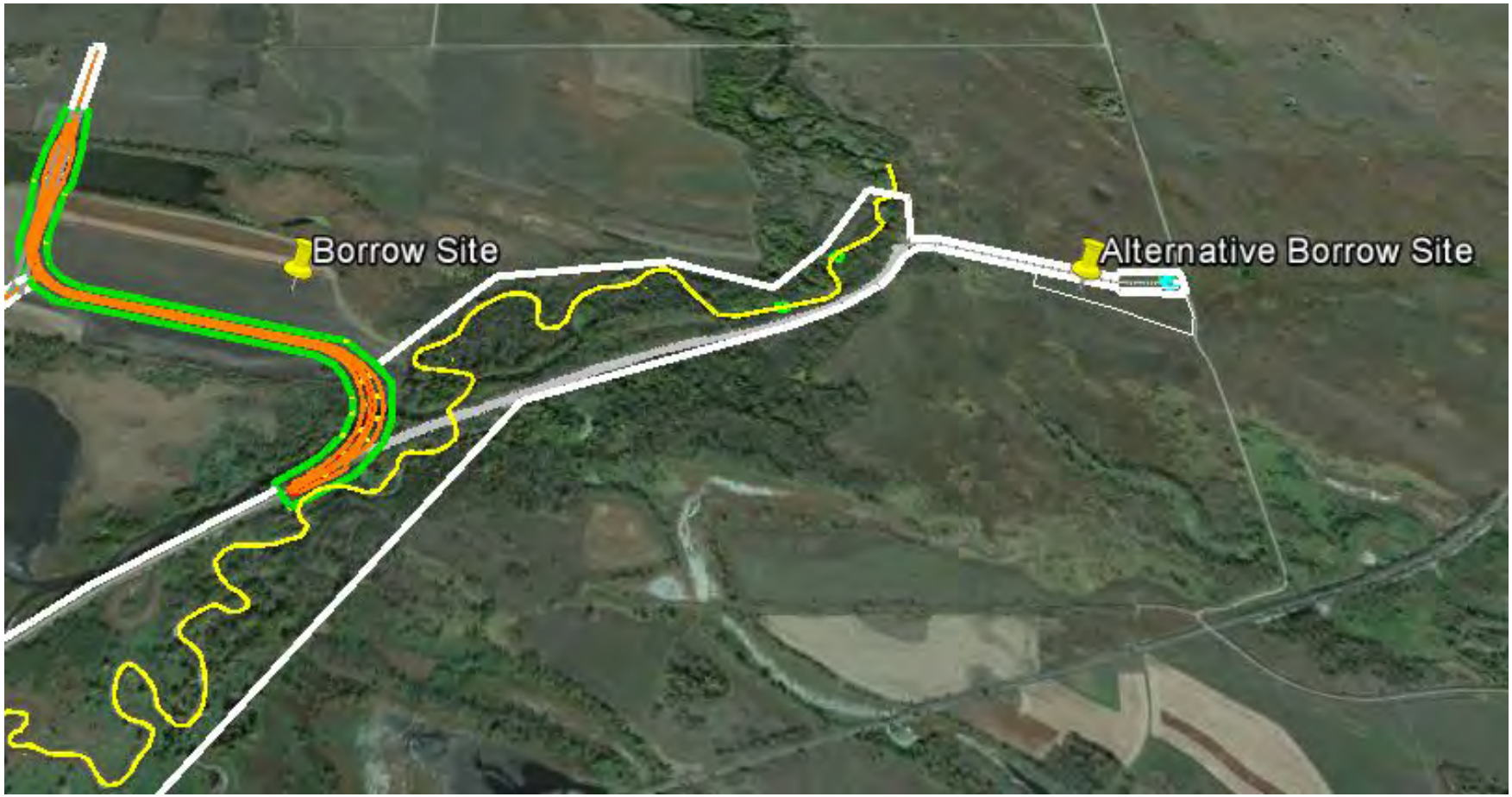


Figure 15. Approximate locations of preferred 10-acre borrow site and alternative 6-acre borrow site as part of Project modifications

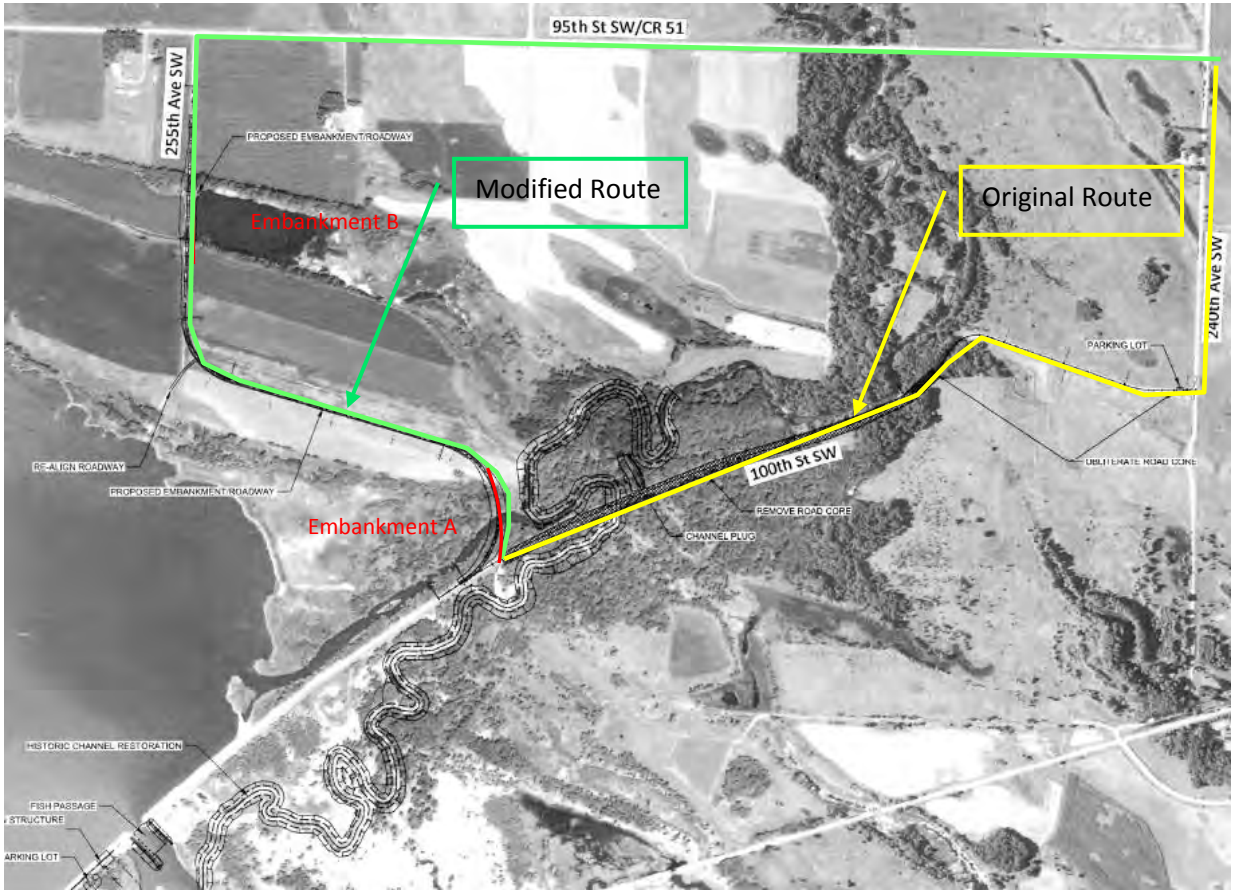


Figure 16. Re-route of dam access road as part of Project modifications

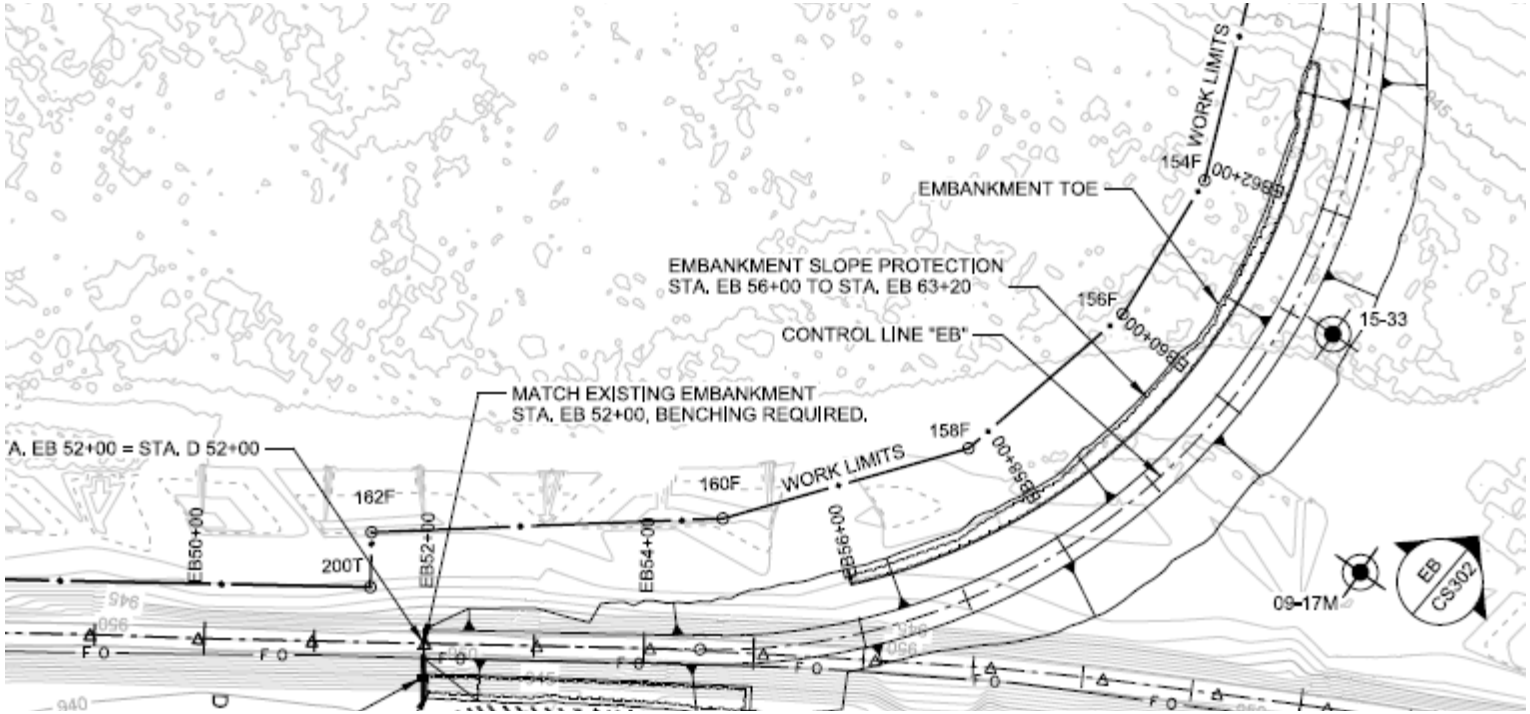


Figure 17. Embankment A - cut off dike crossing the PdT River

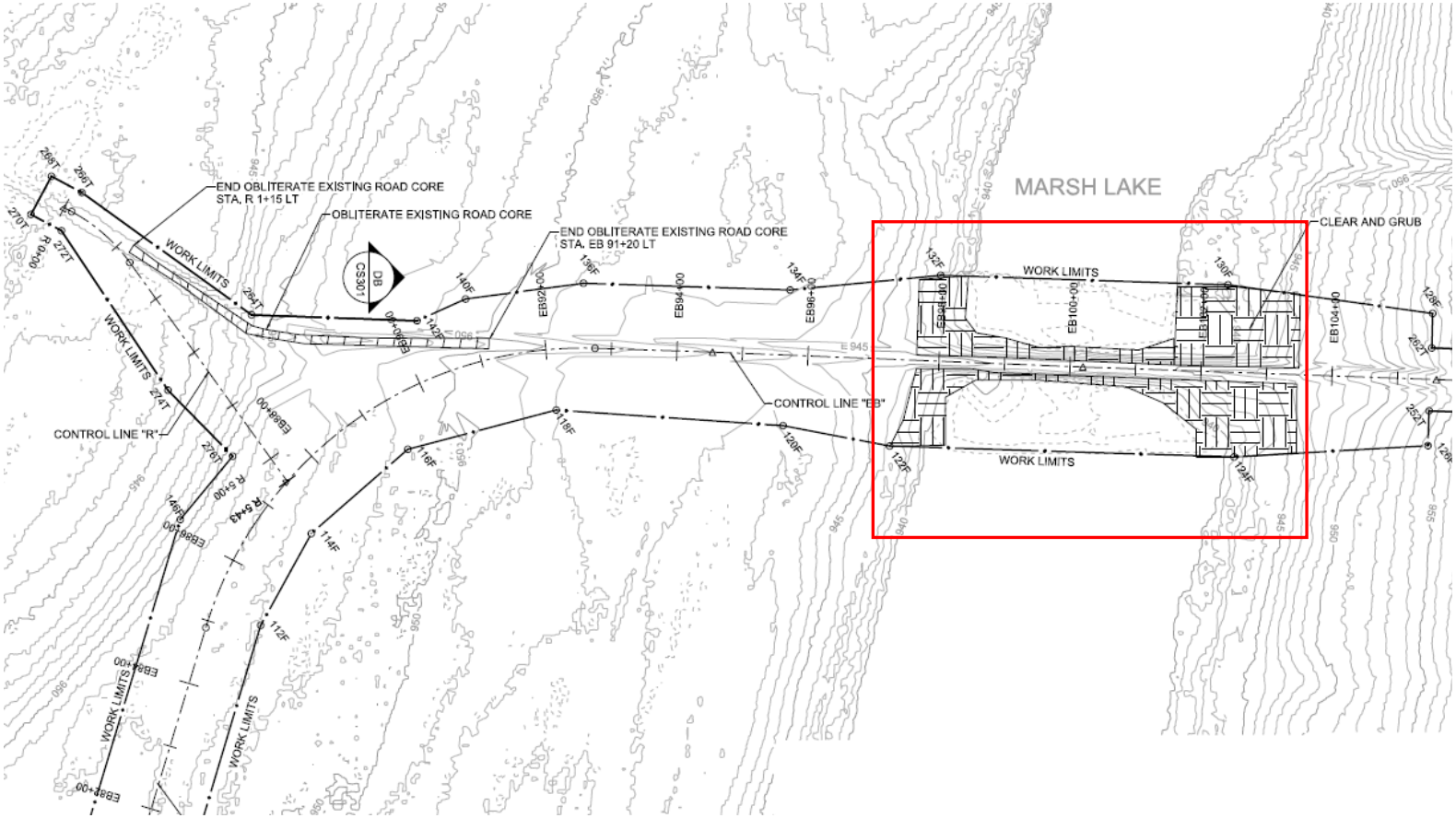


Figure 18. Embankment B and access road

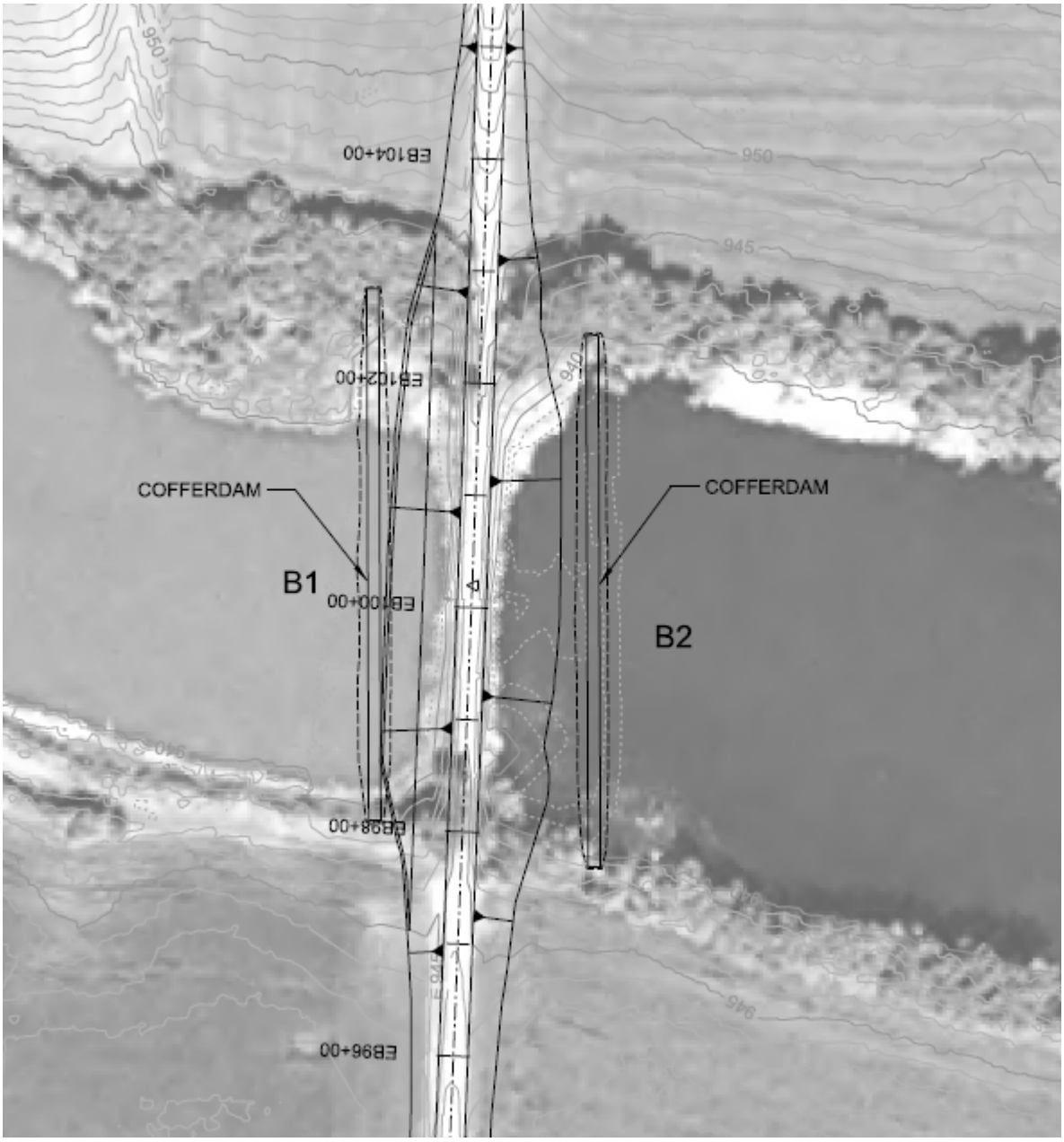


Figure 19. Embankment B and conceptual plan for coffer dams.

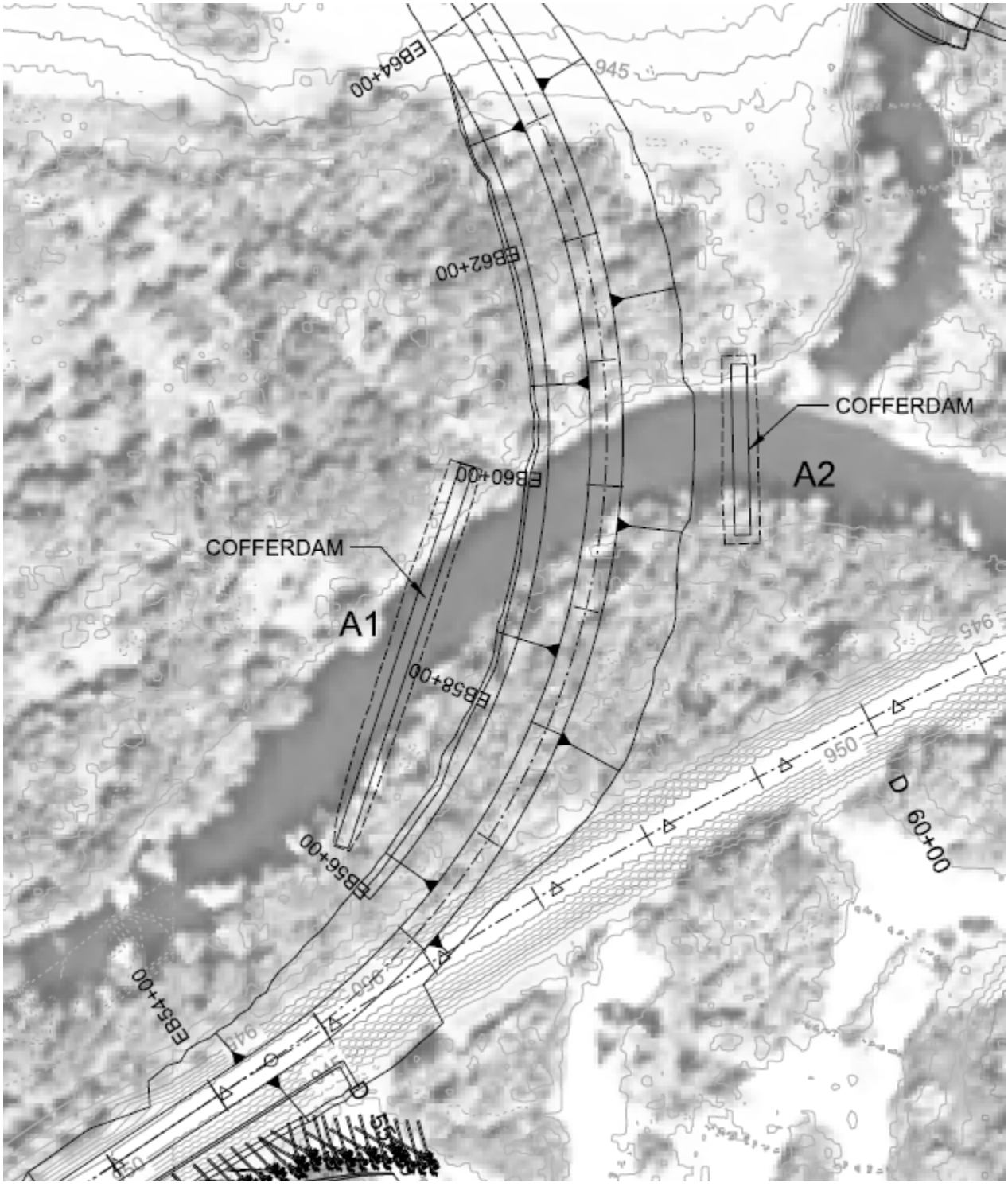


Figure 20. Embankment A and conceptual plan for coffer dams.

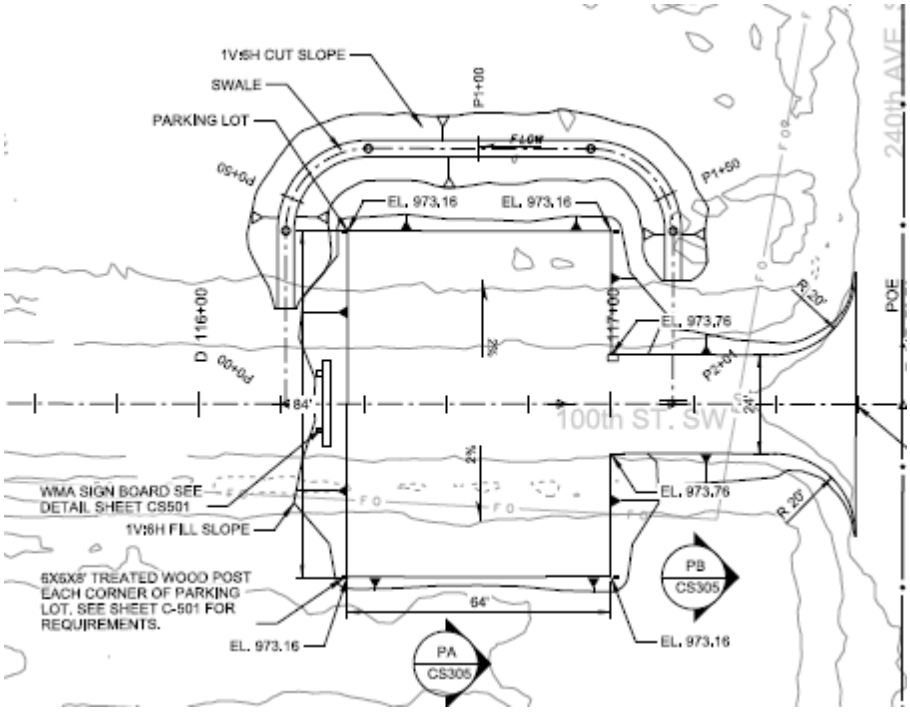


Figure 21. East parking lot

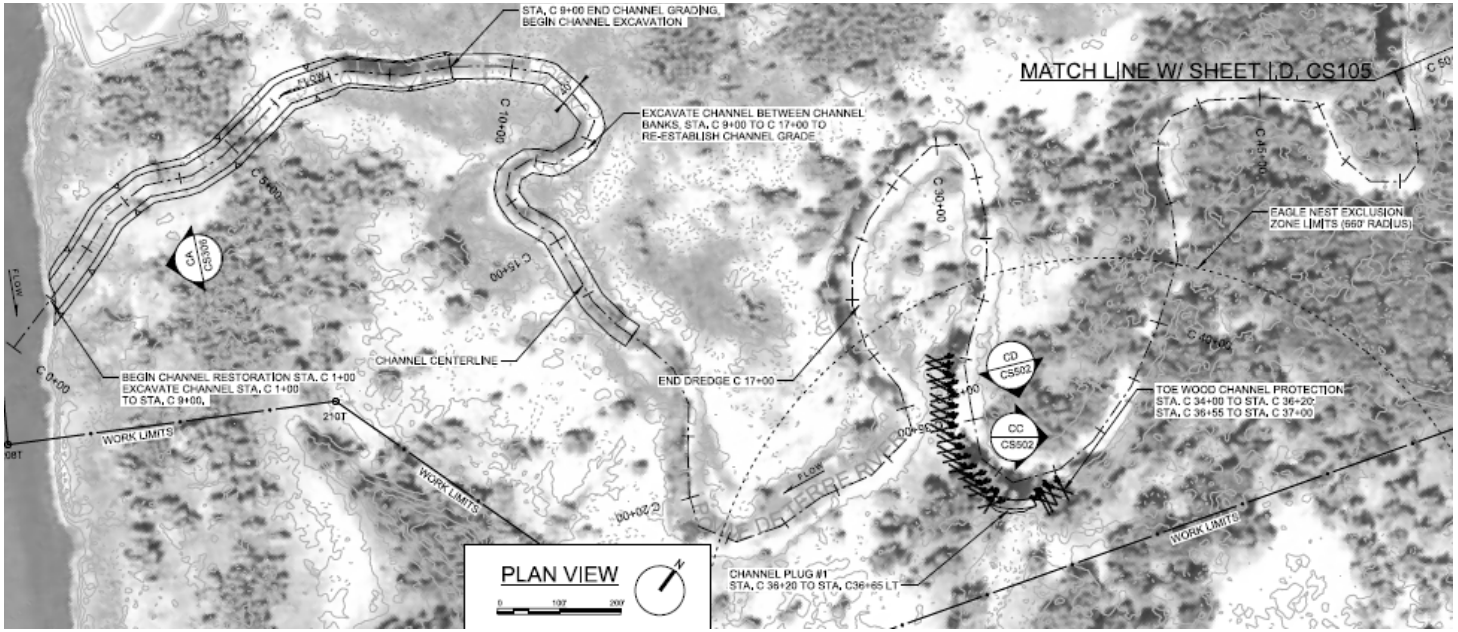


Figure 22. Pomme de Terre River re-route, section downstream of embankment (mouth)

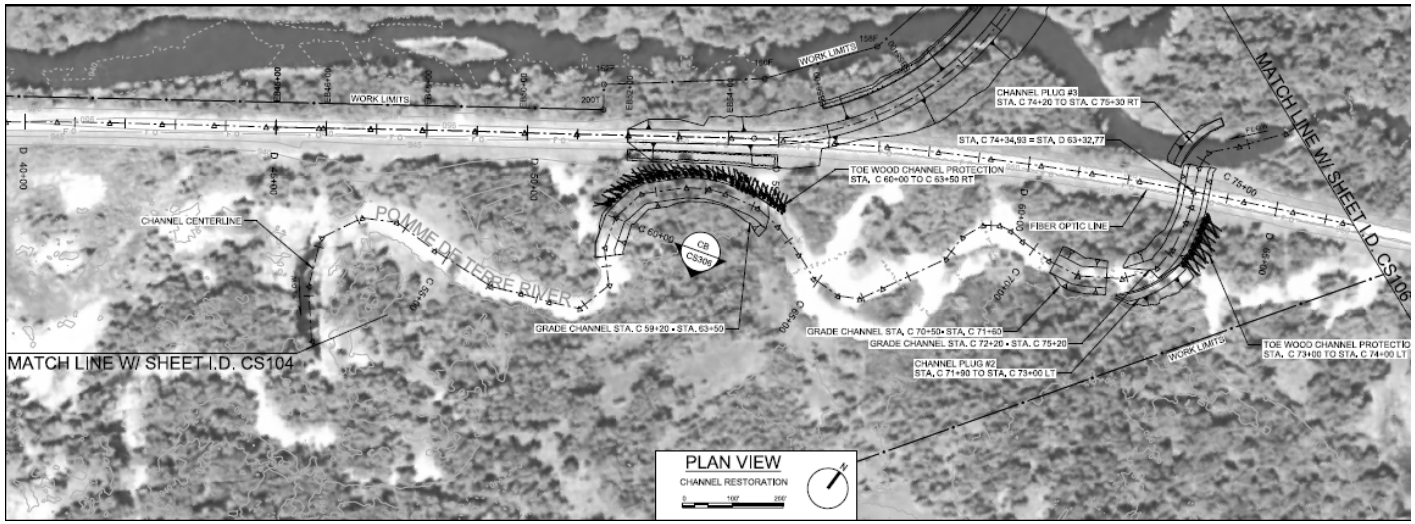


Figure 23. Pomme de Terre River re-route, section through the embankment

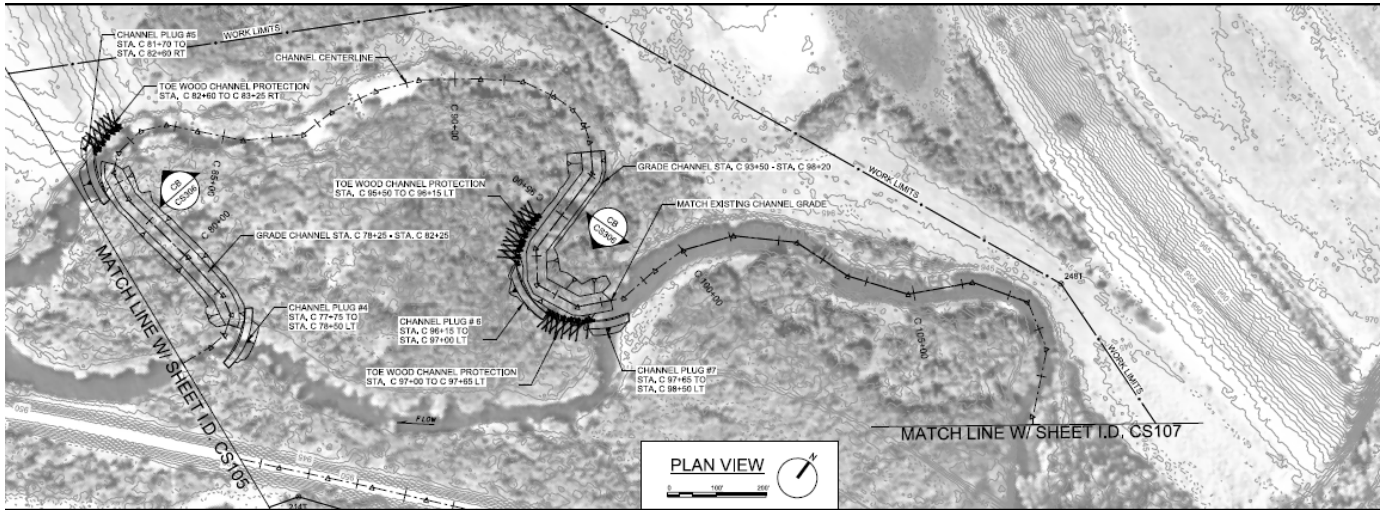


Figure 24. Pomme de Terre River re-route, section upstream of the embankment

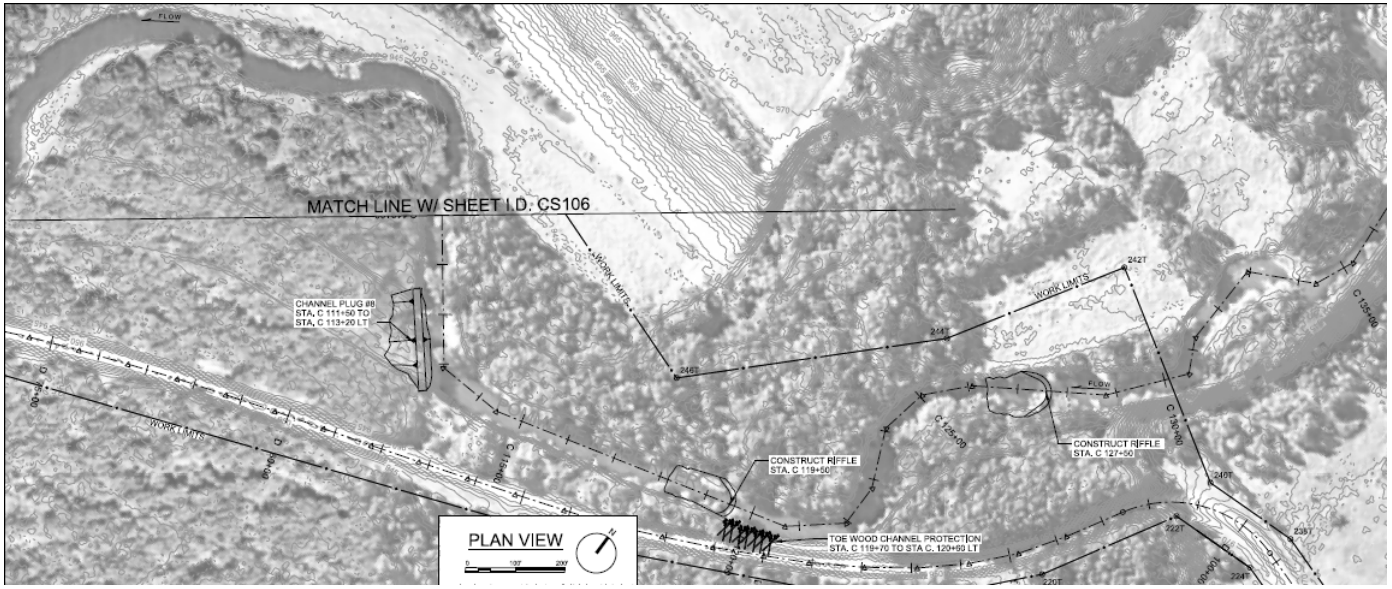


Figure 25. Pomme de Terre River re-route, upstream-most section

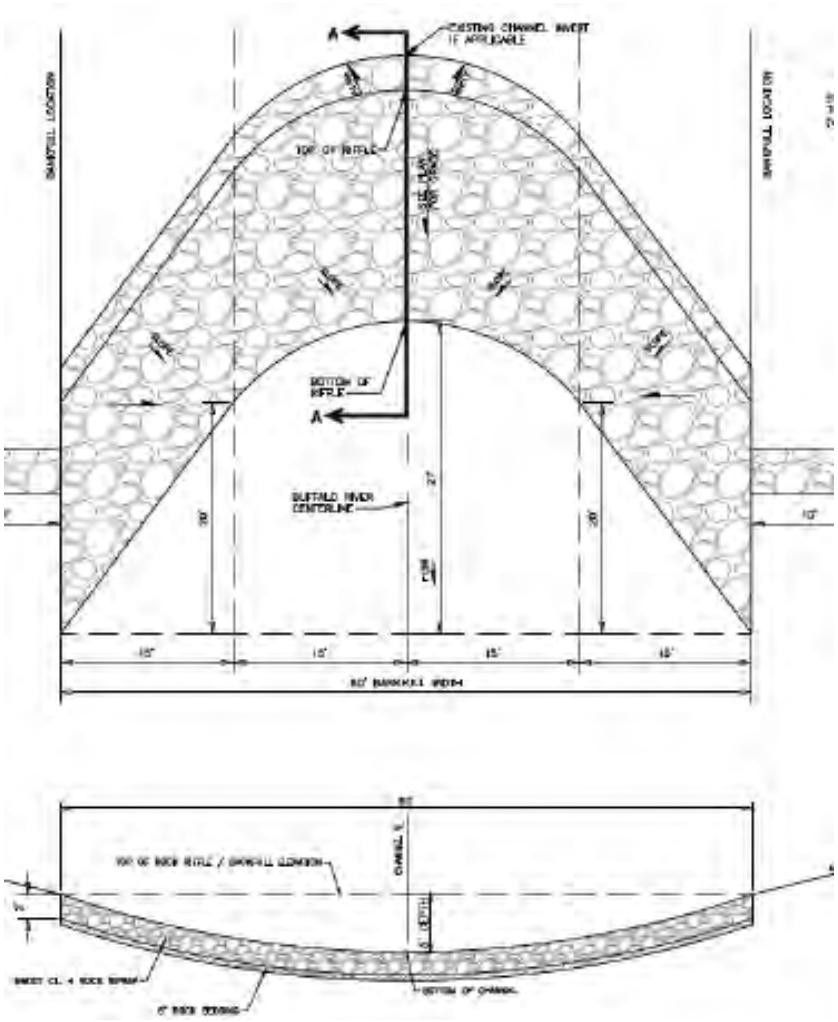


Figure 26. Example detail and photograph of riffle structure as built on the Buffalo River, MN

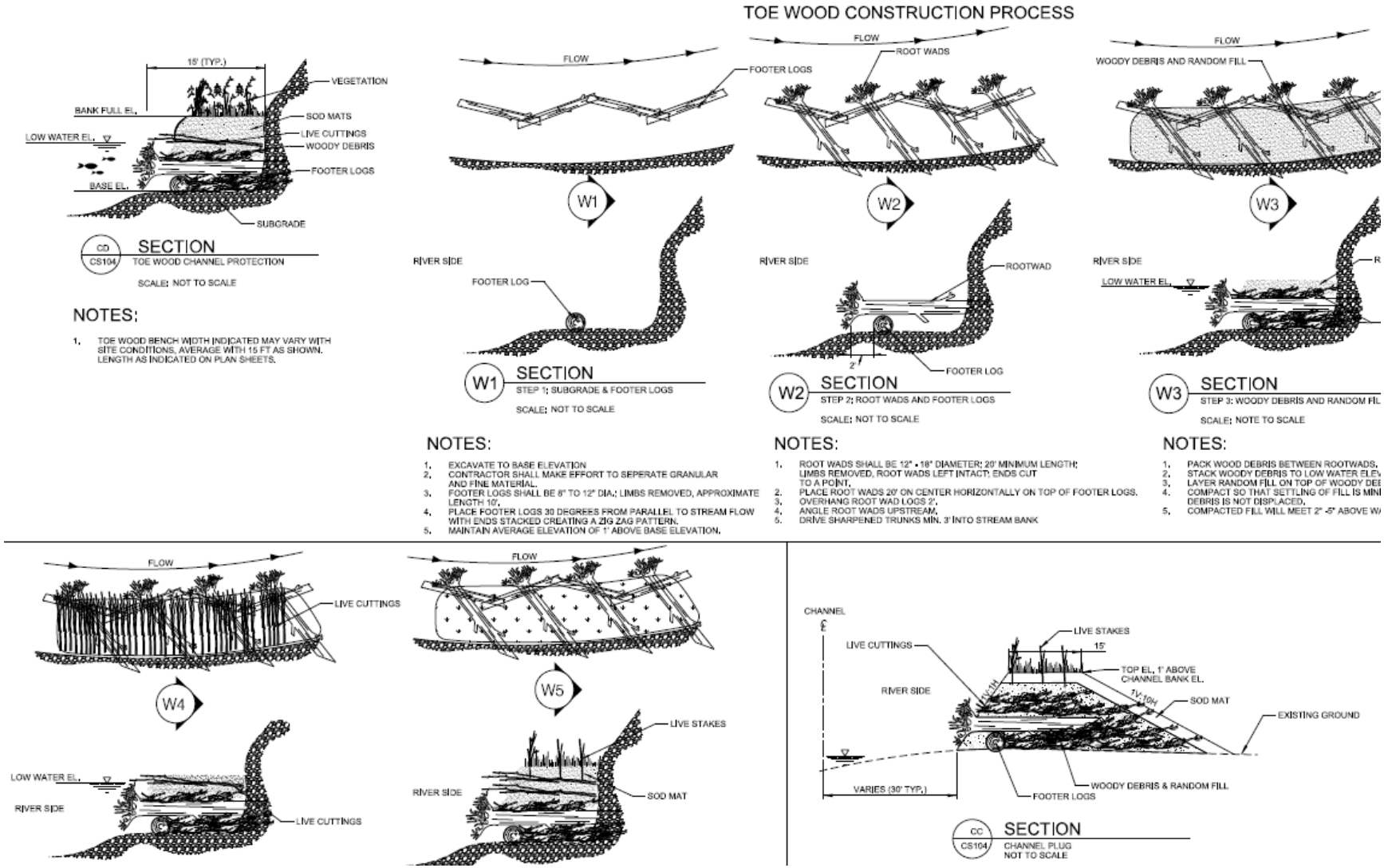


Figure 27. Naturalized bank stabilization proposed for the Pomme de Terre River

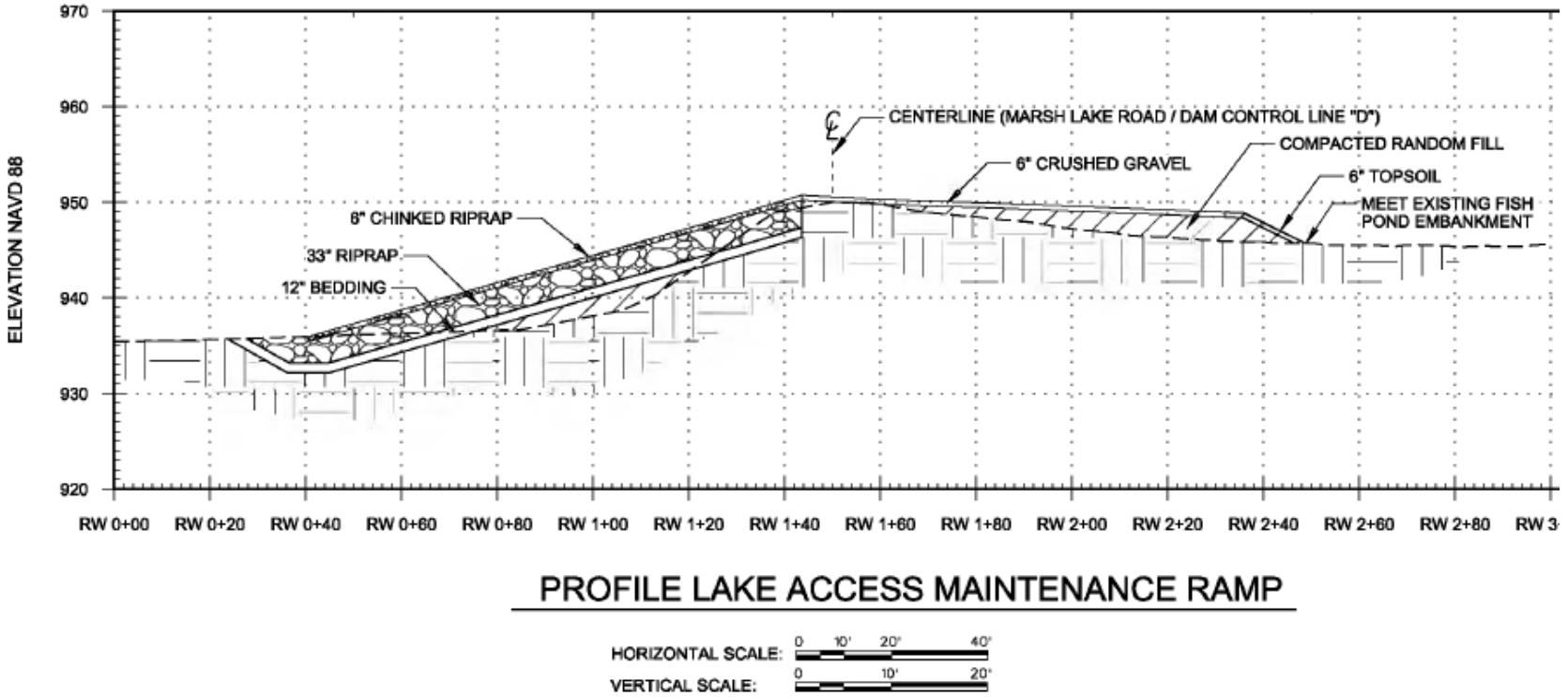


Figure 28. Profile of the Marsh Lake access maintenance ramp

Figure 29. Area where the dam access road re-route will result in lost hydrologic connectivity between Marsh Lake and a backwater pond and remnant floodplain

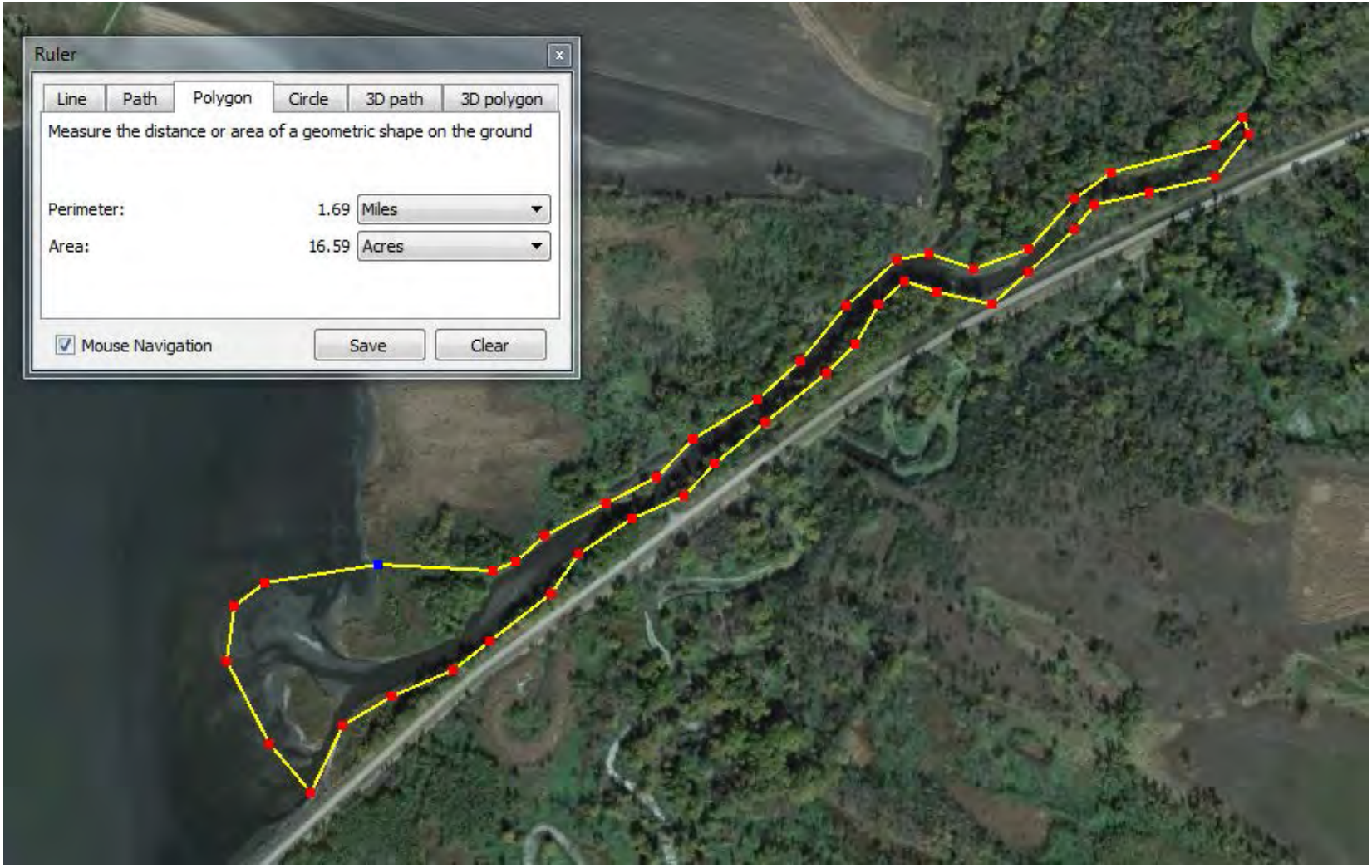


Figure 30. Area of the PdT River below Embankment A.

Appendix B:

Federally-Listed Threatened, Endangered, Proposed, and Candidate Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Ecological Services Field Office
4101 AMERICAN BLVD E
BLOOMINGTON, MN 55425
PHONE: (612)725-3548 FAX: (612)725-3609
URL: www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E19000-2016-SLI-0095 January 19, 2016
Event Code: 03E19000-2016-E-00030
Project Name: Marsh Lake Ecosystem Restoration Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the action area – the area that is likely to be affected by your proposed project. The list also includes designated and proposed critical habitat that overlaps with the action area. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representatives) must consult with the Service if they determine their project may affect listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains

step-by-step instructions that will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within the action area.

Although no longer protected under the Endangered Species Act, be aware that bald eagles (*Haliaeetus leucocephalus*) are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act *(*16 U.S.C. 703 *et seq*), as are golden eagles (*Aquila chrysaetos*). Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near a bald eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html. The information available at this website will help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Marsh Lake Ecosystem Restoration Project

Official Species List

Provided by:

Twin Cities Ecological Services Field Office
4101 AMERICAN BLVD E
BLOOMINGTON, MN 55425
(612) 725-3548
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E19000-2016-SLI-0095
Event Code: 03E19000-2016-E-00030

Project Type: ** OTHER **

Project Name: Marsh Lake Ecosystem Restoration Project
Project Description: Marsh Lake Dam, Swift and Lac qui Parle counties, Minnesota. Geographic area includes Marsh Lake dam, lower Pomme de Terre River, and all of Marsh Lake. Project proposed to be constructed in fall, 2016 through 2018, dependent on funding.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

United States Department of Interior
Fish and Wildlife Service

Project name: Marsh Lake Ecosystem Restoration Project

Project Location Map:

Project Coordinates: MULTIPOLYGON (((-96.2021255493164 45.223402656548366, -96.21053695678711 45.221347171208436, -96.2127685546875 45.2174778207308, -96.20933532714844 45.210343015478635, -96.1904525756836 45.19570781793794, -96.18032455444336 45.1936513315257, -96.17534637451172 45.1907479300741, -96.15028381347656 45.18348877843228, -96.12934112548828 45.1776807905905, -96.11114501953125 45.16981486267632, -96.10084533691405 45.16691024542675, -96.09638214111328 45.165699944524086, -96.08007431030273 45.17526062079539, -96.0670280456543 45.18022185817286, -96.06170654296875 45.179858855461234, -96.06222152709961 45.18360977187883, -96.07423782348631 45.18590859850545, -96.09312057495117 45.18820733230158, -96.10118865966795 45.18772339605894, -96.10651016235352 45.19135281759104, -96.11166000366211 45.194135217367354, -96.1219596862793 45.19643361892847, -96.13122940063477 45.200788230468284, -96.13861083984375 45.199699608826734, -96.14564895629883 45.207682350504335, -96.16607666015625 45.21518026929742, -96.18375778198241 45.222435378586816, -96.19474411010742 45.224490824583484, -96.2021255493164 45.223402656548366)))

United States Department of Interior
Fish and Wildlife Service

Project name: Marsh Lake Ecosystem Restoration Project

Endangered Species Act Species List

There are a total of 2 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Insects	Status	Has Critical Habitat	Condition(s)
Dakota Skipper *(Hesperia dacotae)*	Threatened	Final designated	
Mammals			
Northern long-eared Bat *(Myotis septentrionalis)*	Threatened		

IPaC - Information, Planning, and Conservation System

Environmental Conservation Online System

IPaC Home Page | Initial Project Scoping | Project Builder | Updated Species List | FAQs

Step 1
Location

Step 2
Activities

Step 3
Trust resources list

Step 4
Conservation measures

Trust Resources List

Back | Continue

An online Endangered Species Act species list IS available below for your project area, represented by the office(s) listed:

Twin Cities Ecological Services Field Office
4101 AMERICAN BLVD E
BLOOMINGTON, MN 55425
(612) 725-3548
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

The Endangered Species Act species list below is for planning purposes only – it is not an official species list.

To save or print all Trust Resources lists on this page, click here:

Save or Print Trust Resources List

To request an official species list, click here:

Project Location Map:

Note: The map reflects the map layers selected on the Step 1 Location page. To change what appears on this map return to the Location page and adjust the map layers.

Project Counties:
Big Stone, MN | Chippewa, MN | Lac qui Parle, MN | Swift, MN

Project type: Stream / Waterbody / Canals / Levees / Dikes

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **2** threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Insects	Status		Has Critical Habitat	Contact
Dakota Skipper (*Hesperia dacotae*)	Threatened	species info	Proposed critical habitat	Twin Cities Ecological Services Field Office
Mammals				
northern long-eared Bat (*Myotis septentrionalis*) Population:	Proposed Endangered	species info		Twin Cities Ecological Services Field Office

Appendix C:

Hazardous, Toxic, and Radioactive Waste Documentation Report

MINNESOTA RIVER SYSTEM

MARSH LAKE ECOSYSTEM RESTORATION

PROJECT

PHASE I

ENVIRONMENTAL SITE

ASSESSMENT REPORT

Project Site:

Marsh Lake

Minnesota and Pomme de Terre Rivers

Swift County and Chippewa, Minnesota

Prepared by:

United States Army Corps of Engineers – St. Paul District

Geotechnical, Geology, and Surveys Section

180 5th Street E.

St. Paul, Minnesota 55101

May 15, 2015

Note: Appendices to the HTRW Report available upon request.

TABLE OF CONTENTS

List of Acronyms

- ACM - Asbestos Containing Material
- AST - Aboveground Storage Tank
- ASTM – American Society for Testing Materials
- CAT - Illinois State Category List
- CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System
- CONSENT - Superfund Consent Decrees
- CORRACTS - Corrective Action Sites
- EDI - Environmental Design International
- EDR - Environmental Data Resources
- ERNS - Emergency Response Notification System
- ESA - Environmental Site Assessment
- FINDS - Facility Index System
- FOIA - Freedom of Information Act
- FTTS INSP - Federal Insecticide, Fungicide, & Rodenticide Act/ TSCA Tracking System
- HMIRS - Hazardous Materials Information Reporting System
- LQG - Large Quantity Generators
- LUST - Leaking Underground Storage Tank List
- NPL - National Priorities List
- NPL LIENS - Federal Superfund Liens
- NWI - National Wetlands Inventory
- PADS - PCB Activity Database System
- PCBs - Polychlorinated Biphenyls
- PDF – Portable Digital Format
- RAATS - RCRA Administrative Action Tracking System
- RCRIS - Resource Conservation and Recovery Information System
- REC – Recognized Environmental Condition
- ROD - Records of Decision
- SQG - Small Quantity Generators
- SSTS - Section 7 Tracking Systems
- TRIS - Toxic Chemical Release Inventory System
- TSCA - Toxic Substances Control Act Inventory
- TSD - Treatment, Storage, and Disposal
- USGS – United States Geological Survey
- UST - Underground Storage Tank

EXECUTIVE SUMMARY

A Phase I Environmental Site Assessment (ESA) was conducted for property located at the proposed site, which is located at the marsh Lake Dam on the Minnesota River at the confluence with the Pomme du Terre River. The project is located in Swift And Chippewa Counties, Minnesota, and is encompassed within T120N, R43W, sections SE ¼ of 19, S ½ of 20 and all of sections 29 and 30.

Property reconnaissance was conducted at the site on the week of 19 January, 2015 in conjunction with soil borings. The inspection and review of available records revealed the following:

Site History

The subject property is located on the Minnesota River at the confluence with the Pomme de Terre River.

The subject property and its environs up to a radius of 1 mile underwent a search of federal, state, local and tribal environmental databases in an effort to identify any potential environmental conditions of concern. No recognized environmental conditions were identified through the database search.

Historical land use and any potential environmental conditions may be identified through the study of aerial photographs, and U.S.G.S. topographic maps. A map and photo search was undertaken and no recognized environmental conditions were identified through this search.

The subject property was visually inspected during the week of 19 January, 2015. No recognized environmental conditions were identified during the inspection and nothing was observed to constitute a significant environmental risk at the site.

The Executive Summary provides a brief overview of the findings of this environmental site assessment. It should be noted that the complete report must be read in order to fully understand the findings associated with the subject properties.

PURPOSE

The purpose of this assessment was to identify recognized environmental conditions and potential environmental conditions based on a visual inspection of the subject property and the surrounding area, and a review of available public records relative the subject property. A recognized environmental condition is defined by ASTM Standard Practice E-1527 and E-2247 as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. This assessment does not intend to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

The Phase I ESA is in conformance with the scope of ASTM Standard Practice E-1527. The scope of work is further defined below.

A. COE has gathered and reviewed available historical data, including fire insurance mapping, plats of survey maps, soil survey aerial photography, topographic maps from the United States Geological Survey (USGS), and interviews with knowledgeable persons.

B. COE has reviewed state and federal environmental databases including UST, LUST, RCRA, CERCLA, NPL, Landfill, ERNS, CORRACTS, PADS, TRIS, DOCKET, TSCA, and SWF.

C. COE has physically inspected the subject property via walking and windshield survey, looking for signs of recognized environmental conditions such as stressed vegetation, unusual staining, dumping, and evidence of ASTs and USTs.

D. COE has physically observed adjacent properties, paying particular attention to evidence of USTs, questionable housekeeping practices or unusual business practices.

E. COE has reviewed all available historical data, database information, received FOIA information, and the results of the site inspections.

The conclusions and recommendations stated in this report are based upon observations made by individuals working for the Corps of Engineers, and also upon information provided by others.

We have accepted as true and accurate the information provided by other sources; therefore we cannot be held responsible for the accuracy of this information.

The Phase I Assessment was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the environmental profession under similar conditions. No other warranty or guarantee, express or implied, is included or intended in this report or otherwise.

The Scope of this Assessment does not purport to encompass every report, record, or other form of documentation relevant to the Property being evaluated. The observations contained herein are made during the site reconnaissance, review of ownership records, discussions with local officials, and review of readily accessible environmental databases. This Phase I Assessment is based on our professional judgment concerning the significance of the data collected and in no way attempts to forecast the future site conditions.

SITE DESCRIPTION

Property Location

The subject property is located at the Marsh Lake Dam on the Minnesota River at the confluence with the Pomme du Terre River. The project is located in Swift and Chippewa Counties, Minnesota, and is encompassed within Township120N, Range 43W, sections SE ¼ of 19, S ½ of 20 and all of sections 29 and 30. The project is located approximately 4 miles west of Appleton Minnesota and 14 miles upstream of Lac Qui Parle Dam.

General Site Setting

The U.S. Army Corps of Engineers or the State of Minnesota owns the land in the area of the project. Land use in the area of the subject property is riverine, backwater marshes, crop land, flood plain forest and upland prairie (crops). The closest town in proximity is Appleton, Minnesota with a population of approximately 1412 (2010 census), and a total population of 9,546 in all of Swift County.

Current Use of Adjoining Properties

The adjoining properties are limited in number and are agricultural crop land. There are two farmsteads within ½ mile the project. One is located in the NE ¼ of the SW ¼ of section19, and NE ¼ of the SE ¼ of section 20. No manufacturing is located in the immediate vicinity.

Owner Provided Information

The Corps of Engineers or the State of Minnesota owns all of the land in the area of the project. I conducted a personal interview with Randy Melby the current site supervisor. He stated that he has no recollection of any spills or any other environmental concerns during his tenure and has thorough knowledge of the historical files at the site.

HISTORICAL USE OF THE PROPERTY

The property is contained within the Minnesota River flood plain. Prior to the dam construction in the 1930's it was agricultural land and flood plain. There is a DNR fish pond that has been unused for many years (if the pond area is to be disturbed, samples should be obtained to check for metals in the sediment. Copper sulfate is a commonly used for control of algae.)

Sanborn Fire Insurance Maps

Historical Fire Insurance Sanborn Maps were requested from Environmental Data Resources, Inc. (EDR), Southport, Connecticut. Historical maps are detailed drawings that show the locations and use of structures on a given property during a specific year. The maps were originally used by insurance companies to assess fire risk. EDR had no coverage for the Sanborn maps. This is consistent with the areas rural character.

Topographic Maps

Historical topographic map coverage of project area was studied. Appleton (1958 and 1977) quadrangle maps were obtained along with Milbank 1985 series 1:100000 map. Topographic maps depict the subject property and adjacent properties as similar to what was observed at the time of the property reconnaissance.

- Partial copies of the topographic maps are provided in Appendix F3.
- No environmental conditions were identified from the topographic maps.

Aerial Photos

Historical photos of the property were requested from EDR. Photo coverage was available for the years 1938, 1956, 1961, 1980, 1992, 2006, 2008, 2009, and 2010. All photos reveal that that the land is similar to its present condition with the exception of the 1938 photo. 1938 photo shows the CCC Camp used to build the marsh Lake Dam Project. All other photos show that land is agricultural or in a natural state, and rural in character the camp had been removed.

Radius

- Copies of the aerial photos are provided in Appendix F2.
- No environmental conditions were identified from the aerial photographs.

REGULATORY REVIEW

A Government Records Search Radius Map Report was requested for the subject property from Environmental Data Resources, Inc. (EDR). The EDR Radius Map Report maps sites with potential or existing environmental liabilities. The following is a list of the databases searched for the subject property accompanied by a summary of sites listings. Copies of the EDR Radius Map Reports are provided in Appendix F4.

Federal Records:

- **NPL -** National Priorities List
- **NPL Proposed**
- **NPL LIENS -** Federal Superfund Liens
- **NPL Delisted**
- **CERCLIS (Active)** - Comprehensive Environmental Response, Compensation, and Liability Information System
- **CERCLIS (NFRAP)** - No Further Remedial Action Planned Archive

- **CORRACTS -** Resource Conservation and Recovery Information System (RCRIS) list of Treatment, Storage, and Disposal (TSD) Facilities, Corrective Action Sites
- **RCRA – TSDF** Resource Conservation and Recovery Act Information
- **RCRA – LQG** Resource Conservation and Recovery Act Information
- **RCRA – SQG** Resource Conservation and Recovery Act Information
- **ERNS -** Emergency Response Notification System
- **HMIRS** - Hazardous Materials Information Reporting System
- **US ENGINEERING CONTROLS**
- **US INSTITUTIONAL CONTROLS**
- **DOD** – Department of Defense
- **FUDS –** Formerly Used Defense Sites
- **US BROWNFIELDS**
- **CONSENT -** Superfund Consent Decrees
- **ROD -** Records of Decision
- **UMTRA** – Uranium Mill Tailings Sites
- **ODI** – Open Dump Inventory
- **TRIS** – Toxic Chemical Release Inventory System
- **TSCA** – Toxic Substances Control Act
- **FTTS** - Federal Insecticide, Fungicide, & Rodenticide Act/ TSCA Tracking System
- **SSTS** – Section 7 Tracking Systems
- **RADINFO** – Radiation Information Database
- **LUCIS** – Land Use Control Information System
- **ICIS** – Integrated Compliance Information System
- **DOT OPS** – Incident and Accident Data
- **LIENS 2** – CERCLA Lien Information
- **US CDL** – Clandestine Drug Labs
- **HIST FTTS** – FIFRA/TSCA Tracking System Administrative Case Listing
- **PADS** – PCB Activity Database System
- **MLTS** – Material Licensing Tracking System
- **MINES** – Mines Master Index File
- **FINDS** – Facility Index System/Facility Registry System
- **RAATS** – RCRA Administrative Action Tracking System

State and Local Records:

- **SHWS** – Hazard Ranking List
- **BRRTS** – Bureau of Remediation & Redevelopment Tracking System
- **SWF/LF** – List of Licensed Landfills
- **LUST** – Leaking Underground Storage Tank Database
- **UST** – Registered Underground Storage Tanks
- **LAST** – Leaking Aboveground Storage Tank Listing
- **AST** – Tanks Database
- **WI MANIFEST** – Hazardous Waste Manifest Data
- **AGSPILLS** – Agricultural Spill cases
- **CRS** – Closed Remediation Sites
- **AUL** – Deed Restriction at Closeout Sites
- **VCP** – Voluntary Party Liability Exemption Sites

- **DRYCLEANERS** – Five Star Recognition Program Sites
- **BEAP** – Brownfields Environmental Assessment Program
- **AIRS** – Air Permit Program Listing
- **TIER 2** – Tier 2 Facility Listing
- **SHWIMS** – Solid & Hazardous Waste Information Management System
- **LEAD** – Lead Inspection Data

Tribal Records:

- **INDIAN RESERV** – Indian Reservations
- **INDIAN LUST** – Leaking Underground Storage Tanks on Indian Land
- **INDIAN UST** – Underground Storage Tanks on Indian Land

EDR Proprietary Records:

- **Manufactured Gas Plants** – EDR Proprietary Manufactured Gas Plants

The search was conducted for a radius of 1.5-miles from the center of the embankment. The target property was not listed in any of the databases checked.

PROPERTY RECONNAISSANCE

19-26 January, 2015

Kevin S. Nelson from the US Army Corps of Engineers, St. Paul District conducted the property reconnaissance. During the week of 19 January 2015 a site visit was made in conjunction with soil borings. Photos of the site are located in appendix F1. It was noted that a fish pond is located downstream of west side embankment. There is a potential for heavy metals to be

present in the sediments within the pond. Sulfide metals are known to have been have been used for algae control in fish ponds.

The subject property is located on the east bank of the Minnesota River, and is bisected by the Pomme du Terre River, in Swift and Lac Qui Parle Counties, Minnesota. The area in question was natural flood plain forest, embankment and plowed fields. Mapping prior to the construction shows that little has changed little over the years, and remains in its natural state. Other than the construction of the dam and access road to the boat launch there has been no development of the site. The nearest structures observed during the inspection were two farmsteads within ½ mile the project. One is located in the NE ¼ of the SW ¼ of section19, and NE ¼ of the SE ¼ of section 20.

The database search revealed no wells near the subject property. The entire site was free from litter or man-made debris.

No potential on-site recognized environmental conditions were observed during the property reconnaissance.

CONCLUSIONS

The Corps of Engineers have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of the Marsh Lake Dam project area This assessment revealed no evidence of recognized environmental conditions in connection with the subject property unless the project includes the “old fish pond” area where there is a chance for metals contamination.

.

Agricultural activities have historically been conducted at adjacent sites, along with effluent in the river water. Agricultural chemicals, including herbicides and pesticides, are expected to have been applied to the crops surrounding the river valley as well as effluent and industrial runoff to the river at various times throughout its history. The disseminated nature of these chemicals should not constitute a significant environmental risk at the site.

QUALIFICATIONS of the PROFESSIONAL RESPONSIBLE FOR THIS REPORT

The professional responsible for the preparation of this Phase I Environmental Site Assessment is identified below.

_____

Kevin S. Nelson P.G.

Geologist

Mr. Nelson has over 20 years experience in drilling, sampling, environmental and geotechnical engineering support.

Appendix D:

Agency and Public Coordination

Minnesota Pollution Control Agency

Minnesota State Historic Preservation Office

Minnesota Department of Natural Resources

Upper Minnesota River Watershed District

U.S. Fish and Wildlife Service

U.S. Environmental Protection Agency

Just Ducks

Ducks Unlimited

Concerned Citizens

From: Wilde, William (MPCA)
To: Potter, David F MVP
Subject: [EXTERNAL] RE: Marsh Lake Ecosystem Restoration Project & water quality certification
Date: Wednesday, July 15, 2015 11:37:36 AM

Hi David

Thank you for the follow-up.

At this juncture the MPCA does not anticipate any major issues in the construction and completion of the Marsh Lake Ecosystem Restoration project. However, when project begins, among other condition, the applicant must use in-water BMP's that will reduced and/or eliminated sediment from entering Marsh Lake, Pomme de Terre River, and Minnesota River. Depending on location all waters are currently impaired for one or more of the following impairments: turbidity, dissolved oxygen, aquatic life, et.el. This project will not exacerbate these impairments.

As mentioned below, a final certification letter cannot be sent until after the EAW review is complete and record of decision is issued.

Please contact me if additional or more detailed information is needed.

Thanks again,

Bill Wilde
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155
(651) 757-2825

-----Original Message-----
From: Potter, David F MVP [mailto:David.F.Potter@usace.army.mil]
Sent: Tuesday, July 14, 2015 3:37 PM
To: Wilde, William (MPCA)
Cc: Khazrajafari, Shahin MVP
Subject: Marsh Lake Ecosystem Restoration Project & water quality certification

Hi Bill:

See attachments, per your request.

The EAW/ROD that was completed by MNDNR was for the project as described in the 2011 Feasibility Report/Integrated EA. In an effort to save cost, there has been several modifications to the project, the most significant of which was eliminating the bridge on the embankment, and re-routing the dam access road. These modifications are what triggered the need for the recently released draft Supplemental EA. I anticipate the Supplemental EA will be finalized this fall/winter. Project construction will likely not begin until fall/winter of 2016.

As I mentioned, we are close to a 95% design for said project. In an effort to further reduce costs, additional modifications from that described in the Supplemental EA may be necessary:

1) No culverts will be replaced on the Louisburg Road;
2) The Water Control Structure will likely be reduced down to 6 bays instead of 7.

Once I get a definite understanding of all project components, I will apply for a Protected Waters Permit from the Minnesota DNR. I am under the understanding that this action will likely trigger a revised EAW/ROD on their behalf.

I also understand that MNPCA cannot provide us with 401 water quality certification until the Supplemental EA/FONSI is finalized. However, in the meantime, could the MPCA provide an informal indication that they do not anticipate major issues from precluding its issuance based on the fact that the project has been reduced in size? I think this is how we have handled this in the past, which would allow the project to proceed as we go through our internal review process. If this is acceptable, I think I can dig up some of the language we have used in the past.

David Potter, Fishery Biologist
US Army Corps of Engineers, St. Paul District
180 5th Street East
St. Paul, MN 55101
Tel: 651.290.5713

-----Original Message-----
From: Potter, David F MVP
Sent: Thursday, April 30, 2015 2:05 PM
To: Alice Hanley (alice_hanley@fws.gov)
Subject: FW: Marsh Lake Draft Supplemental EA and Revised CWA 404

Sorry- forgot to add you.

dp

-----Original Message-----
From: Potter, David F MVP
Sent: Thursday, April 30, 2015 12:38 PM
To: Chris Domeier, david.trauba@state.mn.us; Hansel-Welch Nicole; Heather Kieweg; Ken Varland; Luther Aadland; Mike Davis; Radermacher Dianne; Soupir, Gregg M (DNR); Skaar, Kent (DNR); Dummer, Kathy (DNR); 'andrew_horton@fws.gov'; 'ryan.bjerke@state.mn.us'; Karen Kromar (karen.kromar@state.mn.us); Tyler Hastings (tyler.hastings@state.mn.us)
Cc: Khazrajafari, Shahin MVP
Subject: Marsh Lake Draft Supplemental EA and Revised CWA 404

All:

Attached are the public notice and draft Supplemental EA / Revised 404 Evaluation for the Marsh Lake Ecosystem Restoration Project for review.

It is also accessible via our website: http://www.mvp.usace.army.mil/Home/PublicNotices.aspx

We ask that comments be provided by 1 June 2015.

Feel free to distribute or let me know who else I may have missed.

Thank you,

David Potter, Fishery Biologist

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

REPLY TO
ATTENTION OF

December 22, 2010

Regional Planning and Environment Division North
Environmental and GIS Branch

SUBJECT: Signed Memorandum of Agreement for Marsh Lake Ecosystem Restoration Project, Swift, Lac qui Parle and Big Stone Counties, Minnesota

Dr. Tom McCulloch
Office of Federal Agency Programs
Advisory Council on Historic Preservation
Old Post Office Building, Suite 803
1100 Pennsylvania Avenue, NW
Washington, D.C. 20004

Dear Dr. McCulloch:

The St. Paul District, U.S. Army Corps of Engineers (Corps) and the Minnesota State Historic Preservation Officer (SHPO) have prepared the enclosed Memorandum of Agreement to cover the Corps' Section 106 responsibilities to mitigate adverse effects to the National Register of Historic Places-eligible Marsh Lake Dam resulting from the proposed Marsh Lake Ecosystem Restoration Project. The director of Region IV (Southern Region) of the Minnesota Department of Natural Resources (DNR), as the Project's non-Federal sponsor, has signed the MOA as a concurring party.

The Corps is submitting the enclosed original-signature final MOA to the Advisory Council in order to comply with Section 106 of the National Historic Preservation Act and 36 CFR Part 800, paragraph 800.6(b)(1)(iv). Both the Minnesota SHPO and the Minnesota DNR are being sent copies of the signed MOA. The actual mitigation documenting Marsh Lake Dam will be conducted under a Corps' contract in the spring or early summer of 2011. If you have any questions or comments on the Project or the enclosed MOA, please contact Ms. Virginia Gnabasik, St. Paul District Corps archeologist, at (651) 290-5262 or by email at virginia.r.gnabasik@usace.army.mil.

Sincerely,

Randall D. Devendorf
Acting Chief, Environmental and GIS Branch

Enclosure
Original signature copy of MOA

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

REPLY TO
ATTENTION OF

December 22, 2010

Regional Planning and Environment Division North
Environmental and GIS Branch

SUBJECT: Signed Copy of Memorandum of Agreement for the Marsh Lake Ecosystem Restoration Project, Big Stone, Lac qui Parle and Swift Counties (SHPO Number 2009-0850 Final MOA)

Ms. Mary Ann Heidemann, Manager
Government Programs and Compliance
State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Boulevard West
St. Paul, Minnesota 55102-1906

Dear Ms. Heidemann:

Enclosed for your records is a copy of the signed *Memorandum of Agreement Between the U.S. Army Corps of Engineers, St. Paul District, and the Minnesota State Historic Preservation Officer Regarding Mitigation of Adverse Effects to Marsh Lake Dam Resulting From the Marsh Lake Ecosystem Restoration Project, Swift, Lac qui Parle and Big Stone Counties, Minnesota* (MOA). The original signature copy of the MOA is being filed with the Advisory Council on Historic Preservation per 36 CFR Part 800, Protection of Historic Properties, paragraph 800.6(b)(1)(iv). A copy is also being sent to the Minnesota Department of Natural Resources, Region IV office, as that regional office handles the Lac qui Parle Wildlife Management Area at Marsh Lake and is the non-Federal sponsor for the Project.

The point of contact for implementing the MOA at the St. Paul District, U.S. Army Corps of Engineers is Ms. Virginia Gnabasik, District archeologist, who can be reached at (651) 290-5262 or by email at virginia.r.gnabasik@usace.army.mil. On November 15, 2010, Ms. Kelly Gragg-Johnson of your office should have received an email from the Office of Federal Agency Programs containing a pdf of the Advisory Council's letter to the Corps regarding their decision not to participate in the Project's MOA.

Sincerely,

Randall D. Devendorf
Acting Chief, Environmental and GIS Branch

Enclosure
Signed copy of MOA

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

REPLY TO
ATTENTION OF

December 22, 2010

Regional Planning and Environment Division North
Environmental and GIS Branch

SUBJECT: Signed Copy of Memorandum of Agreement for the Marsh Lake Ecosystem Restoration Project, Big Stone, Lac qui Parle and Swift Counties

Mr. Mark Matuska
Regional Director, Region IV
Minnesota Department of Natural Resources
261 Highway 15 South
New Ulm, Minnesota 56073

Dear Mr. Matuska:

Enclosed for your records is a copy of the signed *Memorandum of Agreement Between the U.S. Army Corps of Engineers, St. Paul District, and the Minnesota State Historic Preservation Officer Regarding Mitigation of Adverse Effects to Marsh Lake Dam Resulting From the Marsh Lake Ecosystem Restoration Project, Swift, Lac qui Parle and Big Stone Counties, Minnesota* (MOA). The original signature copy of the MOA is being filed with the Advisory Council on Historic Preservation per 36 CFR Part 800. Protection of Historic Properties, paragraph 800.6(b)(1)(iv). A copy is also being sent to the Minnesota State Historic Preservation Office at the Minnesota Historical Society in St. Paul.

The point of contact for implementing the MOA at the St. Paul District, U.S. Army Corps of Engineers is Ms. Virginia Gnabasik, District archeologist, who can be reached at (651) 290-5262 or by email at virginia.r.gnabasik@usace.army.mil.

Sincerely,

Randall D. Devendorf
Acting Chief, Environmental and GIS Branch

Enclosure
Signed copy of MOA

**MEMORANDUM OF AGREEMENT
BETWEEN THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT,
AND THE MINNESOTA STATE HISTORIC PRESERVATION OFFICER
REGARDING MITIGATION OF ADVERSE EFFECTS TO MARSH LAKE DAM
RESULTING FROM THE MARSH LAKE ECOSYSTEM RESTORATION PROJECT,
SWIFT, LAC QUI PARLE AND BIG STONE COUNTIES, MINNESOTA**

[Final – November 2010]

WHEREAS, the St. Paul District, U.S. Army Corps of Engineers (Corps) is conducting a feasibility study of ecosystem restoration measures at Marsh Lake on the Minnesota River in Swift, Lac Qui Parle, and Big Stone Counties, Minnesota; and

WHEREAS, the State of Minnesota, Department of Natural Resources (DNR) is the main landowner around Marsh Lake, as the Lac Qui Parle Wildlife Management Area, and is the non-Federal sponsor of this ecosystem restoration feasibility study; and

WHEREAS, the Corps and Minnesota DNR are proposing an ecosystem restoration project at Marsh Lake on the Minnesota River (Project) with the following primary features (a-g) and optional features (h-j) (see Figures 1 and 2):

a. Restoring the Pomme de Terre River to its former (pre-dam) channel by excavating an opening through the Marsh Lake Dam embankment and constructing three earthen berms or cutoff dikes across two low areas and the abandoned diverted river channel above the dam embankment to prevent Marsh Lake from spilling into the restored river channel;

b. Constructing a bridge over the restored Pomme de Terre River channel at the embankment to allow continued vehicle access to the dam;

c. Modifying Marsh Lake Dam at its outlet by excavating a 2.1-foot-deep, 30-foot-wide notch into the existing fixed ogee crest spillway and constructing a nine-tier rock-ramp fishway to allow fish passage between Marsh Lake and the Lac Qui Parle Reservoir downstream;

d. Constructing a new 90-foot-wide gated water control structure with 12 bays at the existing emergency spillway to enable future water level management of Marsh Lake;

e. Adding walkways over the existing fixed crest spillway and fishway and over the gated water control structure to allow access across the entire dam, which walkways could serve a secondary recreational purpose as part of the Minnesota River State Trail for pedestrian and bicycle traffic;

f. Breaching the abandoned fish rearing pond levee below the dam embankment to allow it to change water level with the rest of upper Lac Qui Parle Reservoir to provide seasonally variable habitat for fish and shorebirds;

g. Constructing three linear, rock wave-barrier islands in Marsh Lake between the dam and Louisburg Grade Road to reduce wind fetch and thereby shoreline erosion;

h. Adding stoplog structures to the six concrete culverts through Louisburg Grade Road to enable separate water level management in upper Marsh Lake;

i. Improving the recreation area at Marsh Lake Dam, including adding an interpretive kiosk, adding a canoe and kayak landing/launch area near the spillway for access to the Pomme

de Terre River and Minnesota River/upper Lac qui Parle Reservoir, and adding shoreline fishing and wildlife viewing platforms; and,

j. Improving recreational and educational features at six existing boat ramps (Upper Pool Landing, Minnesota River Landing, Correll Landing, Killen Landing, Cabin Site Landing, and Peterson Landing) on Marsh Lake by adding interpretative kiosks and shoreline fishing/wildlife viewing platforms. Additional parking would also be provided at the Minnesota River Landing.

WHEREAS, Marsh Lake Dam (SW-APT-003) has been determined individually eligible to the National Register of Historic Places under Criterion A for its association with the Lac Qui Parle Flood Control Project, a Works Progress Administration project of the Federal Relief Programs following the Great Depression in 1929, and retains its integrity of original location, design, setting, materials, workmanship, feeling and association, and will be directly affected by proposed ecosystem restoration features a, b, c, and d, and restoration/recreation feature e, which will substantially change the historic setting of the dam and the way the dam operates and;

WHEREAS, proposed ecosystem restoration features c and d will also change the way Marsh Lake Dam is operated;

NOW, THEREFORE, the Corps, the Minnesota Department of Natural Resources, and the Minnesota State Historic Preservation Officer (SHPO) agree that upon filing this Memorandum of Agreement (MOA) with the Advisory Council on Historic Preservation, and upon the Corps' decision to proceed with the Marsh Lake ecosystem restoration project, the Corps shall ensure that the following stipulations are implemented prior to construction in order to mitigate the effects of the undertaking on the National Register eligible Marsh Lake Dam and comply with Section 106 of the National Historic Preservation Act, as amended.

STIPULATIONS

The Corps, as the Federal agency undertaking the Project, shall ensure the following stipulations are complied with prior to construction of ecosystem restoration features a, b, c, d, and e to mitigate adverse effects to Marsh Lake Dam's integrity of design, setting, and feeling. The proposed spillway modifications will also substantially change the way the dam operates.

A. The Corps or its contractor will document the historic Marsh Lake Dam property in its original and present condition, using Level II documentation as described in the *Minnesota Historic Property Record Guidelines* (updated June 2009 version). Level II documentation consists of: 1) a Minnesota Historic Property Record (MHPR) Background Data Form; 2) a brief two-page narrative description of the historic property (i.e., Marsh Lake Dam, SW-APT-003), its history, and a bibliography; and 3) documentation photography (black-and-white, 35 mm Kodak TMAX ISO 100 print film) covering historic photographs of Marsh Lake Dam, of the existing dam with its embankment and related features, and of historic plans and drawings of Marsh Lake Dam. Photographic documentation will follow the requirements given in Appendix E in the MHPR Guidelines.

B. The Corps will provide copies of the completed MHPR Level II documentation for Marsh Lake Dam to the Minnesota SHPO, to the Minnesota DNR's Regional Office, to the Lac qui

Parle Wildlife Management Refuge, and to the Swift, Big Stone, and Lac Qui Parle County Historical Societies.

C. Dispute Resolution. Should any of the signatory parties to this MOA object to any plans, documents, or reports prepared under the terms of this MOA within 30 days after receipt, the Corps shall consult with the objecting party to resolve the objection. If the Corps determines that the objection cannot be resolved, the Corps shall forward all documentation on the dispute to the Advisory Council on Historic Preservation. Any recommendation or comment provided by the Advisory Council will be understood to pertain only to the subject of the dispute. The Corps' and the Minnesota DNR's responsibilities to carry out all actions under this MOA that are not the subject of the dispute will remain unchanged.

D. Amendments. Any signatory party to this MOA may request that it be amended, whereupon the parties will consult to consider such amendment.

E. Termination. Any signatory party to this MOA may terminate it by providing thirty (30) days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

F. Anti-Deficiency Provision. All obligations on the part of the Corps shall be subject to the availability and allocation of appropriated funds for such purposes. Should the Corps be unable to fulfill the terms of this agreement, it will immediately notify the Minnesota SHPO and the Minnesota DNR and consult to determine whether to amend or terminate the MOA pending the availability of resources.

G. Sunset Clause. This MOA will continue in full force and effect until the mitigation of adverse effects to the National Register-eligible Marsh Lake Dam by the proposed ecosystem restoration features has been completed as stipulated above, unless the proposed features are not constructed or authorization for their construction is rescinded.

Execution and implementation of this Memorandum of Agreement evidences that the Corps has satisfied its Section 106 responsibilities for all aspects of this undertaking.

ST. PAUL DISTRICT, U.S. ARMY CORPS OF ENGINEERS

BY: _____ Date: 22 November 2010
Col. Michael J. Price, District Engineer

MINNESOTA STATE HISTORIC PRESERVATION OFFICER

BY: _____ Date: 11/30/10
Britta Bloomberg, Deputy State Historic Preservation Officer

Concur:

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

BY: _____ Date: 12/14/10

Mark Matuska, Regional Director

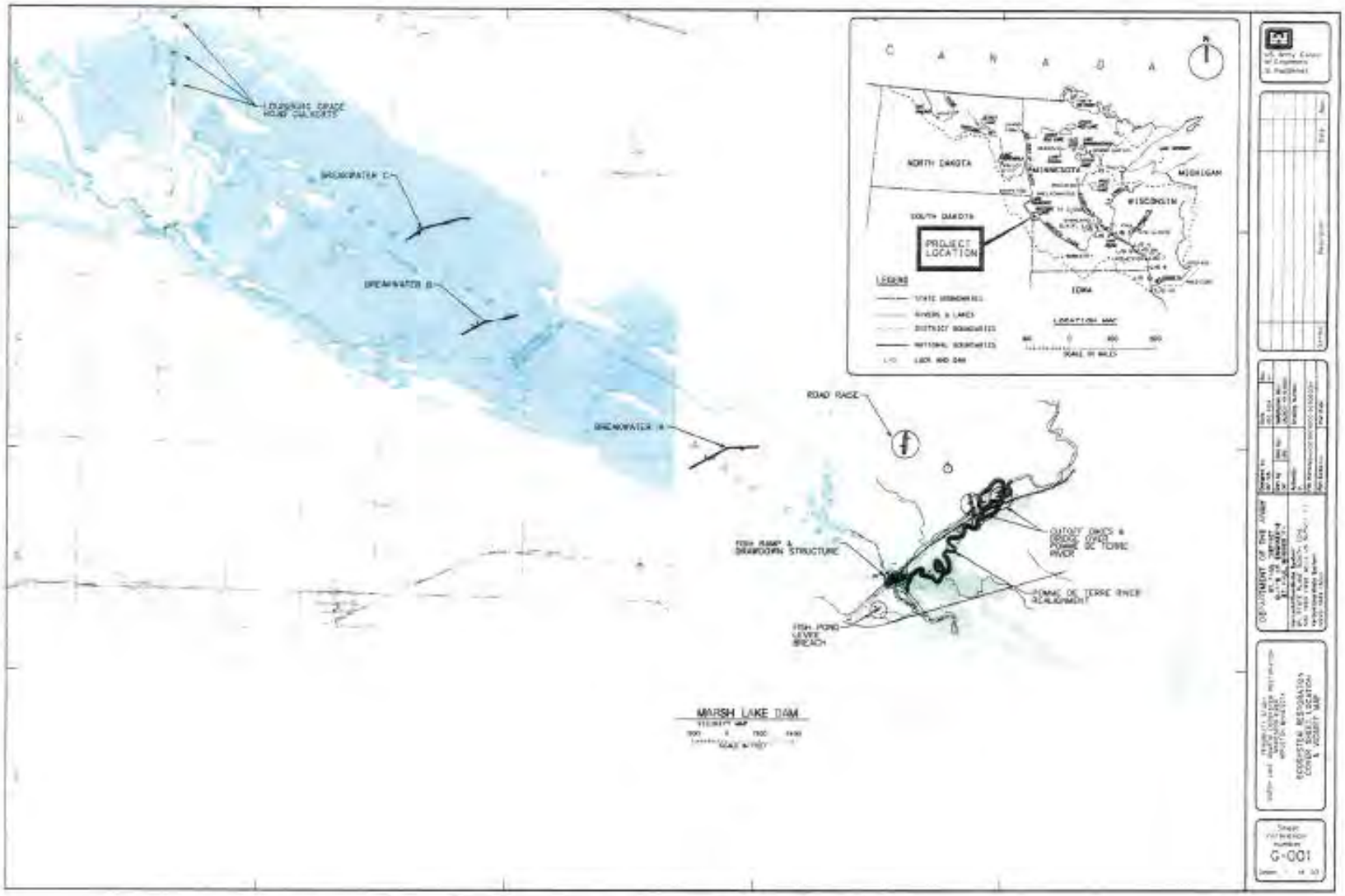


Figure 1. Marsh Lake Ecosystem Restoration Project, location of features a through h.

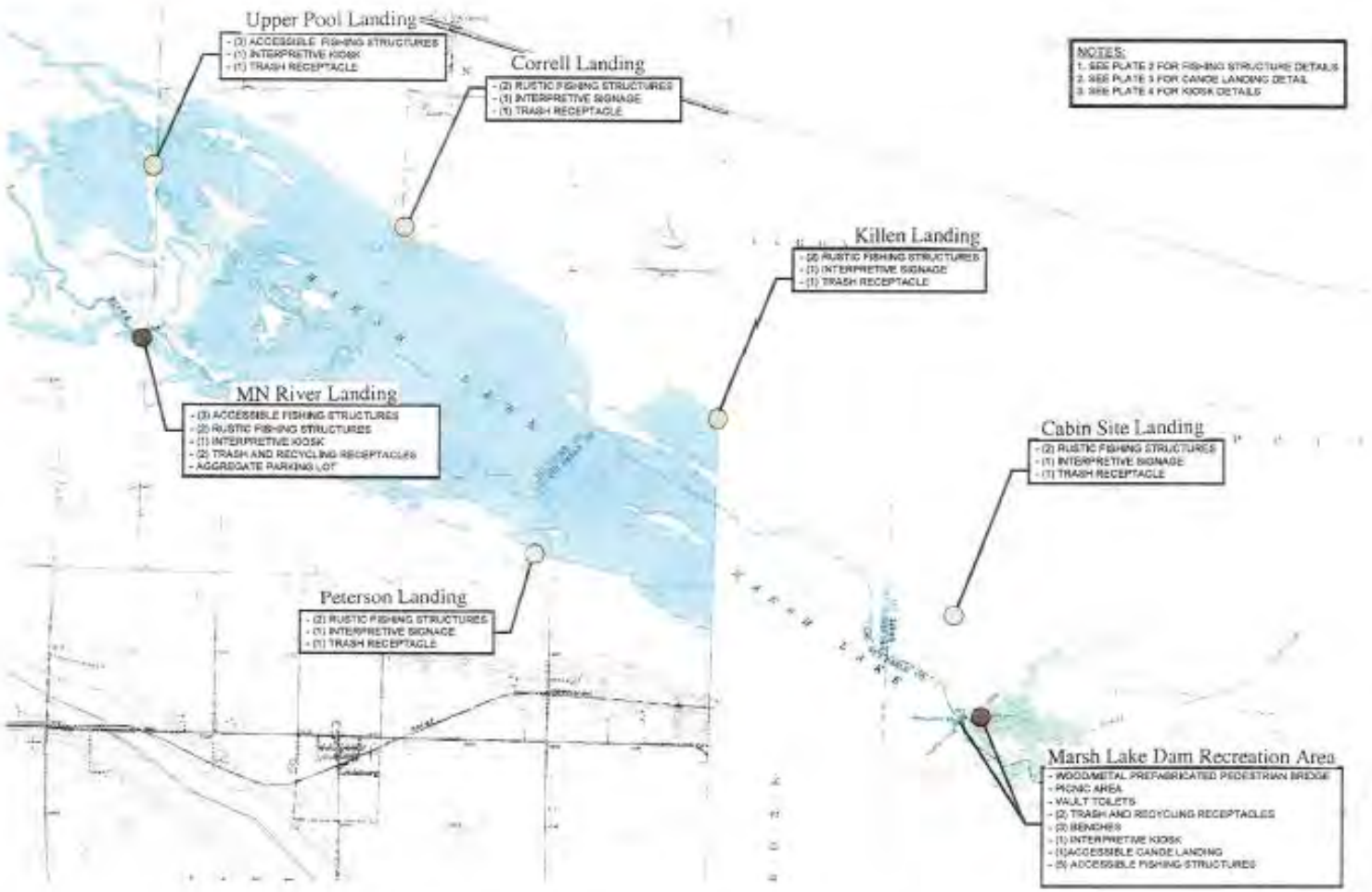


Figure 2. Marsh Lake Ecosystem Restoration Project, location of recreation features i and j.

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STATE HISTORIC PRESERVATION OFFICE

August 17, 2015

Mr. Terry Birkenstock, Deputy Chief
Regional Planning and Environment Division North
St. Paul District, Corps of Engineers
180 5th Street East, Suite 700
St. Paul, MN 55101-1638

RE: Marsh Lake Ecosystem Restoration Project
Draft Level II Minnesota Historic Property Record (MHPR) for the Marsh Lake Dam
Lac Qui Parle and Swift Counties
SHPO Number: 2009-0850 MOA

Dear Mr. Birkenstock:

Thank you for the opportunity to comment on the Draft Level II Minnesota Historic Property Record (MHPR) documentation for the Marsh Lake Dam. This documentation has been prepared pursuant to Stipulation A of the memorandum of agreement negotiated for the Marsh Lake Ecosystem Restoration Project. The draft photos and narrative appear to satisfy Stipulation A of the agreement and we look forward to receiving the final Level II MHPR documentation.

Please contact Kelly Gragg-Johnson, Review and Compliance Specialist, at (651) 259-3455 if you have any questions regarding our comments.

Sincerely,

Sarah J. Beimers, Manager
Government Programs and Compliance

cc: Brad Perkl, USACE Archaeologist

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

October 28, 2015

REPLY TO
ATTENTION OF

Regional Planning and Environment Division North

Ms. Sarah Beimers
Government Programs and Compliance
State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Boulevard West
St. Paul, MN 55102-1906

SUBJECT: Minnesota Historic Property Record Level II Documentation for Marsh Lake Dam, Lac qui Parle and Swift Counties, Minnesota. SHPO Number 2009-0850

Dear Ms. Beimers:

The St. Paul District, U.S. Army Corps of Engineers (Corps) is continuing the planning for an ecosystem restoration project (Project) at Marsh Lake on the Minnesota River near Appleton, Minnesota. Because some of the actions will alter the National Register of Historic Places eligible Marsh Lake Dam (MHPR No. XX-RVR-004 [former no.: LP-HAN-004, SW-APT-003]), a Level II historic property record documentation was completed and the final version was presented to your office on October 13, 2005. The Corps has sent copies of the Level II document to the Minnesota Department of Natural Resources Southern Regional Office, the Lac qui Parle Wildlife Management Refuge and the Swift, Big Stone and Lac qui Parle Historical Societies. These actions satisfy Stipulations A and B of the Project's Memorandum of Agreement.

Also, a contract has been awarded to complete archaeological surveys and evaluative investigations at the proposed and alternative borrow areas for the Project. These studies will be completed this fall and the results and recommendations coordinated with your office. Please direct any questions or comments to Dr. Bradley Perkl, Corps archaeologist, at (651) 290-5370.

Sincerely,

Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

Enclosure

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

October 28, 2015

REPLY TO
ATTENTION OF

Regional Planning and Environment Division North

Dennis Frederickson, Regional Director
DNR Regional Office
21371 State Highway 15
New Ulm, MN 56073

SUBJECT: Minnesota Historic Property Record Level II Documentation for Marsh Lake Dam, Lac qui Parle and Swift Counties, Minnesota.

Dear Mr. Frederickson,

The St. Paul District, U.S. Army Corps of Engineers (Corps) is continuing review on an ecosystem restoration project at Marsh Lake on the Minnesota River near Appleton, Minnesota. The intent is to restore the aquatic and riparian ecosystem of Marsh Lake to a similar condition prior to the dam's construction in the 1930s. Key features include restoring the Pomme de Terre River to its historic channel, constructing a drawdown structure and fish passage within the dam structure and notching an abandoned fish pond dike.

Some of the work will result in adverse effects to the National Register of Historic Places eligible Marsh Lake Dam and its historic setting. As mitigation for adverse effects, the Corps completed a Level II historic property record documentation as stipulated in the Memorandum of Agreement between the Corps and the Minnesota State Historic Preservation Office.

Enclosed is the final Level II Minnesota Historic Property Record for the Marsh Lake Dam. Please direct any questions or comments to Dr. Bradley Perkl, Corps archaeologist, at (651) 290-5370.

Sincerely,

Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

Enclosure

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

October 28, 2015

REPLY TO
ATTENTION OF

Regional Planning and Environment Division North

Big Stone County Historical Society
985 Highway 12
Ortonville, MN 56278

SUBJECT: Minnesota Historic Property Record Level II Documentation for Marsh Lake Dam, Lac qui Parle and Swift Counties, Minnesota.

To whom it may concern:

The St. Paul District, U.S. Army Corps of Engineers (Corps) is continuing review on an ecosystem restoration project at Marsh Lake on the Minnesota River near Appleton, Minnesota. The intent is to restore the aquatic and riparian ecosystem of Marsh Lake to a similar condition prior to the dam's construction in the 1930s. Key features include restoring the Pomme de Terre River to its historic channel, constructing a drawdown structure and fish passage within the dam structure and notching an abandoned fish pond dike.

Some of the work will result in adverse effects to the National Register of Historic Places eligible Marsh Lake Dam and its historic setting. As mitigation for adverse effects, the Corps completed a Level II historic property record documentation as stipulated in the Memorandum of Agreement between the Corps and the Minnesota State Historic Preservation Office.

Enclosed is the final Level II Minnesota Historic Property Record for the Marsh Lake Dam. Please direct any questions or comments to Dr. Bradley Perkl, Corps archaeologist, at (651) 290-5370.

Sincerely,

Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

Enclosure

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

October 28, 2015

REPLY TO
ATTENTION OF

Regional Planning and Environment Division North

Swift County Historical Society
2134 Minnesota Avenue Highway 12 West
Benson, MN 56215

SUBJECT: Minnesota Historic Property Record Level II Documentation for Marsh Lake Dam, Lac qui Parle and Swift Counties, Minnesota.

To whom it may concern:

The St. Paul District, U.S. Army Corps of Engineers (Corps) is continuing review on an ecosystem restoration project at Marsh Lake on the Minnesota River near Appleton, Minnesota. The intent is to restore the aquatic and riparian ecosystem of Marsh Lake to a similar condition prior to the dam's construction in the 1930s. Key features include restoring the Pomme de Terre River to its historic channel, constructing a drawdown structure and fish passage within the dam structure and notching an abandoned fish pond dike.

Some of the work will result in adverse effects to the National Register of Historic Places eligible Marsh Lake Dam and its historic setting. As mitigation for adverse effects, the Corps completed a Level II historic property record documentation as stipulated in the Memorandum of Agreement between the Corps and the Minnesota State Historic Preservation Office.

Enclosed is the final Level II Minnesota Historic Property Record for the Marsh Lake Dam. Please direct any questions or comments to Dr. Bradley Perkl, Corps archaeologist, at (651) 290-5370.

Sincerely,

Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

Enclosure

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

October 28, 2015

REPLY TO
ATTENTION OF

Regional Planning and Environment Division North

Lac qui Parle Historical Society
250 8th Avenue
Madison, MN 56256

SUBJECT: Minnesota Historic Property Record Level II Documentation for Marsh Lake Dam, Lac qui Parle and Swift Counties, Minnesota.

To whom it may concern:

The St. Paul District, U.S. Army Corps of Engineers (Corps) is continuing review on an ecosystem restoration project at Marsh Lake on the Minnesota River near Appleton, Minnesota. The intent is to restore the aquatic and riparian ecosystem of Marsh Lake to a similar condition prior to the dam's construction in the 1930s. Key features include restoring the Pomme de Terre River to its historic channel, constructing a drawdown structure and fish passage within the dam structure and notching an abandoned fish pond dike.

Some of the work will result in adverse effects to the National Register of Historic Places eligible Marsh Lake Dam and its historic setting. As mitigation for adverse effects, the Corps completed a Level II historic property record documentation as stipulated in the Memorandum of Agreement between the Corps and the Minnesota State Historic Preservation Office.

Enclosed is the final Level II Minnesota Historic Property Record for the Marsh Lake Dam. Please direct any questions or comments to Dr. Bradley Perkl, Corps archaeologist, at (651) 290-5370.

Sincerely,

Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

Enclosure

Minnesota Historical Society

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STATE HISTORIC PRESERVATION OFFICE

November 16, 2015

Mr. Terry Birkenstock, Deputy Chief
Regional Planning and Environment Division North
St. Paul District, Corps of Engineers
180 5th Street East, Suite 700
St. Paul, MN 55101-1638

RE: Marsh Lake Ecosystem Restoration Project
Final Level II Minnesota Historic Property Record (MHPR) for the Marsh Lake Dam
Lac Qui Parle and Swift Counties
SHPO Number: 2009-0850 MOA

Dear Mr. Birkenstock:

Thank you for the opportunity to comment on the Final Level II Minnesota Historic Property Record (MHPR) documentation for the Marsh Lake Dam. This documentation has been prepared pursuant to Stipulation A of the Memorandum of Agreement (MOA) negotiated for the Marsh Lake Ecosystem Restoration Project. We understand that the Corps has also provided copies of the MHPR to the Minnesota Department of Natural Resources Southern Regional Office, the Lac qui Parle Wildlife Management Refuge and the Swift, Big Stone and Lac Qui Parle Historical Societies. We agree that these actions satisfy Stipulation A and Stipulation B of the MOA.

We understand that cultural resource surveys are underway for the proposed and alternative borrow areas for this project. We look forward to further consultation on the results of these surveys. Please contact Kelly Gragg-Johnson, Review and Compliance Specialist, at (651) 259-3455 if you have any questions regarding our comments.

Sincerely,

Sarah J. Beimers, Manager
Government Programs and Compliance

cc: Brad Perkl, USACE Archaeologist

Minnesota Historical Society

STATE HISTORIC PRESERVATION OFFICE

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March 16, 2016

Mr. Terry Birkenstock, Deputy Chief
Regional Planning and Environment Division North
St. Paul District, Corps of Engineers
180 5th Street East, Suite 700
St. Paul, MN 55101-1638

RE: Marsh Lake Ecosystem Restoration Project
Cultural Resources Survey - Proposed borrow area
Lac Qui Parle and Swift Counties
SHPO Number: 2009-0850 MOA

Dear Mr. Birkenstock:

Thank you for continuing consultation on the above project. Information received in our office on 17 February 2016 has been reviewed pursuant to the Memorandum of Agreement (MOA) negotiated for the Marsh Lake Ecosystem Restoration Project.

We have completed our review of the report entitled *Intensive Phase I Cultural Resources Survey of a Proposed Borrow Area Containing Archaeological Site 21SW27 and an Alternate Borrow Area for the Marsh Lake Ecosystem Restoration Project, Swift County, Minnesota* (February 2016), prepared by Bear Creek Archaeology. We agree with your agency's determination that archaeological site 21SW27, which is located within the proposed borrow area for the project, is **not eligible** for listing in the National Register of Historic Places (NRHP). We understand that archaeological sites 21SW65 and 21SW66, which were identified within an alternate borrow area, will be avoided. These sites have not been evaluated for the NRHP. If for any reason the alternate borrow area is proposed for this project, a Phase II evaluation of these sites will be necessary, as will further consultation with our office. The gravel road at the western boundary of the proposed borrow area, Sturm-Wilson Road (SW-APT-016), is a contributing resource to the Lac Qui Parle Flood Control Project Historic District, which has previously been determined eligible for listing in the NRHP. You have determined that impacts to this historic road will be avoided and that this project will have no adverse effect on the property. We concur with your determination.

With the submission of this report and the previously submitted Minnesota Historic Property Record for the Marsh Lake Dam, the terms of the MOA have been fulfilled. If you have any questions regarding our review of the terms of the agreement, please contact Kelly Gragg-Johnson, Review and Compliance Specialist, at (651) 259-3455.

Sincerely,

Sarah J. Beimers

Sarah J. Beimers, Manager
Government Programs and Compliance

cc: Brad Perkl, USACE Archaeologist

USACE-MVP-0000124392

USACE-MVP-0000124420

US Army Corps of Engineers
St. Paul District

Public Notice

Project: Marsh Lake Ecosystem Restoration Project

Date: April 30, 2015
Expires: June 1, 2015

In Reply Refer to:
Regional Planning and Environment Division North

1. **Project Proponent.** St. Paul District, Corps of Engineers, 180 Fifth Street East, Suite 700, St. Paul, Minnesota 55101-1678.

2. **Project Authority.** The proposed actions were authorized under the authority of the Water Resources Reform and Development Act of 2014 (PL 113-121), Section 7002(5), note 4.

3. **Project Location.** The proposed actions would be located in Big Stone, Lac qui Parle, and Swift Counties, Minnesota.

4. **Summary of the Proposed Project.**

a. The purpose of the project is to restore the aquatic and riparian ecosystem in Marsh Lake and the lower Pomme de Terre River. Major features of the proposed project are a fishway, water control structure, replacement of culverts, re-routing the Pomme de Terre River and the embankment/dam access road.

b. Permanent fill activities will involve construction of the project features. Fill materials will be composed of boulders, riprap, gravel, impervious fill, logs, and sod mats. Temporary fill activities will be associated with the construction of two coffer dams necessary for these features.

5. **Construction Schedule.** Construction of the proposed actions is scheduled to begin in summer 2016.

6. **Permits/Coordination.**

a. General. The proposed action has been coordinated with the U.S. Fish and Wildlife Service, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency (MPCA), and the Upper Minnesota River Watershed District.

b. State. The filling for the proposed project is subject to regulation by the State of Minnesota in accordance with Section 401 of the Clean Water Act. A request for Water Quality Certification will be made to the MPCA. The MPCA has indicated that this public notice serves as its public notice of the application of Section 401 water quality certification under Minnesota Rules Part 7001. The MPCA has also indicated that the Section 401 process shall begin to commence upon the issuance date of this public notice unless the MPCA notifies both the St. Paul District and the permit applicant to the contrary, in

writing, before the expiration date of this public notice. Any comments relative to the MPCA's Section 401 Certification for the activity proposed in the public notice may be sent to the following address:

Minnesota Pollution Control Agency, Resource Management and Assistance Division.
Attention 401 Certification
520 Lafayette road North
St. Paul, MN 55155-4194

c. Federal. A Draft Supplemental Environmental Assessment and Finding of No Significant Impact was prepared and coordinated in accordance with the National Environmental Policy Act. Coordination with the U.S. Fish and Wildlife Service occurred during the planning process. A Section 404(b)(1) evaluation was prepared in accordance with the Clean Water Act of 1977.

7. **Summary of Environmental Impacts.** The proposed action would result in long-term positive effects on public safety, facilities and services, aquatic habitat, biological productivity, and water quality. Construction associated with the proposed action would have minor short-term adverse effects on air quality, aquatic habitat, biological productivity, and water quality.

8. **Report.** A Draft Environmental Assessment that describes the project and the environmental impacts in detail is available to the public and can be viewed at http://www.mvp.usace.army.mil/. The report includes project drawings, a Draft Finding of No Significant Impact, and letters of coordination from regulatory agencies.

8. **Public Hearing Requests**. The Section 404(b)(1) evaluation is being distributed as part of this environmental assessment. Anyone may request a public hearing on this project. The request must be submitted in writing to the District Engineer within 15 working days of the date of this Public Notice. Interested parties are also invited to submit to this office written facts, arguments, or objections to this project before the expiration date of this Public Notice. These statements should clearly state the interest the project would affect and how the project would affect that interest. A request for public hearing may be denied if substantive reasons for holding a hearing are not provided or there is otherwise no valid interest to be served. All statements will become an official part of the project file and will be available for public examination.

9. **Review and Comment.** If you have any comments on the environmental assessment they should be provided before the expiration date of this notice. Persons submitting comments are advised that all comments received will be available for public review, to include the possibility of posting on a public website. Questions on the project or comments on the Environmental Assessment should be directed to David Potter at (651) 290-5713 or at david.f.potter@usace.army.mil. Please address all correspondence on this project to District Engineer, St. Paul District, Corps of Engineers, ATTN: Regional Planning and Environment Division North, 180 Fifth Street East, St. Paul, Minnesota 55101-1638.

Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

MEMORANDUM FOR THE RECORD

SUBJECT: Notes on Agency Coordination Meeting on the Draft Marsh Lake Ecosystem Restoration Project Supplemental Environmental Assessment

ATTENDANCE: Corps MVP - David Potter, Shahin Khazrajafari, Chris Erickson, Vanessa Hamer

MNDNR - Dave Trauba, Chris Domeier, Kent Skaar, Jeremy Losinski

UMRWD - Dianne Radermacher

USFWS – Alice Hanley

1. The subject meeting was held on 4 May 2015, from 13:00 – 14:30 hours at the Lac qui Parle Wildlife Management Area office in Watson, MN. The main objective of the meeting was to discuss the latest developments in the project, design considerations, environmental compliance, agency concerns, and potential issues for the upcoming public meeting.

2. Primary discussion points from the meeting are summarized below:
   a. Project Update
      i. *Plans and Specifications*: The Corps has completed 65% design for the project and is on schedule. Plans and specifications at 95% level is anticipated by July with a final set by September, 2015. A BCOES (Bidability, Constructability, Operability, Environmental, and Sustainability review is needed before going out to bid, and will take about one month to complete. Management expressed concern about the budget for completing Plans and Specifications.
      ii. *Funding*: Marsh Lake is one of five "New Starts" in FY16. President's budget proposes $2.7M. With the cost share, this would total about $4.15M. Total construction cost is about $12M (although a detailed cost estimate is still in progress). The plan is to obtain the remaining funds in FY17, but there are no guarantees it would be appropriated. The Corps indicated there is pressure to execute funding the same year as appropriated. Once the federal portion is obtained, the Corps would be seeking to have the Project Partnership Agreement signed. MNDNR indicated they would be meeting with management next week on budget, and will use that opportunity to highlight the need for their portion of the cost share. There is $2.2M that the MNDNR has via Lessard-Sams funds.
      iii. *Construction* – Construction is anticipated to begin in 2016 and could take 2 years. With $4.15M, construction would begin on the water control structure and the fishway.
   b. Design Considerations
      i. *Bicycle Trail* - MNDNR expressed concerns about the current plan to deconstruct part of the existing embankment road. They are still interested exploring options to leave a 2-ft high remnant road that could be used as part of a bike trail constructed at some future time with other funds (southern route). This route may cost more than the northern route, but may have higher intrinsic value. The Corps is too far along in the design process to accommodate this modification without serious disruption to their schedule. Moreover, this modification would be considered a "betterment" to the original design, and the sponsor would be solely

responsible for all design costs and additional construction and operation and maintenance costs. A cost reimbursable betterment arrangement would be needed and is being explored. There would also be a real estate agreement lease between the Corps and MNDNR. MNDNR has examined an example template (for campgrounds) and did not see any major issues. Also, the Corps would conduct a section 408 evaluation, which ensures that non-Corps actions are compatible with the Corps project. The Corps is exploring the possibility of re-examining this as part of design modifications for FY17.

c. Environmental Compliance
   i. *ESA* – The Corps is looking at including language in its specifications that would prohibit forestry clearing during periods when northern long-eared bat (threatened) are nesting/roosting. This is because of the recent listing of this species, and the close proximity of white-nose syndrome to the project area. Forestry clearing during winter may be best.
   ii. *Eagles* – One active bald eagle nest is in the project area, and could be affected by stream work in the Pomme de Terre River. However, the locations and status of nests change every year, and would need to be updated periodically (in late spring). The Corps is seeking specification language to avoid disturbance to nest. An alternative is to obtain a non-purposeful take permit from the USFWS. Questions remain on whether the USFWS would allow a permit in the project area.
   iii. *Protected Waters Permit* - Corps will obtain a Protected Waters Permit from MNDNR using its MPARs system for the project. The Corps is working with the MNDNR hydrologist on this. However, the Corps may need to have 95% design before it can complete the application.
   iv. *401 WQ Certification* - The Corps will seek 401 water quality certification from the MPCA for the project with its modifications.
   v. *SHPO* – The Corps is in the process of obtaining SHPO concurrence that the project would not impact cultural/historical significance.
d. Public Meeting
   i. The Corps has a facilitator for the public meeting, and MNDNR will take notes. The presentation outline is:
      1. Introductions
      2. Project Background (video from 2011)
      3. Project modifications proposed
      4. Previous concerns raised as part of the 2011 Feasibility Report/EA
      5. Project Schedule update

No major obstacles for the public meeting were anticipated by the group.

David Potter

Fishery Biologist

Agency Comments Received During the Public Review Period

Four comment letters or email messages were received from State and Federal Agencies:

1. June 1, 2015 letter from the U.S. Fish and Wildlife Service
2. May 27, 2015 letter from the U.S. Environmental Protection Agency
3. May 1, 2015 e-mail from Chris Domeier, Ortonville Area Fisheries Supervisor, Minnesota Department of Natural Resources
4. May 21, 2015 e-mail from Jeremy Losinski, Area Supervisor, Minnesota Department of Natural Resources - Parks and Trails

Response to Agency Comments:

Comment No.	Topic	Response
FWS-1	Federally-listed species	Concur. Section 4.3.2 in the SEA indicates which species are present in the affected counties but are not within the project area. However, northern long-eared bat may be present and would be affected by tree clearing activities. Of most concern is the work involving Embankment A, the water control structure, and Pomme de Terre River bank stabilization. However, as noted in the SEA, this work will be restricted from the period October 1 to March 28 to avoid disturbance.
FWS-2	Migratory Birds	Concur. Most of the nesting activities for colonial water-nesting bird species are limited to the existing islands in Marsh Lake. These will not be affected during construction of project features. A construction timeline will be developed as a part of work plans.
FWS-3	Service-owned lands	Concur. The SEA has been revised accordingly.
EPA-1	Mitigation	The placement of fill material into wetlands and/or the Pomme de Terre River and other Waters of the U.S. and Waters of the State is necessary to meet project objectives and is being coordinated with the Minnesota Department of Natural Resources and Minnesota Pollution Control Agency. The Corps anticipates Clean Water Act Section 401 Water Quality Certification and will include this in the final SEA. As an ecosystem restoration project, no mitigation is proposed for potential adverse impacts (ER 1105-2-100). The environmental benefits of the proposed action will be substantial and self-mitigating for the adverse effects of fill to wetlands, Waters of the U.S. and Waters of the State. Over the long-term, the net beneficial effects will exceed adverse impacts. Examples include: o The fishway rockramp for fish passage between Marsh Lake and Lac qui Parle will create about 1.4 acres of valuable riffle habitat to this section of the river. o Riffle structures in the Pomme de Terre River needed for grade control will create over 0.2 acre of riffle habitat. o Toe wood sod mats and plugs needed for bank stabilization will enhance 0.7 acre of habitat and hydraulic diversity at the bank/river interface. o Embankment A that re-routes the Pomme de Terre River into its historic channel will lengthen the river by 5,000 feet and

Comment No.	Topic	Response
		enhance fish passage between Lac qui Parle and the upper Pomme de Terre River. o Embankment B needed for re-routing the dam access road will, in combination with de-constructing the old embankment road, enhance connectivity of the lower Pomme de Terre River with about 60 additional acres of floodplain forest habitat. Over the long-term, wetlands associated with the river would be enhanced.
EPA-2	Wetlands	Concur. Some of these recommendations to minimize impacts to wetlands will be incorporated into our specifications. Others will be considered as part of our review of the contractor's environmental protection plan. However, the contractor is given some discretion on how the work is to be implemented.
EPA-3	Endangered / Threatened Species – mussels	Relocating mussels from the lower Pomme de Terre River has been discussed with the Minnesota DNR as part of a joint effort. However, the decision to implement this action will be contingent upon available funding, available manpower, and work priorities. If implemented, this work would be done immediately prior to the construction of Embankment A, which is tentatively planned for 2017.
EPA-4	Endangered / Threatened Species – NLE bat	Concur. Work restrictions for the dates of tree clearing will be included as part of our plans and specifications unless there are changes to the USFWS's 4(d) rule on northern long-eared bat.
EPA-5	Climate Change	This project is not intended as a flood protection; the majority of flood control is maintained at the Lac qui Parle dam, downstream of this project. This project will enhance resiliency of the area to handle flashier future hydraulic conditions. In the case of the Louisburg Road culverts, excessive flows will be re-directed through a bridge opening to the west.
EPA-6	Climate Change	Concur. A summary discussion of climate change has been added to the SEA. This project will enhance the aquatic vegetation to Marsh Lake and to the PdT River floodplain, which will increase resiliency under future flashier hydraulic conditions that have been forecasted under climate change.
EPA-7	Climate Change	Concur. Based on the amount of material to be moved and consumption rates of diesel fuel, we have estimated emissions to be less than the 25,000 metric tons; thus a qualitative assessment is provided.
EPA-8	Climate Change	Alternatives for the proposed project modifications are to build the project as it was proposed in the 2011 Feasibility Report/EA or to eliminate some of the features. Individual features have a role in meeting the project objectives and would be eliminated if funding were limited. The project modifications are intended to save costs or increase project performance. In the case of the latter, improvements

Comment No.	Topic	Response
		to performance would result in a healthier ecosystem that would be more resilient to climate change impacts. Furthermore, healthier forests and aquatic habitats would act as carbon sinks over the long-term. In that regard, we see the short-term impacts of global house emissions associated with construction to be more than offset over the long-term. Furthermore, imposing special conditions as part of a contract would likely drive the cost up and reduce competition from contractors.
EPA-9	Climate Change	The proposed project modifications are not intended as flood control measures. It is the opinion of our H&H staff that the culverts and the bridge at the Louisburg Road will be able to handle high precipitation events in the upper Marsh Lake system.
EPA-10	Wildlife	We will explore a culvert design that are embedded or that retains natural substrate to enhance fish passage. However, the Louisburg Road culverts would be connecting lakes with very little gradient; most available designs are for streams with higher gradients, including the publication by the River and Stream Continuity Partnership. Any modifications to the culverts would likely not be comparable to other culverts designed for fish passage.
EPA-11	Monitoring	The latest draft of the Performance Monitoring and Adaptive Management Plan (AMP) regurgitates some of the information from the 2011 Feasibility Report/EA and is about 60 pages long. It is also a living document that will change as we get closer to construction. We believe a summary is sufficient for purposes of the SEA; however, a draft of the plan will be made available to EPA and others upon request.
EPA-12	Other	Concur. All correspondence from agencies related to the draft SEA will be included as an appendix in the Final SEA. Our response to those correspondences is provided herein.
DNR-1	Fish Pond	The Corps is looking into plugging the pipe; however budget constraints may limit removing the other structures associated with the fish pond.
DNR-2	Non-motorized trail	We are proceeding with plans and specifications with the modified features as identified in the SEA with the focus on ecosystem restoration benefits. However, we anticipate the project to occur in two phases in response to available funding. Phase I will focus on the structures at the dam (i.e., water control structure, rockramp fishway, and west parking lot) with construction to begin in 2016. Phase II would focus on the remaining project features (including the de-constructing of a portion of the embankment road) and construction would not occur until 2017 or later. The timing of this may allow for this feature to be further modified in accommodating a non-motorized trail as a betterment.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 American Blvd E.
Bloomington, Minnesota 55425-1665

Comment No.

June 1, 2015

Mr. Terry Birkenstock, Chief
Environmental and GIS Branch
St. Paul District Corps of Engineers
180 5th Street East, Suite 700
St. Paul, Minnesota 55101-1678

Re: Draft Supplemental Environmental Assessment for the Marsh Lake Ecosystem Restoration Project: Big Stone, Lac qui Parle, and Swift Counties, Minnesota
FWS TAILS #2015-CPA-0023

Dear Mr. Birkenstock:

This responds to your May 1, 2015, request for comments for the proposed modifications of the Draft Supplemental Environmental Assessment (Draft Supplemental EA) of the Marsh Lake Ecosystem Restoration Project: Minnesota River - Big Stone, Lac qui Parle, and Swift Counties, Minnesota. The proposed modifications were designed to reduce overall cost and/or increase the value of project actions to restore the aquatic and riparian ecosystem in the Marsh Lake project area. The following comments are being provided pursuant to the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act, and the Fish and Wildlife Coordination Act (FWCA).

Federally-listed Species

Section 4.3.2 (Endangered and Threatened Species) identifies the Dakota skipper (*Hesperia dacotae*, threatened), the Poweshiek skipperling (*Oarisma poweshiek*, endangered) and the northern long-eared bat (*Myotis septentrionalis*, threatened) as present within Big Stone, Lac qui Parle, and Swift Counties, Minnesota, but not within the action area of the proposed project. Dakota and Poweshiek skippers prefer native prairie habitats and it is not anticipated that the proposed project will directly or indirectly affect any native prairie areas. Presence of the northern long-eared bat, however, cannot be ruled out within the action area unless suitable habitat is not present or being impacted, or a valid survey effort has documented species absence.

FWS-1

Page 12 of the materials you provided indicates that the water control structure modifications may affect approximately 1.5 acres of the existing embankment and floodplain forest or scrub/shrub land cover class. We acknowledge that only a small portion of this is likely to be identified as suitable roosting habitat and anticipate less than an acre of suitable forest cover to be impacted.

Section 5.3.8 (Federally-listed Species) of the Draft Supplemental EA identifies that tree removal activities would be restricted to periods outside of the nesting or roosting season to avoid impacts to the northern long-eared bat. If removal of suitable habitat occurs outside of the summer roosting

season for this species, we would anticipate no adverse impacts. We recommend including the dates of April 1 to September 30, as the summer roosting period for the northern long-eared bat. If suitable roosting habitat is anticipated to be removed during this time period, our office should be contacted for Section 7 consultation under the ESA.

Migratory Birds

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior.

FWS-2

Records indicate the past and/or current use of Marsh Lake by several colonial water-nesting bird species: American pelican, great blue heron, great egret, double crested cormorant, Forester's tern, black crowned night heron, and ring billed gulls. Development of a construction timeline to minimize impacts to these areas during prime nesting times should be considered. The Service recommends that proposed construction and excavation within potential bird nesting habitat be completed outside of the primary nesting period (April 1 to August 31) when possible and feasible. Attempts to minimize impacts to potential migratory bird nesting habitats should be made at all times during construction and excavation.

Service-owned Lands

FWS-3

The Hastad, Hegland, and Plover Waterfowl Production Areas (WPAs) are within the proposed project area. Several private land tracts held under Conservation and Wetland Easement by the Service are also within the project area. Proposed project activities are not anticipated to have a negative impact on Service-owned or easement lands.

The proposed project should provide benefits in the way of wetland habitat improvement, aquatic vegetation establishment, increased fish passage, and increased species diversity. These comments are pursuant to laws within the jurisdiction of the Service and our comments may act as our FWCA report requested by your agency. Thank you for the opportunity to provide comments on this proposed project. Please contact Fish and Wildlife Biologist Andrew Horton at 612-725-3548 (extension 2208) if we may be of further assistance.

Sincerely,

for, Peter Fasbender
Field Supervisor

cc (via email):
Alice Hanley, Project Leader - Big Stone NWR/WMD
Liz Pelloso, ES Environmental Protection Agency
David Potter, USACE-St. Paul District (St. Paul)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 27 2015

REPLY TO THE ATTENTION OF
E-19J

Terry Birkenstock
U.S. Army Corps of Engineers – St. Paul District
180 Fifth Street East
Suite 700
St. Paul, Minnesota 55101

RE: Draft Supplemental Environmental Assessment for the Marsh Lake Ecosystem Restoration Project: Big Stone, Lac qui Parle, and Swift Counties, Minnesota

Dear Mr. Birkenstock:

On May 1, 2015, the U.S. Environmental Protection Agency received U.S. Army Corps of Engineers (USACE) correspondence, undated, requesting EPA's review of and comments on a Draft Supplemental Environmental Assessment (Draft Supplemental EA). This Draft Supplemental EA supplements the document entitled: *Feasibility Report and Environmental Assessment, Marsh Lake Ecosystem Restoration Project, Minnesota River – Big Stone, Lac qui Parle, and Swift Counties, Minnesota* issued in November 2011 (Feasibility Report/EA). The Feasibility Report/EA disclosed the potential environmental impacts for the proposed Marsh Lake Ecosystem Restoration Project that sought to return the Marsh Lake area ecosystem to a less degraded and more natural and functional condition. A Finding of No Significant Impact (FONSI) was signed on January 6, 2012.

EPA has reviewed the Draft Supplemental EA for the aforementioned project. This letter provides our comments on the Draft Supplemental EA, pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

In October 2014, the USACE examined ways to reduce the overall cost and/or increase the value of recommended plan/preferred alternative. Recent coordination with resource agencies has also resulted in modifications to project design. The purpose and scope of the Supplemental Draft EA are limited to evaluating the potential environmental effects of the proposed modifications that were not covered in the Feasibility Report/EA.

USACE's recommended plan (2011) initially proposed five separate restoration measures. These initial restoration measures, and proposed modifications, are as follows:

1. **Restoration of the Pomme de Terre River into its historic natural channel.** During construction of the Marsh Lake Dam, the Pomme de Terre River was rerouted in a channelized fashion between 1936 and 1939 to outlet into Marsh Lake. In order to reconnect the river to its natural channel, two earthen cut-off dikes (embankments) were proposed to be constructed to force the river flow back to the natural channel, allowing approximately 11,500' of historic channel will receive restored flow. A 450' long vehicular bridge over the restored river channel was previously proposed to be constructed to maintain access to the Marsh Lake Dam.

   Proposed 2015 modifications: A portion of the dam access road/embankment would be re-routed compared to the plan in the Feasibility Report/EA (which would have followed 100th Street SW and required construction of a new bridge). The re-routed alignment would go to the north/northeast and follow 255th Avenue SW south over Embankment B, then southeast across an agriculture field owned by the Minnesota Department of Natural Resources (MnDNR), then across the existing Pomme de Terre River diversion channel over Embankment A, and tie into the existing dam embankment and roadway. This proposed reroute removes future bridge maintenance costs as a bridge is no longer necessary.

   A slight modification from the 2011 design regarding the proposed rerouting the lower Pomme de Terre River into its historic channel is also proposed.[1] This modification also proposes the installation of two rock riffle grade control structures to be located upstream of the abandoned embankment road, between 2 and 2.5 miles upstream of the confluence with Lac qui Parle. This modification would also use natural bank stabilization techniques instead of riprap in certain areas of channel work. The initial project design in the Feasibility Report/EA did not include bank stabilization features along the Pomme de Terre River or embankment areas. However, it is now recognized that bank stabilization features may be necessary as part of restoring the Pomme de Terre River to its historic channel in order to control where flow enters Lac qui Parle and to protect existing infrastructure (i.e., the Marsh Lake Dam embankment). Approximately 2,000 linear feet of the riverbank would be protected with this technique. Additionally, up to seven plugs would also be constructed at key points of the river where high flows threaten to breach the bank into a remnant channel.

[1] Page 119 of the 2011 Feasibility Report/EA stated that in restoring the river to its historic channel that, *"...no excavation will be required to reestablish the historic channel."* However, Figure 20 and text in the Supplemental Draft EA mention excavation and plugging required to create the modifications to the historic channel as proposed.

2. **Breaching of the dike at the abandoned fish pond located south and downstream of the Marsh Lake Dam.** Dike breaching will allow connectivity between the pond and Lac qui Parle/Minnesota River, will allow fish access to the pond area, and will provide shorebird habitat during low water levels.

   Proposed 2015 modifications: This abandoned fish pond is no longer proposed to be breached. MnDNR has recently indicated their lack of support for this measure, as the area would likely become inhabited by carp, thus affecting water quality in the pond.

3. **Construction of water control structures (stop log structures) at the existing Marsh Lake Dam to allow drawdowns.** Construction of a water control structure at Marsh Lake Dam will allow for active water level management within the lake. Water level management has been proposed for spring/summer conditions as needed to allow for controlled drawdowns to encourage emergent aquatic plants to germinate and establish. Winter drawdowns are also proposed to reduce water levels and dissolved oxygen within the lake to impose hypoxia stress and winter kill on invasive carp, which currently dominate the lake.

   Proposed 2015 modifications: This proposed modification would move the location of the water control/drawdown structure from the existing emergency spillway to an area just southwest of the spillway. The water control structure would be independent of the existing emergency spillway, which would remain unaltered. In addition, the new drawdown structure would use sluice gates instead of stop logs to control flow, which would have less maintenance costs. More importantly, this would minimize dangerous hydraulic roller conditions that are common with straight-drop structures. This modification would enhance public safety and reduce operations and maintenance costs. Additionally, this proposed modification would ensure that features would not interfere with the future construction of a state bicycle trail by MnDNR's Parks and Trails Department at the dam. A 112-ft long walkway would also be constructed over the water control structure and would also act as a pedestrian bridge. An additional pedestrian/bike bridge would be needed over the fishway (see #5 below) and the existing emergency overflow spillway to allow for future pedestrian/bike traffic from one side of the river to the other as part of the proposed Minnesota River State Trail. The Draft Supplemental EA proposes installing footings for these two future crossings.

4. **Installation of gated culverts at three existing culvert locations along Louisburg Grade Road**. A total of seven existing deteriorating 60" diameter culvert pipes at three locations are proposed to be replaced with concrete box culverts with stop log water control structures. New culverts with stop log structures are proposed to allow management of water levels upstream of the culverts in the upper part of Marsh Lake. Higher water levels can be managed in upper Marsh Lake to allow for spawning of desirable northern pike and improve survivability of young fish in early spring. Removal or lowering of the stop log structures later in the season would allow access between upper Marsh Lake and Marsh Lake to promote a native fishery within Marsh Lake.

Proposed 2015 modifications: *Culverts are proposed to only be replaced at two areas, not the three areas originally proposed. New culverts are proposed to be gated box culverts, not stop-log structures as originally proposed. At the west site, three existing arch pipes measuring 54 inches x 84 inches x 50 feet would be replaced with a set of three pre-cast concrete barrel box culverts, each measuring 72 inches x 72 inches x 90 feet. One of the culverts would be separated with 2 feet of impervious fill from the two side-by-side culverts. At the east site, two existing arch pipes with similar dimensions as the west site would be replaced with a set of two side-by-side pre-cast concrete barrel box culverts, each measuring 72 inches x 72 inches x 90 feet. A small duck boat landing at the west site would also be improved by placement of an 8-inch layer of gravel. These modification would lower project costs.*

5. **Construction of a fishway at the existing Marsh Lake Dam**. The rock ramp/riffle fishway as proposed will allow year-round fish passage between Marsh Lake, Lac Qui Parle, and the Pomme de Terre River.

   Proposed 2015 modifications: *The rock ramp fishway is proposed to be constructed at a 4% slope instead of the 3% slope originally proposed. This increases the length of the fishway by approximately 60' as well as the overall footprint of the fishway.*

Other proposed 2015 project modifications include:

- Utilizing, as a borrow site, material from the existing dam embankment to be removed (associated with Feature #1).
- Maintaining the existing recreation features at the Marsh Lake Dam Day Use Facility instead of making improvements.
- Allowing seasonal public access from the west side of the dam and installing a turnaround parking lot.

EPA's comments on the Draft Supplemental EA relate to mitigation, wetland impacts, endangered and threatened species and wildlife impacts, climate change, and monitoring, and are as follows:

MITIGATION

- The placement of fill material into wetlands and/or the Pomme de Terre River and other Waters of the U.S. and Waters of the State will require coordination and permitting from several of Minnesota's state regulatory agencies. The need for a Section 401 Water Quality Certification was mentioned in the Draft Supplemental EA. However, there was no discussion on whether or not the proposed placement of fill into wetlands (such as for embankments, parking areas, culvert replacements) will require wetland and/or stream mitigation. EPA assumes that, at a minimum, some wetland mitigation will be required for proposed wetland impacts.

EPA-1

Recommendation: The Final Supplemental EA should discuss which proposed activities will require wetland and/or stream mitigation. A discussion of required mitigation,

including ratios, type of mitigation (permittee-responsible or mitigation bank), and location should be included.

WETLANDS

- Thoughtful project design and consideration of staging areas and access will likely allow for smaller permanent wetland impacts or fewer temporary wetland impacts.

EPA-2

Recommendations: To further minimize impacts to wetlands and sensitive aquatic habitats, EPA reiterates our prior recommendations that the following measures be implemented during construction:

- Winter construction, if/when feasible;
- Minimized widths of temporary access roads/paths;
- Use of removable materials for construction of temporary access roads/paths (e.g. timber/swamp mats) in lieu of "fill" materials such as stone, riprap, or wood chips;
- Use of timber/swamp mats to distribute the weight of construction equipment in order to minimize soil rutting and compaction;
- Use of vehicles and construction equipment with wide tires or rubberized tracks, or low ground-pressure equipment, to further minimize wetland impacts during construction;
- Use of long-reach excavators, where appropriate, to avoid driving, traversing, or staging in wetland or floodplain areas; and
- Use of cofferdams and dam/pump arounds to isolate work areas from active flow.

ENDANGERED/THREATENED SPECIES

- Section 4.3.2 (Endangered or Threatened Species) fails to mention the presence of state-listed mussel species, or the impacts that project modifications will have on them. This is in contrast to the Section 404(b)(1) evaluation, which states, "*Construction of the new embankment to re-route the Pomme de Terre River would bury macroinvertebrates including native mussels and fingernail clams in the Pomme de Terre River where the new embankment crosses the channel. This would affect a 0.30-acre area of river bed. In addition, mussels in the lower reach of the channelized Pomme de Terre River below the new embankment would no longer be in a flowing river and would probably die*" and "*Re-routing the Pomme de Terre River would result in temporary adverse impacts on state-listed mussel species...*"

EPA-3

Recommendation: EPA hereby reiterates comments from our June 16, 2011, and October 31, 2011, correspondence in which we noted that the lower channelized portion of the Pomme de Terre River supports a diverse mussel community, including several state-listed mussel species (including the elktoe and black sandshell). EPA supports the Monitoring and Adaptive Management plan (2011) to be implemented by the Minnesota DNR (MnDNR) to monitor and evaluate the response of native mussels in the restored portion of the Pomme de Terre River. EPA encourages USACE and MnDNR to harvest mussels from the portion of channel to be abandoned and to relocate them into the

restored portion of river channel. This commitment should be included in the forthcoming modified FONSI.

- While no impacts to Federally-listed species are anticipated with the proposed project modifications, Section 5.3.8 (Federally-listed Species) states, "*For northern long-eared bat, tree removal activities would be restricted to periods outside of nesting or roosting to avoid impacts.*"

EPA-4

Recommendation: The Final Supplemental EA should note specific work-restriction dates for tree clearing to avoid impacts to the northern long-eared bat. These work-restriction dates should be committed to in the forthcoming modified FONSI.

CLIMATE CHANGE

- The Draft Supplemental EA did not include any discussion of climate change or potential impacts of climate change on the study area, including increased temperatures, higher intensity precipitation events, and increased runoff. There was no discussion on adaptation and how the proposed project's measures will combat flashier hydraulic conditions and increased runoff from higher precipitation events. In December 2014, CEQ issued revised draft guidance[2] with recommendations of how to consider the effects of greenhouse gas (GHG) emissions and climate change in NEPA documentation.

Recommendations: EPA recommends the following be completed and information added to the Final Supplemental EA:

EPA-5

- Discussion regarding climate change adaptation and how the proposed project's modification, including culvert sizing and embankment/flood protection will combat flashier future hydraulic conditions.

EPA-6

- Include a summary discussion of climate change and reasonably foreseeable climate change impacts relevant to the project, based on U.S. Global Change Research Program[3] assessments, to assist with identification of potential project impacts that may be exacerbated by climate change and to inform consideration of measures to adapt to climate change impacts. This will assist in identifying resilience-related changes to project and proposed modifications that should be evaluated and considered.

EPA-7

- Estimate the GHG emissions associated with the preferred alternative/modifications and project alternatives. Example tools for estimating and quantifying GHG emissions can be found on CEQ's NEPA.gov website[4]. For actions which are likely to have less than 25,000 metric tons of CO2-e emissions/year, providing a qualitative estimate is acceptable, unless quantification is easily accomplished. The estimated GHG emissions can serve as a reasonable proxy for climate change impacts when comparing the proposal and alternatives. In disclosing the potential impacts of the proposal and reasonable alternatives, consideration should be given to whether and to

[2] http://go.usa.gov/3KEyR
[3] http://www.globalchange.gov/
[4] https://ceq.doe.gov/current_developments/GHG_accounting_methods_7Jan2015.html

what extent the impacts may be exacerbated by expected climate change in the project area, as discussed in the "affected environment" sections.

- Describe measures to reduce GHG emissions associated with the proposed project/modifications, including reasonable alternatives or other practicable mitigation opportunities, and disclose the estimated GHG reductions associated with such measures. Any commitments to implement reasonable mitigation measures that will reduce or eliminate project-related GHG emissions should be committed to in the FONSI.

EPA-8

- Include a discussion on adaptation and how the proposed project's flood control measures and culvert sizing will combat flashier hydraulic conditions and increased runoff from higher precipitation events. The Final Supplemental EA analyses should, as appropriate, consider practicable changes to the proposed modifications to make them more resilient to anticipated climate change.

EPA-9

WILDLIFE

- New gated culverts along Louisburg Road are proposed to manage water levels in upper Marsh Lake to promote a healthy, native fishery within Marsh Lake.

Recommendations: EPA recommends that culverts be designed to allow fish and other aquatic organism passage and to ensure continuity of the aquatic habitat (by not restricting or altering water depth, flow, or velocity). EPA reiterates comments made in our comment letter dated October 31, 2011; if four-sided box culverts must be used, they should be embedded into the lake bottom in a manner that will not impede fish passage. EPA recommends that USACE review design considerations developed by the River and Stream Continuity Partnership[5].

EPA-10

MONITORING

- Appendix F states, "*An update to the 2011 monitoring plan (Appendix R of the Feasibility Report/EA) is currently under development as a part of the project's plans and specifications phase. The Corps of Engineers and Minnesota Department of Natural Resources are collaborating on the plan, referred to as the Performance Monitoring and Adaptive Management Plan (AMP).*" This was not included as part of the Draft Supplemental EA.

Recommendation: The modified AMP should be included with the Final Supplemental EA.

EPA-11

[5] http://www.streamcontinuity.org/pdf_files/MA%20Crossing%20Stds%203-1-11%20corrected%203-8-12.pdf

OTHER

- The Draft Supplemental EA stated in Section 6.3 that a revised letter from the U.S. Fish and Wildlife Service pursuant to required coordination under the Fish and Wildlife Coordination Act is anticipated.

EPA-12

Recommendation: All correspondence from agencies received relating to the Draft Supplemental EA, including correspondence from the USFWS, the State Historic Preservation Office, MnDNR, EPA, etc., should be included as an appendix to the Final Supplemental EA. USACE's responses to all agency comments received should also be included in the Final Supplemental EA.

Thank you for the opportunity to review and comment upon the Draft Supplemental EA. We are available to discuss our comments with you in further detail if requested. **Please send us the Final Supplemental EA and the signed Finding of No Significant Impact (FONSI) when they are available.** If you have any questions about this letter, please contact Ms. Liz Pelloso, PWS, of my staff at 312-886-7425 or via email at pelloso.elizabeth@epa.gov.

Sincerely,

Kathleen Kowal

for Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

cc (via email):
Phil Delphey, US Fish and Wildlife Service-Twin Cities Field Office
Evan Ingebrigtson, USACE-St. Paul District (Brainerd)
Benjamin Orne, USACE-St. Paul District (St. Paul)
Kevin Molloy, Minnesota Pollution Control Agency
Jim Brist, Minnesota Pollution Control Agency
Karen Kromar, Minnesota Pollution Control Agency
Tom Hovey, MnDNR
Ryan Bjerke, MnDNR
Ethan Jenzen, MnDNR
Erik Carlson, MnDNR

From: Domeier, Chris R (DNR)
To: Khazrajafari, Shahin MVP
Cc: Potter, David F MVP; Trauba, David R (DNR)
Subject: [EXTERNAL] Marsh Lake Fish Pond Inlet
Date: Friday, May 01, 2015 9:42:26 AM

DNR-1

Considering the location of the proposed parking area on the west side, can removal of the fish pond inlet house, plugging the pipe, and removing the outlet from the pond be considered as part of the project? Although we will not breach the pond, we do need to fill, remove or fence-off the outlet structure which is going to pose a public safety threat being located by the parking area. In addition the house needs to go and the inlet from Marsh Lake and outlet through the dike need plugging. Pics attached.

Chris Domeier

Ortonville Area Fisheries Supervisor

811 Pine Street

Ortonville, MN 56278

320-839-2656

From: Losinski, Jeremy (DNR)
To: Potter, David F MVP
Cc: Soupir, Gregg M (DNR); Skaar, Kent (DNR)
Subject: [EXTERNAL] RE: draft meeting notes from the Marsh Lake agency coordination meeting
Date: Thursday, May 21, 2015 2:18:20 PM

David,

DNR-2

Thank you for compiling these meeting notes and sending out for comment. The Division of Parks and Trails it still very interested in pursuing a non-motorized trail on the embankment road as noted and is meeting with the UMRWD to explore a partnership as outlined by the Corps necessary for the trail construction as a betterment.

Thank you,

Jeremy Losinski

Area Supervisor, MN DNR -Parks & Trails
164 Co. Rd. 8 NE, P.O. Box 457
Spicer, MN 56288

P: 320-796-2161 ext. 229
F: 320-796-6282

Public and NGO Comments Received During the Public Review Period

One comment letter and one email message were received from members of the public and Non-Government Organizations:

1. May 6, 2015 email from Just Ducks.
2. May 29, 2015 letter from Ducks Unlimited

Response to Public and NGO Comments:

Comment No.	Topic	Response
JD-1	Bike trail	The Corps is focused on the ecosystem benefits of this project and recognizes the value of enhancing connectivity of the Pomme de Terre River to its floodplain. The DNR Parks and Trails Division has indicated interest in pursuing a bicycle trail as a project betterment using non-federal money. We anticipate project construction to occur in two phases, which would provide additional time for DNR to strengthen their case for this betterment. The Corps is proceeding with plans and specifications on the project as described in the SEA. If a trail is option is pursued, a design that minimizes the effects on river connectivity would be preferred, e.g., a maximum elevation that allows for frequent overtopping during high flow events.
DU-1	Carp	The current design for the water control structure uses gates that open from the bottom instead of stoplogs so as to eliminate hazardous rollers. Velocities would be too high for any potential screens. Furthermore, a rockramp fishway will be constructed that promotes fish passage from Lac qui Parle to Marsh Lake. Carp, as well as native fishes, would be able to use the fishway. However, the water control structure would allow for drawdowns intended to kill carp and promote rooted aquatic vegetation. The presence of common carp in the system and the looming threat of other Asian carp (bighead, silver, black, and grass) are strong considerations for fish passage on this project as well as other areas of Minnesota. Fishery biologists believe that the current configuration of Marsh Lake dam would not stop upstream movements of these fish, especially during high flow events. Although there is the risk that the proposed rockramp fishway would be used by carp, it is designed to enhance connectivity for native fish species and sizes in support of their life history requirements. Such a feature would help native fish sustain and compete with exotic fishes. If funding allows, the Louisburg Road culverts will be a part of the project. These are box culverts with stoplog structures, however, no screens are proposed for these structures.

May 4, 2015 **MARSH LAKE ECOSYSTEM RESTORATION – SIGN IN SHEET**

NAME	INTEREST IN THE PROJECT (OPTIONAL)
Tim Rittenour	R&R Outdoors (Owner)
Jim & Vaughn Rittenour	Appleton - Land owner PdT River
John Gaedke	Ortonville / Naturalist
Daren Lehne	[illegible]
Phil Mitchell	Waterfowler / Hunter
TOM WATSON	PADDLER / NATURALIST
Peter Bohlig	Fisherman / Hunter
Will Mitchell	Ducks unlimited
Dawn Hegland	Trail
JON Schneider	Ducks Unlimited
HARLAN Wiese	Hunter, trapper, Fisherman

May 4, 2015 **MARSH LAKE ECOSYSTEM RESTORATION – SIGN IN SHEET**

NAME	INTEREST IN THE PROJECT (OPTIONAL)
Gary Hendrickx	swift cty commission bike trail

high water marks 2 access road

weirs mg envisioned - taken out b/c of cost - what was this cost
why a cost constraint

river rerouted - will new channel
would it characteristically change river

fishery folk think about fish movt?

expectations of water full?

From: Peter Bohlig [mailto:pbohlig@millerhartwig.com]
Sent: Wednesday, May 06, 2015 10:40 AM
To: Trauba, David R (DNR)
Subject: input meeting

Dave,

It was great meeting you on Monday. I am really excited to see this project come to reality and marsh returned to the great place it once was before we screwed it up.

Win Mitchell has brought you up a million times about what you are doing up at the refuge and the hard work you guys put in. Thank you!

JD-1

The only opinion I didn't put down was to forget about the bike trail. We will have more benefit from the expanded floodplain and there would have to be a bridge over it that would negate some of the cost savings of having the new entrance route. Plus the people that want it have never been down there. I don't think they realize that you have to ride a mile or so down a gravel road to get to it. Then ride a mile on a paved path to where? Dumb idea.

Have a great day!!

WBR,

Just Ducks

Pete

Peter Bohlig

Miller-Hartwig Insurance Agency

O-952-469-0426

F-952-469-1881

C-612-207-0822

DUCKS UNLIMITED

Jon P. Schneider
Manager – Minnesota Conservation Programs
311 East Lake Geneva Road, Alexandria, Minnesota 56308 • (320) 762-9916 • Fax (320) 759-1567 • jschneider@ducks.org

May 29, 2015

Terry J. Birkenstock, Deputy Chief - Regional Planning and Environmental Division North
St. Paul District, U.S. Army Corps of Engineers
180 Fifth Street East, Suite 700, St. Paul, Minnesota 55101-1678

Subject: Draft Supplemental Environmental Assessment - Marsh Lake Ecosystem Restoration Project

Dear Mr. Birkenstock,

On behalf of 42,000 Ducks Unlimited members and supporters in Minnesota, I am writing to convey our support for, and concurrence with, the Draft Supplemental Environmental Assessment (SEA) and Finding of No Significant Impact (FONSI) for proposed modifications of the Marsh Lake Ecosystem Restoration Project (Project) near Appleton, Minnesota. This project will significantly enhance Marsh Lake's aquatic ecology, and will improve both water quality and wildlife habitat for waterfowl and human recreation alike.

As a 5,000-acre shallow lake reservoir with an average depth of about three feet, Marsh Lake (along with Heron, Swan, and Christina) is one of four historically very important shallow lakes in Minnesota that provided abundant aquatic plants and invertebrates required by diving ducks and other wetland-dependent wildlife. Marsh Lake has a history of heavy waterfowl use in the past, due to abundant aquatic food resources. However, waterfowl habitat and water quality in Marsh Lake deteriorated over the years due to high and stable water levels, increased inflows of water and nutrients, lack of frequent fish winterkill, and overabundance of invasive common carp. Restoring water-level variation in Marsh Lake is critically needed.

Ducks Unlimited supports the proposed Marsh Lake project because it includes seasonal water level variation that mimics the natural hydrograph of the lake. However, we remain concerned about the future effects of carp on the ecology of Marsh Lake due to the emphasis of the project on fish passage – which may unfortunately likely include bighead, silver, grass, black, and common carp from the Mississippi River.

Aggressive seasonal water level variation in Marsh Lake using the new variable crest outlet structure, especially lower winter water levels that promote fish winterkill events, will help limit carp abundance in the lake. Restoration of the Pomme de Terre River channel to enter the Minnesota River downstream of the Marsh Lake embankment and outlet is also a positive improvement. However, the annual influx of carp into Marsh Lake remains a major concern - especially for the shallow northwestern end of Marsh Lake west of the Louisburg Grade road. We recommend the new Marsh Lake outlet structure and Louisburg Grade road culverts be designed and equipped with stop-log bays capable of accepting fish barrier screens or grates in the future if carp become problematic. Ducks Unlimited Canada has successfully employed this technique at Delta Marsh in Manitoba (see: www.ducks.ca/your-province/manitoba/programs-projects/delta-marsh/).

DU-1

Sincerely,

Jon P. Schneider, Manager – Minnesota Conservation Programs, Ducks Unlimited, Inc.

Leader in Wetlands Conservation

Copies: Tom Landwehr, Commissioner – Minnesota Department of Natural Resources (DNR)
Paul Telander, Wildlife Chief - Minnesota Department of Natural Resources (DNR)
David Trauba, Lac qui Parle Area Wildlife & Acting Regional Manager – Minnesota DNR
Ricky Lien, Wetland Habitat Team Supervisor – Minnesota DNR
Nicole Hansel-Welch, Shallow Lakes Program Supervisor – Minnesota DNR
Shahin Khazrajafari, Project Manager, St. Paul District, U.S. Army Corps of Engineers
Dianne Radermacher, Administrator - Upper Minnesota River Watershed District
Brian Ross, Minnesota State Chairman – Ducks Unlimited
Win Mitchell, Minnesota Past State Chairman – Ducks Unlimited
Peter Eigen, Minnesota Public Policy Chairman – Ducks Unlimited
Gildo Tori, Director of Public Policy – Ducks Unlimited Great Lakes Region
Josh Kavanagh, Regional Biologist - Ducks Unlimited

US Army Corps of Engineers
St. Paul District

Public Notice

Project: Marsh Lake Ecosystem Restoration Project

Date: February 25, 2016
Expires: March 28, 2016

In Reply Refer to:
Regional Planning and Environment Division North

1. **Project Proponent.** St. Paul District (District), Corps of Engineers, 180 Fifth Street East, Suite 700, St. Paul, Minnesota 55101-1678.

2. **Project Authority.** The proposed actions were authorized under the authority of the Water Resources Reform and Development Act of 2014 (PL 113-121), Section 7002(5), note 4.

3. **Project Location.** The proposed actions would be located in Lac qui Parle and Swift Counties, Minnesota (Figure 1 in Appendix A of the revised 404(b)(1) evaluation).

4. **Summary of the Proposed Project.**

The purpose of the project is to restore the aquatic and riparian ecosystem in Marsh Lake and the lower Pomme de Terre River. Major features of the proposed project are a fishway, water control structure, replacement of culverts, re-routing the Pomme de Terre River and the embankment/dam access road. Permanent fill activities will involve construction of the project features. Fill materials will be composed of concrete, boulders, riprap, gravel, impervious fill, logs, and sod mats. Temporary fill activities will be associated with the construction of coffer dams.

On April 30, 2015, the District issued a public notice soliciting comments for the draft Supplemental Environmental Assessment (SEA) and associated Section 404(b)(1) evaluation for fill activities resulting from the proposed project. The comment period ended on June 1, 2015 and the comments received were largely favorable to the proposed project. After the expiration of the review period, changes and additional detail were proposed for the construction methods for the project. This led to a proposal for the inclusion of up to seven additional temporary coffer dams. Therefore, the District has revised the Section 404(b)(1) evaluation to include these coffer dams and is distributing the evaluation for comment via this public notice.

5. **Construction Schedule.** Construction of the proposed actions is scheduled to begin in winter of 2017.

6. **Permits/Coordination.**

a. General. The proposed action has been coordinated during the planning process with the U.S. Fish and Wildlife Service, Environmental Protection Agency, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency (MPCA), and the Upper Minnesota River Watershed District.

b. State. The filling for the proposed project is subject to regulation by the State of Minnesota in accordance with Section 401 of the Clean Water Act. It is anticipated that the MPCA will issue a Water Quality Certification. The MPCA has indicated that this public notice serves as its public notice of the application of Section 401 water quality certification under Minnesota Rules Part 7001. The MPCA has also indicated that the Section 401 process shall begin to commence upon the issuance date of this public notice unless the MPCA notifies both the St. Paul District and the permit applicant to the contrary, in writing, before the expiration date of this public notice. Any comments relative to the MPCA's Section 401 Certification for the activity proposed in the public notice may be sent to the following address:

Minnesota Pollution Control Agency, Resource Management and Assistance Division.
Attention 401 Certification
520 Lafayette road North
St. Paul, MN 55155-4194

c. Federal. The draft SEA and FONSI was prepared and coordinated in accordance with the National Environmental Policy Act, Endangered Species Act, Fish and Wildlife Coordination Act, and other Federal authorities. The draft SEA was made available for public review April 30, 2015 – June 1, 2015. This revised Section 404(b)(1) evaluation was prepared in accordance with the Clean Water Act of 1977.

7. **Summary of Environmental Impacts.** The proposed action would result in long-term positive effects on public safety, facilities and services, aquatic habitat, biological productivity, and water quality. Construction associated with the proposed action would have minor short-term adverse effects on air quality, aquatic habitat, biological productivity, and water quality. The temporary coffer dams would have an adverse effect on aquatic habitat, but they would be removed after construction and any adverse effects would be short-term.

8. **Report.** Following the expiration of this public notice, substantive comments regarding the 404(b)(1) evaluation will be addressed and incorporated. Then, substantive comments previously received for the SEA will be addressed there prior to signing a FONSI and finalizing the 404(b)(1) evaluation.

9. **Public Hearing Requests.** The revised Section 404(b)(1) evaluation is being distributed as part of this Public Notice. Anyone may request a public hearing on this project. The request must be submitted in writing to the District Engineer within 15 working days of the date of this Public Notice. Interested parties are also invited to submit to this office written facts, arguments, or objections to this project before the expiration date of this Public Notice. These statements should clearly state the interest the project would affect and how the project would affect that interest. A request for public hearing may be denied if substantive reasons for holding a hearing are not provided or there is otherwise no valid interest to be served. All statements will become an official part of the project file and will be available for public examination.

10. **Review and Comment.** The revised Section 404(b)(1) evaluation is available at http://www.mvp.usace.army.mil/Home/PublicNotices.aspx. If you have any comments on the Section 404(b)(1) evaluation, they should be provided before the expiration date of this notice. Persons submitting comments are advised that all comments received will be available for public review, to include the possibility of posting on a public website. Questions or comments on the project should be directed to David Potter at (651) 290-5713 or at david.f.potter@usace.army.mil. Please address all

correspondence on this project to District Engineer, St. Paul District, Corps of Engineers, ATTN: Regional Planning and Environment Division North, 180 Fifth Street East, St. Paul, Minnesota 55101-1638.

for Terry J. Birkenstock
Deputy Chief, Regional Planning and
Environment Division North

Comments Received on the Revised 404(b)(1) Analysis:

Name: Joe Makepeace

Affiliation: Concerned citizen

Type of Contact: Telephone call

Date: 2 March 2016

Comment

Mr. Makepeace called me. He expressed concerns that we will be spending a lot of money and wanted to know of the anticipated outcome. He has seen loss of waterfowl use. He is also concerned about the quality of fishing getting worse with the project. There is really good fishing at the dam. They catch many walleye at the Marsh Lake Dam. He is concerned about what will happen to game fish. He also asked about how water levels would be managed.

I asked if Mr. Makepeace had any specific comments with regards to the 404(b)(1) analysis. He reiterated his concerns about the quality of fishing becoming worse with the project. He also would like to see public access maintained during construction, which was something the local newspapers eluded to.

Potter, David F MVP

To: Geo651@aol.com
Cc: Khazrajafari, Shahin MVP; Howell, Dwight D CPT MVP
Subject: Comment on Marsh Lake project

Mr. Bock:

Thank you for your comments and questions. Below is our response to the questions you pose:

1: Project objectives relate to promoting aquatic vegetation like sage pondweed that would increase water clarity and provide a food source for waterfowl. There are no objectives pertaining to deepening the lake, therefore dredging was not considered.

2. The current plan is to implement operations adaptively (we refer to this as "Adaptive Management"). This means that lake level management initially will be based on ideas and science brought in elsewhere. For example, we have done similar drawdowns in three pools of the upper Mississippi River and have seen a good response when we do 2 consecutive years of drawdown. In this case, the response (i.e., aquatic vegetation) lasts about 6 to 8 years thereafter. For Marsh Lake, a similar approach may be taken initially, but this operations plan is likely to change based on lessons learned. It may be the case that only 1 year of drawdown every 10 years is needed to maintain the conditions that managers like. At this time, we do not have plans to do a drawdown every 4 years. The timing and frequency of drawdowns over the long term will be based on monitoring data and management targets.

The water control structure is proposed for managing and attaining ecosystem benefits, not managing for floods or drought downstream.

3. Maintenance of the rockramp fishway will be the responsibility of the project sponsor. However, the Corps has designed this to be stable under the anticipated hydrologic conditions. We expect there may be minor movement of boulders and gravel, but nothing requiring major fixing. The Minnesota DNR has built many of these type of projects and has shown little to no maintenance is required. See http://www.dnr.state.mn.us/eco/streamhab/reconnecting_rivers.html.

4. The project geographic scope is limited to Marsh Lake and the lower Pomme de Terre River.

5. The Corps completed a feasibility report and has shown the project will provide substantial ecosystem benefits. It has been intensely coordinated with resource agencies and other stakeholders. There appears strong support from the public as well. Project features have been carefully designed. We believe the project has a high likelihood of success, and will be actively monitoring it post construction.

6. As mentioned before, the operational plan will be based on adaptive management principles.

David Potter, Fishery Biologist
US Army Corps of Engineers, St. Paul District
180 5th Street East
St. Paul, MN 55101
Tel: 651.290.5713

From: Geo651@aol.com [mailto:Geo651@aol.com]
Sent: Thursday, March 03, 2016 8:40 AM
To: Potter, David F MVP <David.F.Potter@usace.army.mil>
Subject: [EXTERNAL] Marsh Lake Dam Project=Marsh Lake plan.

David I Am Concerned About The Marsh Lake Plan For Several Reasons For Several Reasons.
It Will Kill Off A Great Walleye Population That Will Never Recover If This Project Goes Forward. They Will Never Have A Chance To Recover In 4 Years With The Plan That Is In Place To Be Drawn Down Every 4 Years. Then There Is The Pelican Nesting That Is Known World Wide They Will Not Stand a Chance The Jung Will Die With Out Adequate Water And we Will Louse The Flock Not A Good Thing. Then There Is The Rock Run Or Fish Way That Is Supposed To Be Put In. I Am Sure You Know About Hydraulics. And Movable Barriers Like Rocks. Case In Point The Rock Dam On The Pine River In Cross Lake And Crow Wing County.The Association Has Spent Thousands Of Dollars Year After Year To Maintain This Dam That Is Constantly Under Repair From Ice And High Water. Check It Out. We Need To Conserve The Water That we Have And Use It Wisely.My Other Concern Is The Impact On The Nesting Ducks In The Area I Am A Avid Duck Hunter And Have Hunted Marsh Lake Since 1965 I Have Sean Many Changes In The Lake Some Good Some Bad But The Duck Hunting Has Always Ben Good Except For 1976 And 1986 When The Lake Was dry Or Very low Don't Fix Something That Is not Broke

Now My Questions.

1 Wouldn't It be Better To Deepen The Lake By Dredging
2 Isn't It Wiser To Keep And Maintain Water For When It Is Needed Down River
3 Who Will Be Responsible For Maintaining The Rock Runs And Will They Have Funds To Repair It Every Time It Washes Out
4 Why Not Clean And Deepen The Sediment Ponds Up River By Quarry Area They Have Never Ben Maintained.
5 Does The Core Of Engineers Really Back This Plan That Has Ben Presented And Why.
6 Shouldn't There Be More Research Into The Long Term Effects. And The People That It Will Be Most Effected By This Plan.

Thanks George Bock

Appendix E:

Revised Clean Water Act Section 404(b)(1) Evaluation

Marsh Lake Ecosystem Restoration Project

Minnesota River

Lac qui Parle, and Swift Counties, Minnesota

April 2016

REVISED CLEAN WATER ACT SECTION 404(b)(1) EVALUATION

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I. PROJECT DESCRIPTION

A. Location

The proposed fill activity would take place in Marsh Lake on the Minnesota River, the Marsh Lake Dam tailwater, a small fishpond downstream of the embankment, and in the Lower Pomme de Terre (PdT) River located in western Minnesota (Appendix A - Figure 1). Lac qui Parle and Marsh Lake Reservoirs form boundaries for Lac qui Parle, Chippewa, Swift, and Big Stone Counties.

B. Authority and Purpose

The Marsh Lake feasibility study was authorized by a Resolution of the Committee on Public Works of the U.S. House of Representatives, May 10, 1962. The resolution reads as follows:

> "Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the report of the Chief of Engineers on the Minnesota River, Minnesota, published as House Document 230, 74th Congress, First Session and other pertinent reports, with a view to determining the advisability of further improvements in the Minnesota River Basin for navigation, flood control, recreation, low flow augmentation, and other related water and land resources."

The purpose of this document is to comply with Section 404(b)(1) of the Clean Water Act pertaining to guidelines for placement of dredged or fill material into the waters of the United States. This evaluation also provides information and data to the Minnesota Pollution Control Agency (MPCA) demonstrating compliance with State water quality standards for the decision-making process about State Clean Water Act Section 401 water quality certification.

C. General Description

A general description of the proposed project is provided in the integrated 2011 Feasibility Report / Environmental Assessment and proposed modifications of specific features are described in Section 3.1 and Appendix A of the 2016 Supplemental Environmental Assessment (SEA). A summary of the proposed modifications follows.

The proposed fill activities would consist of modifications to the Marsh Lake Dam to enable passive and active water level management and provide for fish passage between Lac qui Parle Lake and Marsh Lake and the PdT River (Appendix A - Figure 2 and Figure 3). This would include construction of a rockramp fishway (Appendix A - Figure 9 through Figure 11) and a water control structure in the embankment adjacent to the emergency spillway (Appendix A - Figure 4 through Figure 6). The drawdown structure would be a concrete structure with a series of sluice gates. An earthen temporary coffer dam would be needed for constructing the water control structure in Marsh Lake (Appendix A - Figure 8). Also, temporary coffer dams would likely be needed on the upstream and downstream sides of the fishway (Appendix A - Figure 9 through Figure 11).

The dam access road would also be re-located along 255th Ave SW and through an agriculture field and across the PdT River (Appendix A - Figure 16). This would lengthen the road by about 1 mile. Fill activities would be necessary to restore the lower PdT River to its former channel near its confluence with the Minnesota River. A cutoff dike (Embankment A) would cross the PdT River (Appendix A - Figure 17) which, when combined with removal of the old embankment and addition of channel plugs, would re-direct PdT River flows into its historic channel. Fill would also be necessary along the new road (Embankment B) that would eliminate a hydrologic connection between Marsh Lake and a small 13-acre backwater and remnant floodplain (Appendix A - Figure 18). Temporary coffer dams would likely be needed to construct both embankments (Appendix A - Figure 19 and Figure 20). The old access road would be removed to allow greater connectivity between the PdT River and its floodplain.

The PdT River channel would be re-routed, requiring measures to stabilize and redirect flow in the form of riffle structures and bank stabilization (Appendix A - Figure 22 through Figure 27).

A parking lot would be constructed on the west side of the dam for public access (Appendix A - Figure 14). The lot would encroach slightly on an adjacent fish pond. Nearby, a maintenance ramp would be constructed on the upstream side of the dam for access to Marsh Lake by work crews (Appendix A - Figure 7).

Additional recreational features would include an east-side parking lot (Appendix A - Figure 21) and provisions for a bicycle trail that may be constructed in the future by the Minnesota Department of Natural Resources (MNDNR) Parks and Trails Division (Appendix A - Figure 12 and Figure 13).

D. Description of Dredged and Fill Material

(1) General Characteristics of Material

Random / back fill- A combination of rock, sand, soil, and impervious fill.

Concrete – Structural concrete would be composed of a cementitious material (portland cement), water, fine, and coarse aggregates (1-1/2 inches), and admixtures.

Boulder - Boulders would range from 2 to 7 feet in diameter.

Rip-rap – Rip-rap would include R20, R80, and R270 gradation rock, as well as large boulders. Individual rocks would have a median diameter of 18 (R20) to 36 (R270) inches.

Gravel - Gravel material that would be used as bedding underneath some of the structures. Gravel would also be used on rockramp and riffle structures.

Impervious fill – Impervious fill would be soil with a high clay content, having a plasticity index of less than 50.

Topsoil /sod mats – Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth. Sod mats would be topsoil encapsulated in coir material or a layer of soil, roots, and vegetation representative of the area.

Coarse wood – Coarse wood used for the toe wood sod mats would be composed of large trees, each with a minimum 20 foot length and between 18 and 24 inches diameter. Large trees would have root wads still attached.

Fine wood – Fine wood used for the toe wood sod mats would be composed of branches, shrubs, and willow transplants.

Sheetpile – Molded metal panels designed to interlock to form a retaining wall.

Note: All rock material proposed would be clean and reasonably free from soil and fines and contain no refuse. All rock material will be obtained from an approved existing rock quarry. Rock would not be obtained by mining native prairie areas.

(2) Quantity of Material

Estimates for the total quantities of materials used for permanent fill of project features are: 21,045 cy of random fill, 1,580 cy of concrete, 1,627 cy of boulder, 12,313 cy of rip-rap, 2,811 cy

Table 1. Area and estimated quantities of fill material used for project features.

	Total Footprint (acres)	Fill Footprint (acres)	Cover Type Affected	Random /Backfill	Concrete	Boulder	Riprap	Gravel	Impervious fill	Topsoil/sod mats (sq ft)	Coarse wood (logs)	Fine wood (willow stakes)	TOTAL FILL (cy)
EXISTING EMBANKMENT													
Riprap 59+20	0.49	0.16	River				417.0	101.0					**518.0**
Road removal	5.10	0.00	Floodplain forest										
FISHWAY													
Rock-ramp structure	1.64	1.64	Tailwater			1626.8	6959.1	2101.0	2485.9				**13172.8**
Footings/Contain. Emb	0.38	0.00	Feature		72.0				4064.6				**0.0**
Temp coffer dam u.s.[a]	0.06	0.06	Lake						197.4				**197.4**
Temp coffer dam d.s. [a]	0.30	0.30	Tailwater						1487.5				**1487.5**
EMERGENCY SPILLWAY													
Footings	0.01	0.00	Feature	60.0	8.1			33.0					**0.0**
DRAWDOWN STRUCTURE	0.29	0.01	Concrete										
Water Control Structure	0.84	0.19	Embankment	3000.0	1500.0		637.2	188.0	826.0				**0.0**
Maintenance ramp	0.06	0.06	Lake				100.0	40.0	61.0				**201.0**
Temporary coffer dam u.s. [a]	1.85	1.85	Lake						23158.4				**23158.4**
Drawdown channel	2.19	0.00	Grasslands/shrub				1177.6	348.2					**0.0**
Footbridge	0.00	0.00											
PARKING													
West side parking lot	0.92	0.08	Feature, Grasslands, Pond	615.0									**615.0**
East side parking lot	2.00	0.00	Grasslands										**0.0**
NEW EMBANKMENT													
Embankment A	2.16	0.40	River, F forest	9000.0			1200.0						**10200.0**
Coffer Dam A2 [a]	0.08	0.08	River						390.0				**390.0**
Coffer Dam A1 [a]	0.03	0.03	River						1025.0				**1025.0**
Embankment B	1.81	1.00	Lake, F Forest	6000.0			600.0						**6600.0**
Coffer Dam B2 [a]	0.11	0.11	Lake						1320.0				**1320.0**
Coffer Dam B1 [a]	0.11	0.11	Lake						1187.0				**1187.0**
Embankment	23.13	0.00	Existing feature										

	Total Footprint (acres)	Fill Footprint (acres)	Cover Type Affected	Random /Backfill	Concrete	Boulder	Riprap	Gravel	Impervious fill	Topsoil/sod mats (sq ft)	Coarse wood (logs)	Fine wood (willow stakes)	TOTAL FILL (cy)
POMME DE TERRE RIVER													
Riffle 118+00	0.12	0.06	River & F forest				611.0						**611.0**
Riffle 126+00	0.12	0.06	River & F forest				611.0						**611.0**
Toe Wood Sod Mats (TWSM):													
TWSM 34+00	0.08	0.00	Floodplain forest	367.0						3300.0	23	367	**0.0**
TWSM 36+55	0.02	0.00	Floodplain forest	75.0						675.0	5	75	**0.0**
TWSM 60+00	0.12	0.00	Floodplain forest	583.0						5250.0	37	583	**0.0**
TWSM 73+00	0.03	0.00	Floodplain forest	167.0						1500.0	11	167	**0.0**
TWSM 82+60	0.02	0.00	Floodplain forest	108.0						975.0	7	108	**0.0**
TWSM 95+50	0.02	0.00	Floodplain forest	108.0						975.0	7	108	**0.0**
TWSM 97+00	0.02	0.00	Floodplain forest	108.0						975.0	7	108	**0.0**
TWSM 119+70	0.04	0.00	Floodplain forest										
PLUG 36+20	0.02	0.02	Wetlands	50.0						2025.0	5	225	**50.0**
PLUG 71+90	0.05	0.05	Wetlands	122.0						4950.0	12	550	**122.0**
PLUG 74+20	0.05	0.05	Wetlands	122.0						4950.0	12	550	**122.0**
PLUG 77+75	0.03	0.03	Wetlands	83.0						3375.0	8	375	**83.0**
PLUG 81+70	0.04	0.04	Wetlands	100.0						4050.0	10	450	**100.0**
PLUG 96+15	0.04	0.04	Wetlands	94.0						3825.0	8	425	**94.0**
PLUG 97+65	0.04	0.04	Wetlands	94.0						3825.0	8	425	**94.0**
PLUG 111+50	0.08	0.08	Wetlands	189.0						7650.0	18	850	**189.0**
Channel Excavation:													
Excavate 1+00 to 9+00	1.07		Wetlands										**0.0**
Excavate 9+00 to 17+00	0.72		Wetlands										**0.0**
Excavate 59+20 to 63+50	0.52		Wetlands										**0.0**
Excavate 70+50 to 71+60	0.17		Wetlands										**0.0**
Excavate 72+00 to 74+75	0.36		River										**0.0**
Excavate 78+25 to 82+40	0.62		Floodplain forest										**0.0**
Excavate 93+50 to 99+00	0.71		Floodplain forest										**0.0**
Borrow site	7.28	0.00											0.0
Total- coffer dams only				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**28765.3**				**28765.3**
TOTAL w coffer dams	**55.97**	**6.56**		**21045.0**	**1580.1**	**1626.8**	**12312.9**	**2811.2**	**36202.8**				**75578.8**
TOTAL w/o coffer dams	**53.43**	**4.02**		**21045.0**	**1580.1**	**1626.8**	**12312.9**	**2811.2**	**7437.5**				**46813.5**
Total (sq ft)										**48300.0**			
Total – logs											**178.0**		
Total - willow stakes												5366.0	

Note: Quantities for in-water placement in cubic yards for materials below elevation 939.6 ft on Marsh Lake side and 933.6 ft in the tailrace unless otherwise specified.

[a] Coffer dams are temporary structures needed for construction.

of gravel, and 7,438 cy of impervious fill (Table 1). There would also be 48,300 square feet of topsoil/soil mats, 178 trees (coarse wood), and 5,366 willow stakes. Temporary coffer dams would require up to 28,765 cy of impervious material. However, all coffer dams, with the exception of that for the water control structure, may be constructed with less material, depending on the contractor's final design. Moreover, contractor may elect to use different materials, such as sheetpile.

(3) Sources of Material

Suitable material excavated from a designated borrow site would be used for fill that includes a 9.9-acre borrow site in an agricultural field on the Lac qui Parle Wildlife Management area near the north end of the Marsh Lake Dam (Appendix A - Figure 15). Material could also be used from the abandoned dam access road. However, additional rock may be needed, and would be obtained from a local or regional commercial source. Excess materials excavated or dredged would be transported to a designated upland placement site that could include the designated borrow site.

E. Description of Proposed Fill Placement Sites

(1 - 3) Location, Size, and Type of Site

Approximately 6.7 acres of fill (temporary and permanent) is anticipated with project features as described below.

Fishway (1.6 acres permanent fill) - The fishway would be constructed from the current spillway and extend about 300 feet downstream at a 3% slope (Appendix A - Figure 10). This construction activity would affect about 1.6 acres of the Minnesota River tailwater. Boulder weirs would be spaced 20 feet apart with each achieving individual 10-inch drops. The ramp would range in width from 150 feet at the dam, to 200 feet wide at the downstream edge. It would be approximately 300 feet long. The downstream invert would tie into the river bed at elevation 926.0 ft. The ramp would tie into the existing bank on the east side. On the west side, the ramp would tie into a partially rip-rapped earthen embankment or containment embankment, 20 feet wide and with 1H:4V side slopes. Over 1,600 cubic yards of large (1.6 ft diameter and larger boulders for weirs) rock would be used in the fishway channel (Appendix A - Figure 9). Rip-rap and gravel bedding would be used to armor the fishway channel. Impervious fill would also be used as bedding and fill material.

Temporary coffer dams on both sides of the fishway would be constructed, the design and composition of which left up to the discretion of the contractor. Assuming an earthen design, the largest footprint

of the upstream and downstream coffer dams would be about 0.06 and 0.3 acre, respectively (Appendix A - Figure 3).

Water Control Structure and Access Ramp (< 0.3 acre permanent fill) - The water control structure would be constructed west of the emergency spillway through the existing embankment (Appendix A - Figure 3). To construct the water control structure, a two-stage earthen temporary coffer dam, estimated to be about 1.9 acres in size, would be built on the Marsh Lake side of the structure (i.e., the water intake). This would be removed after the permanent structure has been completed. It is likely the material from this coffer dam would be used for the fishway coffer dams.

Associated with the water control structure, a 100-ft long dredge maintenance access ramp would extend from the top of the west embankment into Marsh Lake; however, only 60 feet of this (< 0.1 acre) would be in the lake (Appendix A - Figure 28). Rock would be placed in a 33-inch thick layer on top of 12 inches of bedding material. The top 8 inches of the rip-rap would be chinked. The ramp would have a 15% slope and would extend from the top of the embankment (950.0 ft) into the Marsh Lake bottom (935.0 ft).

Westside Parking Lot - (< 0.1 acre permanent fill) – A small portion of the west side parking lot would require fill at the northeast corner of an abandoned fish pond that has limited habitat value. Fill would consist of random earthen material.

Embankment / Dam Access Road (1.4 acres permanent fill) - One mile of the new embankment/dam access road would be constructed to an approximate elevation of 954.7 ft. Rock rip-rap against wave action would be necessary for the lake side of the new embankments. Rock rip-rap would be placed to a top elevation equal to rock rip-rap on the existing embankment (942.0 feet). Impervious clay fill material for the new embankments would be borrowed from a nearby upland site and/or from the abandoned embankment road.

Embankment A of the new dam access road would displace about 1.8 acres of floodplain forest and 0.4 acre of the PdT River would have permanent fill (Appendix A - Figure 17). The embankment would have a roadway on top, but would also act as a diversion plug for re-directing the PdT River into its historic channel upstream of Marsh Lake Dam. The embankment is about 800 ft long and will be sloped on either side at 1H:4V. Temporary coffer dams on either side of the feature would likely be needed as part of constructing this feature (Appendix A - Figure 20). Assuming the contractor uses earthen materials for this, about 0.1 acre of the PdT River would be temporarily displaced.

Embankment B would be built on top of an existing road, but would require removal of 24-inch diameter concrete culverts. The embankment will be about 400 feet long and will be sloped on either side at 1H:4V. The embankment would fill approximately 1 acre of Marsh Lake or the backwater. Temporary coffer dams would be installed on both sides of this feature to allow for

construction of the embankment (Appendix A - Figure 19). Assuming the contractor uses earthen materials, these would displace about 0.2 acre of the PdT River.

PdT River (0.5 acre permanent fill) - Two in-channel erosion control structures would be necessary to prevent head-cutting in the PdT River channel above the embankment. Riffle structures would be constructed to control grade, thus preventing the river from headcutting (Appendix A - Figure 26). Riffles would be tied into each bank and would traverse the entire river channel. Riffle materials would be boulders, rip-rap, and gravels and result in fill of about 0.1 acre. Riffles would be sloped on the upstream side at 1H:4V and on the downstream side of the crest at 1H:20V. This would provide a drop in the water surface elevation of about 7/10 of a foot (8 inches).

A small amount of riprap would be used on the embankment to protect it against the re-routed PdT River. It is expected this would be limited to an area < 0.2 acre at or below the water surface.

Bank stabilization would be constructed along about 1,000 linear feet of the PdT River. Toe wood sod mats would be used (Appendix A - Figure 27). For this, about 20 feet of excavation into the bank along PdT River would be needed to anchor the materials. Large trees (coarse woods) would be placed in an interlocking matrix and anchored with boulders. Topsoil or soil mats would be placed to fill the void between trees. Branches, shrubs, and live willow cuttings (fine wood) would be integrated into the matrix. Seven plugs would be used to keep the river from flowing down remnant channels during high flow events. Plugs would also be used and would be based on the toe-wood sod mat design. Total fill associated with this activity is anticipated to be less than 0.4 acre.

(4) Type of Habitat

The PdT River floodplain has scattered green ash, black willow and cottonwood trees with reed canary grass in the lower areas. The PdT River channel is sandy with patches of gravel.

The existing aquatic habitat near the Marsh Lake Dam was altered by construction and operation of the dam. The lake bed material is sandy with scattered boulders and rip-rap along the lake side of the dam.

Aquatic habitat affected by Embankment B is considered open water with low habitat quality and which is fishless.

The existing aquatic habitat at the abandoned fish pond is open water with the bed composed of sand and silt, considered marginal aquatic habitat for fish or wildlife.

(5) Timing and Duration

Subject to approval and funding, construction could begin in the fall of 2016. Construction for this project would take 2 to 3 years, depending on when construction is initiated. Construction would likely be in two phases. The first phase would focus on the water control structure, fishway, and

the west parking lot. Phase 2 would involve construction of the new embankment road and re-routing the PDT River. Activities involving tree removal would occur during winter. Activities involving in-water construction would be done when water levels allow. Additional time would be required for establishment of vegetation.

F. Description of Fill Placement Method

The material would be moved and placed mechanically.

The stripping and removal of rip-rap, soil, and vegetation would be required prior to fill placement for a number of project features. The fill would likely be trucked to the location, dumped near existing high ground, and then progressively graded into the feature.

Construction actions would include the use of Best Management Practices (BMPs) to minimize short-term impacts. The specific construction methods, including identification of specific BMPs, have not yet been identified. Potential BMPs include construction during low-flow periods, use of silt curtains, dewatering of the construction area using cofferdams, minimizing the time period for exposed soils, and control of stormwater flow from any upland areas disturbed during construction. Work involving tree clearing or re-routing the PdT River is anticipated to be completed in winter to avoid impacts to T&E species and minimize ground disturbance.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

(1) Substrate Elevation and Slope

The average annual water level on Marsh Lake is 938.3 feet. The bed of Marsh Lake in the vicinity of the proposed modifications to Marsh Lake Dam is fairly flat and approximately 935.2 feet. The sill elevation of the water control structure would be set at 934.6 feet to enable drawdown of most of the lake. An approach channel would require dredging. Some scour of the lake bed would be expected near the dam when the sluice gates pass flow.

As the historic PdT River channel was originally formed by the geomorphic conditions of the river and its watershed, it is expected that the channel plan form dimensions would result in a stable natural channel once the fine sediments that have accumulated in the former channel are washed out. The reconnection of the PdT to its historic channel would require some excavation of material that now blocks this flow path, particularly through the existing embankment and near the mouth where it would meet the Minnesota River. It would also require that fill be placed in a channelized reach of the current flow path (Embankment A). Some grade control structures would also be necessary to prevent

head cutting as well as bank protection. However, the general philosophy would be to connect the river to its original flow path and allow natural processes to form the channel.

Cross section surveys of the PdT River below Appleton, MN indicate that the average bank full width of channel is approximately 90-110 feet. This width was verified with aerial photos. Steady flow modeling of the PdT River with a bankfull discharge (850 cfs) shows that hydraulic depth varies from 3-5 feet in the reach between Appleton and the mouth. An average depth of 4 feet is therefore considered the typical depth for the river at bank full flow in the project reach. Based on the stream slope upstream of the project area, a typical slope of 0.05% is considered representative of the reach to be restored.

(2) Sediment Type

Sediment in Marsh Lake is sandy silt. Sediment in the PdT River is sandy gravel. Sediment in the former channel of the PdT River is approximately six inches of silt and organic matter overlying the former sand and gravel of the river bed.

(3) Dredged/Fill Material Movement

The material proposed for excavation would be removed mechanically and could be re-used as fill or loaded onto trucks and hauled to the borrow site or a designated disposal site. For most project activities, gravel bedding would be placed first, followed by various larger sized rock. In the case of natural techniques (e.g., toe-wood sod mats), coarse wood would be placed on the bottom, followed by soil/encapsulated soil and fine wood. No significant movement from the project site would be expected.

B. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water

(a) Salinity – Water in the project area has naturally high total dissolved solids, influenced by calcium sulfate in the soils. The fill activities would not affect salinity.

(b) Chemistry - The use of clean fill material and mechanical placement would preclude any significant impacts on water chemistry.

(c) Clarity - Minor, short-term reductions in water clarity are expected from sediment resuspension associated with the proposed fill activities. Long term, the project is expected to increase water clarity in Marsh Lake.

(d) Color - The proposed fill activities should have no impact on water color.

(e) Odor – Dense summer blue green algae blooms and windrows of scenescent algae on Marsh Lake produce foul odors and toxicity. The project should reduce foul odors in the summer caused by algae blooms.

(f) Taste – Marsh Lake and the Pomme de Terre River are not used for water supply.

(g) Dissolved Gas Levels – Modification of the Marsh Lake Dam would allow winter drawdown, intentionally inducing hypoxia (low dissolved oxygen concentration) to kill carp. The addition of the rock-ramp fishway and riffle structures would result in higher DO levels in the Minnesota and PdT rivers. However, the use of wood for bank stabilization may cause a small dip in DO levels associated with biological oxygen demand.

(h) Nutrients - The proposed fill activities should have no impact on nutrient loading (nitrogen and phosphorus) to the system; however, concentrations in the water may be affected by the form of vegetative uptake.

(i) Eutrophication - The proposed modifications to Marsh Lake Dam and rerouting the Pomme de Terre River would reduce nutrient loading to Marsh Lake, encourage the growth of aquatic vegetation and reduce the density and duration of blue-green algae blooms.

(j) Temperature - The proposed fill activities would have no impact on water temperature.

(2) Current Patterns and Water Circulation

(a) *Current Patterns and Flow* – Constructing the water control structure in a new area of the dam embankment would affect the flow pattern immediately upstream and downstream of the dam. Flow would be redirected through the structure and enter the tailwater on the west side instead of flowing over the current spillway. Re-routing the PdT River to its former channel would change the pattern of PdT River flow. The areas downstream of Embankments A and B would no longer receive flows from the PdT River or Marsh Lake. The river was channelized to enter Marsh Lake above the Marsh Lake Dam when the project was first constructed.

The changes to large flood levels on Marsh Lake from the proposed project were evaluated with two methods (see Appendix H Hydraulics and Hydrology in the 2011 Feasibility Report/EA):

1) For water level simulations over 20 years (1983 – 2003), results for the two largest flood events (1997 & 2001) with & without project features were compared and,

2) Estimated 100 year flood hydrographs for with and without project conditions were routed through the reservoir.

Simulated with project water levels were on the order of 1.5 foot lower than modeled existing conditions for the 1997 & 2001 flood events. This is primarily attributed to reduced inflows to Marsh Lake due to the altered PdT River flow path.

Marsh Lake is expected to experience lower peak flood elevations due to the project as designed in this feasibility study. Note that the current 100-year Pool Elevation on Marsh Lake of 947.4 feet is above the maximum pool elevation and is not relied upon for flood control downstream.

(b) *Velocity* – Modifying the Marsh Lake Dam fixed crest spillway with a fishway would provide a variety of current velocities that would enable upstream fish passage and eliminate the public safety hazard of the hydraulic backroller below the existing spillway.

Restoring the PdT River to its former channel would restore a more natural pattern of current velocity in the river.

(c) Stratification – Because Marsh Lake is shallow and thoroughly wind-mixed, the lake does not stratify.

(d) Hydrologic Regime - The proposed fill activities would have no impact on the hydrologic regime of inflows to the project area with the exception of a 13-acre backwater to Marsh Lake (Appendix A - Figure 29), which would have no surface water inflow.

(3) Water Level Fluctuations

The combined project features would alter the water level regime in Marsh Lake. The overall effect would be increased water level variability, minimal changes during flood events, and occasional managed water level drawdowns. Re-routing the PdT River to its former channel would change the pattern of PdT River flow. The river was channelized to enter Marsh Lake above the Marsh Lake Dam when the project was first constructed.

(4) Salinity Gradient

The project area is not in a coastal estuary; there would be no effect on salinity gradient.

C. Suspended Particulate/Turbidity Determination

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Placement Sites

Some temporary and localized increases in suspended sediment would result from construction of the project features.

Restoring the PdT River to its former channel would reduce sediment loading to Marsh Lake by about half and improve conditions for growth of submersed aquatic plants. PdT River flow at higher levels of river discharge would spread over its banks into the vegetated floodplain before reaching the Minnesota River, removing sediment and nutrients before flowing into Lac qui Parle. Modification of Marsh Lake Dam and restoring a more natural stage hydrograph would allow emergent and submersed aquatic vegetation to expand in Marsh Lake. The vegetation would reduce sediment resuspension and trap suspended sediment resulting in increased water clarity. Winter drawdowns would limit the abundance of common carp that resuspend bottom sediment.

Actions Taken to Minimize Impact - Standard construction procedures and BMPs in compliance with Federal and State requirements would be used. The material would be placed mechanically. Silt barriers may be deployed during construction to limit mobilization and transport of sediment in the PdT River. Mussels in the PdT River have been quantitatively surveyed and recolonization of mussels in the restored channel would be monitored (see Section 4.1.4 in the 2011 Feasibility Report/EA).

(2) Effects on Chemical and Physical Properties of the Water Column

(a) *Light Penetration* – Light penetration in adjacent waters would be reduced temporarily during construction but would quickly return to background levels. Over the long-term, light penetration is anticipated to increase with improved water clarity.

(b) *Dissolved Oxygen* – Flows through the water control structure are not expected to appreciably affect DO levels. The rockramp fishway and two riffle structures on the PdT River would increase DO levels downstream through aeration as water passes through the riffle structures.

(c) *Toxic Metals and Organics* – The proposed fill activities are not expected to release any toxic metals or organics.

(d) *Pathogens* – The proposed fill activities are not expected to release pathogens to the water column.

(e) *Aesthetics* – The proposed fill activities are will improve aesthetics by creating added diversity in the form of riffle habitat. Aesthetics of the lower PdT River would be greatly enhanced by re-creating a sinuous channel with banks stabilized with natural materials. However, during construction, aesthetic appeal of the area would be diminished.

(3) Effects on Biota

Effects on Fish and Plankton - Construction of the project features would result in temporary and localized increases in suspended solids that are not expected to adversely affect plankton or fish. Silt curtains likely will be used where practicable to limit sediment resuspension during construction.

Over the long-term, the project is expected to increase water clarity in Marsh Lake, resulting in increased extent and abundance of submersed aquatic plants. Increased water clarity and aquatic plants would improve habitat conditions for native fish, zooplankton and macroinvertebrates.

Modifying the Marsh Lake Dam with a sluice-gate water control structure would allow drawdowns that would reduce the abundance of common carp and favor native fish species.

Restoring the PdT River to its former channel would provide fish from Lac qui Parle access to the river for spawning. Construction of a fishway in Marsh Lake Dam would allow northern pike and other fish species access to high quality spawning habitat in upper Marsh Lake.

Fish and other aquatic taxa that are stranded in dewatered areas (e.g., behind cofferdams) would likely die.

Effects on Benthos - Construction of the new embankment to re-route the PdT River would bury macroinvertebrates including native mussels and fingernail clams in the PdT River (see Section 4.1.4 in the Feasibility Report/EA) where the new embankment crosses the channel. In addition, mussels and other benthic organism in the lower reach of the channelized PdT River below the new embankment would no longer be in a flowing river and would probably die. The riffle structures and rockramp fishway would also kill non-mobile benthic organisms in the PdT River and Minnesota River.

Benthos, primarily chironomid and ceratopogonid midge larvae living in the silt substrate in the former Pomme de Terre River would washed away when the river is diverted back into its former channel. The former channel area would scour down to the historic sand/gravel substrate and would rapidly recolonize with benthic macroinvertebrates from upstream. Native mussels are expected to recolonize the restored river channel.

Effects on Wildlife - The proposed project is expected to increase water clarity in Marsh Lake, resulting in increased extent and abundance of submersed aquatic plants. Increased water clarity and aquatic plants would improve habitat conditions for native fish, muskrats, mink, fish-eating birds like pelicans, herons and egrets, and breeding waterfowl. One of the primary benefits of the project would be increased food (sago pondweed tubers) for fall-migrating waterfowl.

Effects on Aquatic Food Web - The project features in combination and associated management of Marsh Lake water levels are intended to change the ecosystem state of Marsh Lake from a turbid shallow lake with sparse vegetation to a clearer water vegetated condition.

Sanctuaries and Refuges - The project area is within the Lac qui Parle Wildlife Management Area owned and managed by the Minnesota DNR. Parts of Marsh Lake serve as a refuge for migrating waterfowl in the fall.

Wetlands, Mud Flats and Vegetated Shallows - Marsh Lake is a shallow lake with an extensive littoral zone. All of Marsh Lake is a wetland area. The project would allow for water level management on

Marsh Lake to restore emergent and submersed aquatic vegetation, consolidate sediment, reduce sediment resuspension and reduce abundance of carp. There would be extensive mud flat areas in Marsh Lake in years when it would be drawn down to restore emergent aquatic vegetation. The mud flats would provide excellent habitat for shorebirds.

The PdT River floodplain that would be affected by the new embankment and cut-off berm to restore the river to its former channel is also a wetland area.

Natural Floodplain Areas - Restoring the PdT River to its former channel would restore floodplain processes in the floodplain at the confluence with the Minnesota River.

Effects on Threatened and Endangered Species - As discussed in the 2011 Feasibility Report/EA and in the 2016 SEA, no effects to federally-listed threatened or endangered species would occur in the project area. The Corps has coordinated this determination with the USFWS during the coordination process.

Re-routing the PdT River would result in temporary adverse impacts on state-listed mussel species. Native mussels in the PdT River are expected to re-colonize the restored river channel and result in a net gain in the abundance and spatial extent of native mussels in the river over time.

D. Contaminant Determinations

The fill material would be clean impervious fill from an upland site and rock and that would not introduce contaminants. Neither the material nor its placement would cause relocation or increases of contaminants in the water.

E. Proposed Placement Site Determinations

(1) Mixing Zone Determination

The proposed fill activities would shift the mixing of PdT River water from Marsh Lake to Lac qui Parle. Also a small area downstream of the current spillway would be affected. During construction, the mixing zones would be small and would not constitute a significant problem because of the nature of the fill material and its placement by mechanical means. No liquid material would be discharged during construction. Although conditions will change, no substantial adverse impacts are anticipated. For this reason, the mixing zone was not analyzed further.

(2) Determination of Compliance with Applicable Water Quality Standards

The Corps is currently in the process of obtaining State of Minnesota Section 401 Water Quality Certification from the Minnesota Pollution Control Agency. Construction activities would follow the

water quality requirements stipulated in the Section 401 Certification and any additional permits obtained for this project. The long-term effects of the project would be to increase compliance with state water quality standards in Marsh Lake by reducing suspended sediments.

(3) Potential Effects on Human Use Characteristics

Because of the present and projected human use characteristics, the existing physical conditions, the proposed construction methods, and the nature of the fill material, this proposed action would have no adverse effects on human use characteristics. No municipal supplies would be affected by proposed fill activities. The project would improve conditions in the Marsh Lake ecosystem for human uses like hunting, fishing, and wildlife viewing. During drawdown events, water-based recreation activities may be impacted temporarily. The proposed fill activities would not affect any wilderness areas, research sites or similar preserves.

F. Determination of Cumulative Effects on the Aquatic Ecosystem

Cumulative impacts on the environment are the result of the incremental impacts of past actions, the proposed project and reasonable foreseeable future actions. Significant changes to the environment were made through stream channelization, impoundment, sedimentation, and land-use changes within the watershed. This project is intended to provide long-term habitat conditions and biological connectivity. Effects of the construction would be minimal and mostly positive in maintaining the quality of the human environment. The proposed action would not affect the biodiversity of the area or permanently fragment the habitat above existing conditions. In fact, the project will improve these conditions.

G. Determination of Secondary Effects on the Aquatic Ecosystem

Secondary effects of the project on the aquatic ecosystem would include increased abundance of emergent and submersed aquatic plants, reduced abundance of common carp, clearer water in Marsh Lake, increased populations of native fish, increased use by breeding waterfowl and migrating waterfowl, and increased recreational use of the area.

III. FINDING OF COMPLIANCE WITH RESTRICTIONS ON DISCHARGE

1. The proposed fill activity would comply with Section 404(b)(1) guidelines of the Clean Water Act of 1972, as amended. No significant adaptations of the guidelines were made for this evaluation. As discussed in the 2011 Feasibility Report and Environmental Assessment and the Supplemental Environmental Assessment, the placement of fill for the proposed project is required to achieve the project purpose, which is to benefit the aquatic ecosystem. Therefore, the proposed action is not environmentally damaging to the aquatic ecosystem.

2. The proposed fill activities would comply with all State water quality standards, Section 307 of the Clean Water Act of 1972, as amended, and the Endangered Species Act of 1973, as amended. The proposed fill activity would not have significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Aquatic life and other wildlife would not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity, and stability and on recreational, aesthetic, and economic values would not occur.

3. Certification under Section 401 of the Clean Water Act would be obtained from Minnesota prior to implementation.

4. The project would not introduce hazardous or toxic substances into the waters of the United States or result in appreciable increases in existing levels of toxic materials.

5. The project would have no impact on federally listed threatened or endangered species. Re-routing the Pomme de Terre River would result in temporary adverse impacts on state-listed mussel species. Native mussels in the Pomme de Terre River are expected to re-colonize the restored river channel and result in a net gain in the abundance and spatial extent of native mussels in the river over time.

6. No municipal or private water supplies would be affected. The project would have no significant adverse impacts on recreational or commercial fishing. The effect of this project on human uses of the Marsh Lake ecosystem would be positive.

7. No contamination of the Minnesota or Pomme de Terre Rivers is anticipated. The proposed actions would cause only minimal adverse environmental effects during construction and would have positive cumulative effects on the environment.

8. On the basis of this evaluation, I conclude that the proposed discharges would comply with the Section 404(b)(1) Guidelines for the discharge of dredged or fill material.

29 APR 16

Date

Daniel C. Koprowski
Colonel, Corps of Engineers
District Engineer

Appendix F:

Marsh Lake Ecosystem Restoration Project

Monitoring and Adaptive Management Plan

1. INTRODUCTION

A summary update to the 2011 monitoring plan (Appendix R of the Feasibility Report/EA) is provided below as the foundation for a plan that may evolve to incorporate lessons learned from past monitoring efforts. The purpose of the performance monitoring and Adaptive Management Plan (AMP) is to ensure that monitoring and evaluation of the Project are conducted in order to evaluate the Project for effectiveness and test the hypotheses described herein. The AMP outlines the Corps of Engineers St. Paul District (MVP) plan for monitoring to assess performance levels and designated targets and timelines in meeting project objectives.

This plan identifies and describes the setup of monitoring and adaptive management activities proposed for the project at a conceptual level. The AMP includes generalized cost estimates and duration for implementation and technology transfer.

1.1. Authority

Section 2039 of WRDA 2007 directs the Secretary of the Army (Secretary) to ensure, when conducting a Feasibility Study for a project (or component of a project) for ecosystem restoration, the recommended project includes a plan for monitoring the success of the ecosystem restoration. The Corps of Engineers (Corps) implementation guidance for Section 2039, in the form of a *CECW-PB Memo* dated 31 August 2009, also requires an adaptive management plan be developed for all ecosystem restoration projects. The monitoring plan shall include a description of the monitoring activities, the criteria for success, and the estimated cost and duration of the monitoring as well as specify that monitoring will continue until such time as the Secretary determines that the ecological success criteria have been met.

1.2. AMP Team

The AMP team consists of representatives from MVP, MNDNR, the Upper Minnesota River Watershed District (UMRWD), and U.S. Fish and Wildlife Service (USFWS; Table I-1). Data related to the AMP should be freely exchange between all parties.

Table I-1. Current members of the Marsh Lake Ecosystem Restoration Project AMP.

Agency	Personnel	Title	Contact Info
MVP Corps	Shahin Khazrajafari	Project Manager	Shahin.khazrajafari@usace.army.mil Tel: 651.290.5219
	David Potter	Fishery Biologist	David.f.potter@usace.army.mil Tel: 651.290.5713
	Corby Lewis	Hydraulic Engineer	Corby.R.Lewis@usace.army.mil Tel: 651.290.5806
MNDNR	David Trauba	Regional Wildlife Manager	David.trauba@state.mn.us Tel: 507.359.6030

Agency	Personnel	Title	Contact Info
	Vacant	Area Wildlife Manager	
	Chris Domeier	Area Fisheries Supervisor	Chris.Domeier@state.mn.us Tel: 320.839.2656
	Mike Davis	Malacologist	Mike.Davis@state.mn.us Tel: 507.251.4116
	Luther Aadland	River Scientist	Luther.Aadland@state.mn.us Tel: 218.739.7576
	Ricky Lien	Wetland Habitat Team Supervisor	Ricky.lien@state.mn.us Tel: 651.259.5227
	Nicole Hansel-Welch	Shallow Lakes Program Supervisor	Nicole.hansel-welch@state.mn.us Tel: 218.833.8626
	Joshua Kavanagh	Wildlife Lake Specialist	Joshua.Kavanagh@state.mn.us Tel: 320.354.5530
	Ryan Bjerke	Area Hydrologist	Ryan.Bjerke@sate.mn.us Tel: 320-839-3823
	Jesse Roberts	Permitting	jesse.f.roberts@state.mn.us Tel: 651.259.5175
UMRWD	Dianne Radermacher	Administrator	dianne.radermacher@midconetwork.com Tel: 320. 839.3411
USFWS	Scott Simmons	Big Stone Refuge Manager	Scott_simmons@fws.gov Tel: 320.273.2191

2. PROJECT GOALS, OBJECTIVES, AND PERFORMANCE CRITERIA

The primary goal of the Marsh Lake Ecosystem Restoration Project was developed as part of a coordinated effort on the part of all resource agencies involved in the study. The goal identified in the Feasibility Report is:

> *To return the Marsh Lake area ecosystem to a less degraded and more natural condition by restoring ecosystem structure and functions.*

Based on this goal, project objectives were established and are summarized below:

1. Reduced sediment loading to Marsh Lake.
2. Restored natural fluctuations to the hydrologic regime in Marsh Lake.
3. Restored natural geomorphic and floodplain processes in the Pomme de Terre River (PdT).
4. Reduced sediment resuspension in Marsh Lake.
5. Increased extent, diversity and abundance of emergent and submersed aquatic plants in Marsh Lake.
6. Increased availability of waterfowl habitat in Marsh Lake.
7. Restored aquatic habitat connectivity for fish to migrate between Marsh Lake, the PdT River and Lac Qui Parle.

8. Reduced abundance of aquatic invasive fish species in Marsh Lake.
9. Increased diversity and abundance of native fish within Marsh Lake and the PdT River.

3. MONITORING

The results of an effective monitoring program along with the institutional knowledge and professional judgment of experts involved with the project will be required to determine whether: (1) project outcomes are consistent with original project goals and objectives, (2) adjustments to the objectives or to project features are required (active Adaptive Management), or (3) lessons learned can be documented and applied to future ecosystem restoration projects similar in nature (passive Adaptive Management). The power of a monitoring program developed to support adaptive management lies in the establishment of feedback between monitoring and management. A carefully designed monitoring program and the knowledge base associated with management of shallow lake systems are central components of the Project's adaptive management program.

The following is a description of project objectives and the associated performance criteria (or success metrics). In determining project performance, emphasis will be placed on monitoring data associated with the physical, vegetation, and water quality parameters and that are most closely tied to habitat conditions. While also important, parameters associated with biological response of animals (e.g., migrating waterfowl, colonial waterbirds, or shorebird population size) are not the focus of this monitoring effort as they may be influenced by other factors (i.e., they are several steps removed from the habitat conditions influenced by the project).

For each project objective, performance or success criteria have been identified in Table I-2.

Table I-2. Summary of Marsh Lake Project Objectives and Performance Criteria.

Objectives	Performance Criteria
1. Reduce sediment loading to Marsh Lake	+1.1: By TY5+, 100% of PdT flows conveyed to Lac Qui Parle via original channel.
2. Enhance hydrologic regime to Marsh Lake	+2.1: Fishway (Passive Water Level Management) - By TY5+, achieve water levels at 938.3+ ft during Aug and 937.6+ ft during Sep through Oct > 70% of the time, excluding drawdown years.
	+2.2: Water Level Control Structure - By TY5+, achieve water levels at 936.0 ft from mid-March to October during growing season drawdowns > 70% of the time.
	+2.3: Water Level Control Structure - By TY5+, achieve water levels at 935.0 ft from mid- Nov to mid-March during winter drawdowns > 70% of the time.
3. Restore geomorphic and floodplain processes on the lower PdT River	+3.1: By TY5+, plan-form and profile reach a state of dynamic equilibrium.
	+3.2: By TY5+, similar habitat quality in the affected and unaffected segments.
	+3.3: By TY10, similar mussel population in the affected and unaffected segments in terms of density and composition.
	+ 3.4: By TY5+, similar BMI communities in the affected and unaffected reaches of the PdT River in terms of density and composition.
4. Reduced sediment re-suspension in Marsh Lake	+4.1: By TY5+, average growing season Secchi disc water transparency is 0.7+ m.
5. Increase *EMERVEG* and SAV in Marsh Lake	+5.1: By TY5+, EMERVEG > 1,500 acres; 200 acres other than cattails, contingent on growing season drawdown.
	+5.2: By TY5+ detect SAV at 50%+ of sample sites in 6/10 years after a growing season drawdown.
6. Increase waterfowl habitat in Marsh Lake	+6.1: By TY5+, increase waterfowl use from 6,000 to 25,000 birds; increase diving duck use from 400 to 5,000 birds. At the end of each evaluation period during the Level II monitoring phase, maintain these higher levels.
	+6.2: By TY5+, shorebird use increase from hundreds to thousands during drawdown periods. At the end of each evaluation period during the

Objectives	Performance Criteria
	Level II monitoring phase, maintain these higher levels during drawdown periods.
	+6.3: By TY5+, maintain colonial waterbird numbers in a range between 11,000 to 19,000 American pelican & 500 to 1,000 double-crested cormorant nests.
	+6.4: By TY5+, maintain species diversity associated with nesting islands.
7. Restore aquatic habitat connectivity between the Minnesota River, Marsh Lake, PdT River, Lac qui Parle, and abandoned floodplains.	+7.1: By TY5+, > 80% successful fish passage in the fishway.
8. Reduce abundance of aquatic invasive fish species in Marsh Lake	+8.1: By TY5+, maintain the fish community composition in Marsh Lake to less than 40 percent carp by weight.
9. Increase diversity & abundance of native fish in Marsh Lake and PdT River.	+9.1: By TY5+, increase and maintain species diversity & relative abundance of native fish in Marsh Lake above current levels.
	+9.2: By TY5+, increase species diversity & relative abundance of native fish in the PdT River above current levels.
	+9.3: By TY5+, walleye reproduction in 7/10 years in PdT; northern pike reproduction in Marsh Lake in 3/5 years.

Note: TY = *Target Year*; years in relation to the completion of project construction.

4. ASSESSMENT

4.1. Assessment Process. Appropriate comparisons will be used to summarize monitoring data as they are obtained and compare these data summaries with any decision criteria. These periodic assessments will be critical to determine the need to implement adaptive management features or actively manage the features in a different way.

4.2 Documentation, Reporting, and Coordination. The Communication Plan for this Project will include coordination of all monitoring results, analyses, and implementation plans with the AMP team. The AMP team will produce periodic reports that will measure progress towards project goals and objectives as characterized by the selected performance measures. The results of the assessments will be communicated regularly to the project managers, decision-makers, and stakeholders.

5. DECISION MAKING AND ADAPTIVE MANAGEMENT

5.1. Decision Process

Adaptive management is distinguished from more traditional monitoring in part through implementation of an organized, coherent, and documented decision process. For this project, the decision process includes:

- anticipating the kinds of management decisions that are possible within the original Project design;
- specifying values of performance measures that will be used as decision criteria;
- establishing a consensus approach to decision making; and
- devising a mechanism to document, report, and archive decisions made.

5.2. Decision Criteria and Potential Adaptive Management Measures

Implementation steps for determining the need for adaptive management, as summarized from Fischenich et al. 2012, are:

1) Results of the ongoing monitoring are collated and analyzed by the AMP team to assess whether any performance measures or risk endpoints are triggered.
2) If none of the action criteria are triggered, the adaptive management processes are continued until the next evaluation.
3) If action criteria are triggered, the AMP team will decide whether to implement the adaptive management remedial measures, continue with monitoring, or redress the performance measures (i.e., success criteria or risk endpoints).

Decision criteria, are usually ranges of expected and/or desirable outcomes. They can be qualitative or quantitative based on the nature of the performance measure and the level of information necessary to make a decision. Potential decision criteria will be developed before the project is constructed.

To meet project objectives, active adaptive management will be employed as identified above **unless** it is determined that the additional costs of contingency measures is not warranted relative to the anticipated gain. Essentially this means the AMP team will be regularly monitoring and analyzing the performance of project features, reconsidering project objectives as needed, and making management decisions. Monitoring is expected to occur for at least 5 years after the ecosystem restoration features are completed. Based on the monitoring results, adaptive management may be employed.

The most critical adaptive management measures that may be implemented based on the monitoring results are associated with water level management in Marsh Lake and with the fishway:

- Minor changes to the fishway configuration to meet desired hydraulic conditions necessary to enhance fish passage.
- Change in the duration, timing, and magnitude of seasonal drawdowns in Marsh Lake.
- Changes to the cycle of annual drawdowns (e.g., 2 consecutive years of drawdown followed by 8 years of no drawdown).

As an alternative to changes in water level management, breakwater structures or islands may be constructed in Marsh Lake. A conceptual design identifies three such structures and is described in the 2011 Feasibility Report. With contingencies and escalation, the estimated cost of these structures is over $4 M (2016 dollars). Due to the high cost, this adaptive management feature may be beyond the current authority and thus subject to a new plan or reformulation and/or funding through another program (e.g., Section 1135).

5.3. Project Close-Out

Close-out of the project for MVP would occur when the level of success is determined adequate otherwise stated in the project partnership agreement. The level of success would be based on the extent to which the Project objectives have been or will be met based upon the trends for the site conditions and processes.

Additionally, project close-out will include the last step in the Adaptive Management Framework, which is technology transfer. This includes the dissemination of project monitoring results, analyses performed, management decisions made (Adaptive Management features or adjustments), and lessons learned. Technology transfer will occur via publications, presentations, and discussions with the AMP team and stakeholders.

6. IMPLEMENTATION COSTS, SCHEDULE, AND RESPONSIBILITIES FOR MONITORING AND ADAPTIVE MANAGEMENT

6.1. Costs

The costs associated with implementing the AMP were estimated based on currently available data and information developed during plan formulation and plans and specifications (Table I-3). The estimated total cost for monitoring and adaptive management is about $338,000 ($125,000 for monitoring and $213,000 for adaptive management). Because uncertainties remain as to adaptive management opportunities, the costs estimated may need to be refined during the monitoring period. However,

MVP's share of these costs cannot exceed the cost limitations stated in the project partnership agreement.

6.2. Schedule

A proposed schedule for monitoring is show in Table I-4, which includes baseline, during-construction, and post-construction phases. This schedule assumes construction begins in the fall of 2016 and is completed by spring of 2018.

7. DOCUMENTATION, REPORTING, AND COORDINATION

Communications for the project includes coordination of all monitoring results, analyses, and implementation plans with the AMP team. The AMP team will produce periodic reports that will measure progress towards goals and objectives as characterized by the selected performance criteria. The results of the assessments will be communicated regularly to project managers, decision-makers, and stakeholders.

Table I-3. Summary of Marsh Lake Project Objectives and Performance Criteria.

Objective	Task	Lead	Cost ($US)
1 - Reduce Sediment Loading into Marsh Lake	Monitoring: Seasonal flow measurements on Pomme de Terre River over 2 years	ACE-MVP[a]	$4,994
	TOTAL for Objective		$4,994
2 - Restore Hydrologic Regime to Marsh Lake	Monitoring: Compile yearly data from operations records/gauging stations over 5 yrs	ACE-MVP	$0
	Monitoring: Winter wq measurements over 5 yrs	ACE-MVP[a]	$1,248
	TOTAL for Objective		$1,248
3 - Restore geomorphic & floodplain processes in PdT River	Monitoring: Determine planform on the lower PdT River	ACE-MVP	$1,561
	Monitoring: Determine profile on the lower PdT River	ACE-MVP	$1,561
	Monitoring: Habitat survey	ACE-MVP[a]	$6,242
	Monitoring: Mussel survey	Sponsor	$15,605
	Monitoring: BMI survey	Sponsor	$6,242
	TOTAL for Objective		$31,210
4 - Reduce sediment re-suspension in Marsh Lake	Monitoring: Periodic Secchi disk measurements	Sponsor[b]	$0
	TOTAL for Objective		$0
5 – Increase aquatic vegetation in Marsh Lake	Monitoring: Mapping/remote sensing for EMERVEG	ACE-MVP	$6,242
	Monitoring: Lake-wide survey of EMERVEG composition	Sponsor[b]	$0
	Monitoring: Lake-wide survey of SAV & composition	Sponsor[b]	$0
TOTAL for Objective	**TOTAL for Objective**		$6,242

Objective	Task	Lead	Cost
			($US)
6 – Increase waterfowl habitat in Marsh Lake	Monitoring: Waterfowl use surveys	Sponsor	$9,363
	Monitoring: Shorebird use surveys	Sponsor	$9,363
	Monitoring: Colonial waterbird surveys	Sponsor	$9,363
	Monitoring: Species composition of nesting waterbirds on islands	Sponsor	$9,363
	TOTAL for Objective		$37,452
7 – Restore aquatic habitat connectivity	Monitoring: Hydraulic assessment on fishway	ACE-MVP	$6,242
	TOTAL for Objective		$6,242
8 – Reduce carp abundance	Monitoring: Fish community biomass assessment in Marsh Lake	Sponsor	$6,242
	TOTAL for Objective		$6,242
9 – Increase diversity & abundance of fish	Monitoring: Fish community/IBI surveys in Marsh Lake	Sponsor	$7,803
	Monitoring: Fish surveys on the PdT River	Sponsor	$7,803
	Monitoring: Walleye & northern pike assessment of recruitment, size structure, & reproduction.	Sponsor	$7,803
	Monitoring: Fish passage assessment	Sponsor	$7,803
	TOTAL for Objective		$31,210
	TOTAL MONITORING COSTS		**$124,840**
Adaptive Management	Analysis, Recommendations, & Implementation	ACE-MVP	$197,853
	Analysis	Sponsor	$15,307
	TOTAL for Adaptive Management		**$213,160**
TOTAL MONITORING AND ADAPTIVE MANAGEMENT COSTS			**$338,000**

[a] Work proposed to be completed under Intergovernmental Personnel Agreement with the MNDNR.

[b] Task proposed to be completed under the MNDNR's Shallow Lakes Program or other state-led programs; no project monitoring costs anticipated.

Table I-4. Timeline for baseline, during-construction, and post-construction monitoring tasks by objective.

			Baseline										During Construction		Post-Construction				
Monitoring Task	**Lead**	**TY:**	**-10**	**-9**	**-8**	**-7**	**-6**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**	**0**	**1**	**2**	**3**	**4**	**5**
		Year[a]:	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Objective 1: Sediment Loading																			
Seasonal flow measurements on PdT	ACE-MVP															X		X	
Objective 2: Restore Hydrologic Regime to Marsh Lake																			
Compile yearly data for operations	ACE-MVP													X	X	X	X	X	X
Winter WQ assessment	ACE-MVP													X	X	X	X	X	X
Objective 3: Restore geomorphic & floodplain processes in PdT River																			
Planform of PdT	ACE-MVP																X		
Profile of PdT	ACE-MVP																X		
PdT River habitat	ACE-MVP														X				
Mussel surveys on Pomme de Terre River	Sponsor			X				X									X		
BMI survey	Sponsor														X				
Objective 4: Reduce sediment re-suspension in Marsh Lake																			
Secchi Transparency	Sponsor													X	X	X	X	X	X
Objective 5: Increase aquatic vegetation in Marsh Lake																			
EMERVEG mapping	ACE-MVP														X			X	
EMERVEG species composition	Sponsor														X			X	
SAV species composition	Sponsor			X											X			X	
Objective 6: Increase waterfowl habitat in Marsh Lake																			
Waterfowl use	Sponsor														X				
Shorebird use	Sponsor														X				
Colonial waterbird counts	Sponsor														X				
Colonial waterbird species composition	Sponsor														X				
Objective 7: Restore aquatic habitat connectivity																			
Hydraulic assessment of fishway	ACE-MVP														X				
Objective 8: Reduce carp abundance																			
Fish community biomass	Sponsor		X									X						X	
Objective 9: Increase diversity & abundance of fish																			
Fish community structure/IBI	Sponsor		X									X						X	
Fish survey on PdT	Sponsor		2003									X						X	
Walleye & northern pike assessment	Sponsor																	X	
Fish passage	Sponsor														X			X	
Fish movement/telemetry (Optional)	Sponsor																	X	

[a] Assumes construction begins in fall of 2016.

Appendix G:

Marsh Lake Ecosystem Restoration Project

Pomme de Terre River Floodplain Connectivity

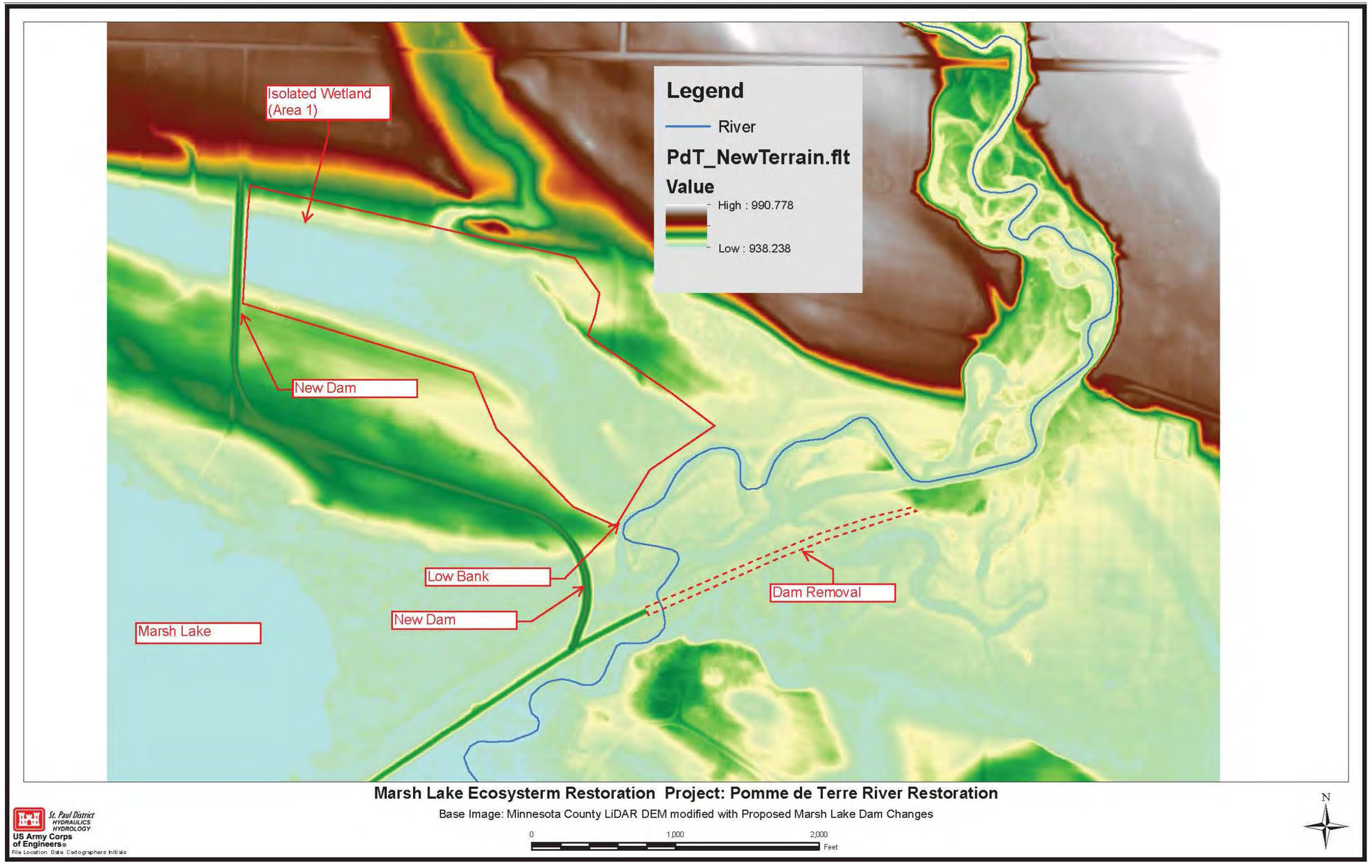
The Marsh Lake Ecosystem Restoration Project has a goal of restoring the Pomme de Terre River to its historic channel and reconnection with its floodplain. Currently the Pomme de Terre River enters Marsh Lake directly above Marsh Lake Dam and is cut off from the lower 7,400 feet of the historic river channel. In order to reconnect the Pomme de Terre River to its historic channel, part of the embankment of Marsh Lake Dam is to be removed and relocated. The Pomme de Terre River floodplain connectivity as a result of these changes is being addressed in this Appendix. All elevation referred to herein are in NAVD88 vertical datum.

Backwater Isolation Due to Construction of New Embankment

The construction of the new embankment of Marsh Lake Dam on the north-south road west of the current location will be cutting off the connection between the Minnesota River and a 13-acre backwater and 37-acre remnant floodplain. See Figure G1 to see the location of the new dam embankment, old dam embankment being removed, the backwater and the Pomme de Terre River. The isolated backwater and remnant floodplain is being referred to as Area 1 on the location map.

Area 1 does have a small, apparent channel connection to the Pomme de Terre River at about construction station C 83+00 of the river channel, with the low bank elevation of about 943.7 ft. This low bank would overtop from Pomme de Terre flows of around 850 cfs, assuming that there isn't high water on the Minnesota River. If the Pomme de Terre flows are low, but the Minnesota River is high then a tailwater at Marsh Lake Dam of about 941.3 ft would overtop the low bank. The annual frequency of overtopping from Pomme de Terre flows is about 50% chance exceedance, compared to the backwater from a Marsh Lake Dam tailwater has a probability of 24%.

Figure G1: Isolated Wetland Connection to Pomme de Terre River



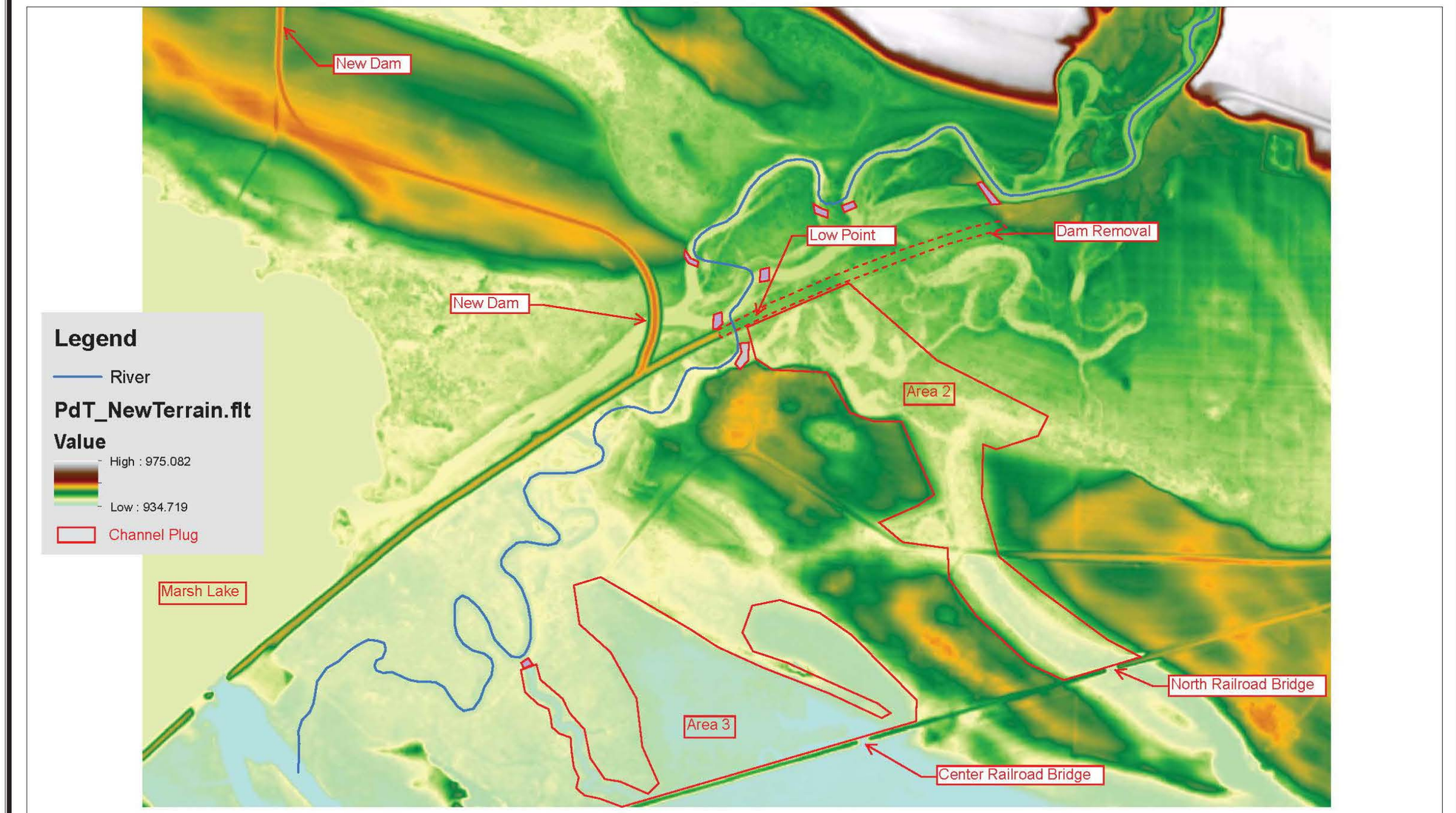
Pomme de Terre River Restoration to Historic Channel

A portion of the existing Marsh Lake Dam embankment will be removed to restore the Pomme de Terre River to its historic channel and let it reconnect to its floodplain. As part of this embankment removal there are two areas that are being affected. These two areas are being referred to Area 2 and Area 3 in Figure G2. Channel plugs are being placed along the existing Pomme de Terre River to redirect flow into the meandering channel. The majority of these channel plugs are being placed upstream of the current Marsh Lake Dam embankment.

Area 2 - This area downstream of the existing Marsh Lake Dam embankment would be reconnected to the Pomme de Terre floodplain following removal of the embankment when the low left bank near river channel construction station C 78+00, with an elevation of about 942.6 ft is overtopped. Pomme de Terre flows of about 600 cfs would overtop the bank here, assuming that the Minnesota River isn't high. If the Pomme de Terre River flows are low, but the Minnesota River is high, the Marsh Lake tailwater elevation of about 940.35 ft backwatered to the site would overtop the left bank. The annual frequency of overtopping from Pomme de Terre flows is about 65% chance Exceedance, compared to the backwater from a Marsh Lake tailwater has a probability of 33.5%. This area would flow to the northern railroad bridge structure crossing the Minnesota River downstream of the Pomme de Terre River.

Area 3 – This area upstream of Channel Plug #1 and downstream of the current Marsh Lake Dam embankment would be reconnected to the Pomme de Terre floodplain following removal of the embankment when the low left bank near river channel construction station C 38+00, with an elevation of about 939.9 ft is overtopped. Pomme de Terre flows of about 350 cfs would overtop the bank here, assuming that the Minnesota River isn't high. If the Pomme de Terre River flows are low, but the Minnesota River is high, the Marsh Lake tailwater elevation of about 938.76 ft backwatered to the site would overtop the left bank. The annual frequency of overtopping from Pomme de Terre flows is about 80% chance Exceedance, compared to the backwater from a Marsh Lake tailwater has a probability of 52.5%. This area would flow to the northern railroad bridge structure crossing the Minnesota River downstream of the Pomme de Terre River.

Figure G2: Pomme de Terre River Restoration and Floodplain Connection



Marsh Lake Ecosysterm Restoration Project: Pomme de Terre River Restoration

Base Image: Minnesota County LiDAR DEM modified with Proposed Marsh Lake Dam Changes

St. Paul District HYDRAULICS HYDROLOGY
US Army Corps of Engineers®
File Location: Date: Cartographers Initials:

0 1,000 2,000 Feet

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