July 2013 version

Environmental Assessment Worksheet

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's (EQB) EAW Process webpage. (EQB, 2020). The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project Title:

Lock and Dam 2 Protective Island Project

2. Proposer:

Contact Person: Trevor W. Cyphers
Title: Fishery Biologist
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City, State, Zip: St. Paul, MN 55101-1678
Phone: 651-290-5031
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3. RGU:

Contact Person: Kathy Metzker
Title: Land Use Hydrologist/Environmental Review Unit
Address: MN Department of Natural Resources-EWR, 500 Lafayette Road North
City, State, Zip: St. Paul, MN 55155
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Fax: 651-296-1811
Email: Kathleen.metzker@state.mn.us

4. Reason for EAW Preparation:

Required	Discretionary
☐ EIS Scoping	☐ Citizen petition
xMandatory EAW	☐ RGU discretion
	☐ Proposer initiated

If EAW is mandatory, give EQB rule category subpart number(s) and name(s): r Minnesota Rules 4410.4300 Subpart 27, Wetlands and Public Waters, Item A.

5. Project Location:

County: Dakota
City/Township: City of Hastings, Nininger Township

PLS Location (¼, ¼, Section, Township, Range) Sections 16, 17, 20, 21 within Township 115N, Range 17W
Watershed (81 major watershed scale): Mississippi River, Lake Pepin
GPS Coordinates: Southwest edge – 44.75484; -92.87797, Center – 44.75701; -92.87342, Northeast edge: - 44.75903; -92.87034
Tax Parcel Number(s):

Dakota County – 19-02000-01-010, 19-01700-88-010, 19-01700-80-010, 19-01600-50-010. For information pertaining to the ownership of the land, see Exhibit 1, USACE ownership.

At a minimum, attach each of the following to the EAW:

- County map showing the general location of the project;
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

Figures and Attachments

- Exhibit 1. USACE parcel information for the Lock and Dam 2 Protective Island Project Area
- Exhibit 2. Lock and Dam 2 Protective Island Project Area pre-construction condition
- Exhibit 3. Lock and Dam 2 Protective Island Project vicinity map
- Exhibit 4. Locations of the dredged material placement sites that will be utilized to construct the protective island
- Exhibit 5. Lock and Dam 2 Protective Island Project Proposed Alternative, including the different features to be incorporated
- Exhibit 6. Lock and Dam 2 Protective Island Project proposed elevations and transition zones
- Exhibit 7. Lock and Dam 2 Protective Island Project proposed vegetation areas and vegetation types
- Exhibit 8. Lock and Dam 2 Protective Island Project material composition
- Exhibit 9. Lock and Dam 2 Protective Island Project constructability features
- Exhibit 10. Alternatives considered for the Lock and Dam 2 Protective Island Project
- Exhibit 11. Recreation opportunities around the Lock and Dam 2 Protective Island Project Area
- Exhibit 12. Aquatic habitat classification of the Lock and Dam 2 Protective Island Project Area
- Exhibit 13. UMRR LTRM classifications of the Lock and Dam 2 Protective Island Project Area
- Exhibit 14. Area of interest for the NRCS WSS tool
- Exhibit 15. Soil boring locations for the Lock and Dam 2 Protective Island Project Area
- Exhibit 16. Minnesota verified wells near the Lock and Dam 2 Protective Island Project
- Exhibit 17. Environmental considerations for the Lock and Dam 2 Protective Island Project
- Exhibit 18. Bathymetry of the upstream portion of the Lock and Dam 2 Protective Island Project Area
- Exhibit 19. State Historic Preservation Office Concurrence Letter, March 2, 2020
- Appendix A.Draft Finding of No Significant Impacts (FONSI) for Federal EA
- Appendix B.Federal Environmental Assessment
- Appendix C. Clean Water Act 404(b)(1)

- Appendix D. Well and boring reports, wells in the Lock and Dam 2 Protective Island Project Area
- Appendix E. Environmental Coordination and Correspondence
- Appendix F. Geotechnical Design and Geology Report
- Appendix G. Sediment Quality
- Appendix H. Section 106 and Native American Consultation

6. Project Description:

a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The U.S. Army Corps of Engineers, St. Paul District is proposing to protect the Lock and Dam 2 embankment from erosion through construction of an offshore protective island. The island would result in a variety of unique habitat types that are not currently present above the Lock and Dam 2 embankment. Some of these habitat types include; wooded/forest, brush/grassland, beach, fish overwintering and emergent wetlands. The island would be constructed with sediments dredged from the Mississippi River.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion, include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

The primary goal of the Lock and Dam 2 Protective Island Project is to protect the embankment from the multiple erosive forces acting on it. A secondary goal of the project is to provide a beneficial use of dredged material within Pool 2. In order to accomplish this, an offshore protective island would be constructed upstream of the existing embankment using dredged material (sand) made up of conventional sand (granular) and fine-grained sand (silts and clays, fine fill or fines) from dredged material placement sites within Pool 2 (Exhibit 4). The design of the protective island would diminish the erosive forces acting on the embankment and allow for a large quantity of dredged material from Pool 2 to be used in a beneficial manner.

An offshore protective island near the Lock and Dam 2 embankment would prevent erosion to the embankment during both low and high water conditions by reducing wind fetch and ice action. The island would be equipped with rock groins and a riprap bullnose structure to provide protection and stability, since the main erosive forces would be acting on the island instead of the embankment (Exhibit 5). The island would provide the necessary protection to the embankment without requiring additional work to the embankment itself (i.e., riprap armoring).

In addition to embankment protection, a number of features would be implemented during construction to provide environmental benefits to the Project Area (Exhibit 5). These features would

include an area of emergent wetland behind the island, an area of overwintering fish habitat, and varying elevations that would sustain different vegetation types (Exhibits 5,6, 7, and 8). Varying vegetation types would result in different terrestrial habitat, which would allow for a greater variety of native species that could utilize these habitats. Higher elevations on the island would provide sustained protection to the embankment during severe flood events.

PROTECTIVE ISLAND IMPLEMENTATION AND CONSTRUCTION

Construction of the protective island would utilize mostly granular dredged materials (sand) for the island base and fine fill for the top of the island (Exhibit 8). A fine fill mixture would be used as a turf to promote vegetation growth that would result in added erosion control, stability and habitat diversity (Exhibit 7). Fine fill material dredged from the access and overwintering cuts would be placed in the emergent wetland area. Prior to filling in the emergent wetland area with fines, part of the island and emergent wetland berm would need to be built in order to contain the fines procured from the access cuts and overwintering area. Granular material for the base of the island and the dry fines for the topsoil would come from dredged material placement sites throughout Pool 2 (Exhibit 4).

The Corps has evaluated the proposed island for general constructability, which includes building the island mechanically, hydraulically or a combination of the two methods. The Corps is not restricting the awarded contractor's construction methodology; however, there would be stipulations in place that the contractor would have to follow. The sections below discuss the different construction options, features, Best Management Practices and how the proposed project construction would potentially be implemented.

ISLAND CONSTRUCTION

As mentioned above, the Lock and Dam 2 Protective Island Project could be constructed using mechanical, hydraulic, or a combination of both options. During construction the awarded contractor would implement Best Management Practices to reduce the negative impacts associated with the island construction (e.g., install silt curtains and other mechanical barriers, implement natural erosion control products, reduce the spread of invasive species). The contractor would submit an environmental protection plan to demonstrate how best management practices would be used during the construction process. Any federal, state or local ordinances would be followed to minimize construction impacts. Finally, the contractor would follow any requirements established by the Minnesota Public Waters Work Permit and other required permits.

Mechanical construction would utilize barges, excavators and bulldozers to implement the proposed project. Granular sand would be excavated mechanically from dredged material placement sites (Exhibit 4) within Pool 2 and moved via barges to the Project Area to construct the island base. Once the necessary amount of material is excavated from the placement sites, the contractor would shape the finished stockpiles to provide positive drainage. The action of removing and placing sand at the temporary placement sites, and any potential impacts attributed to those actions, are discussed and covered (NEPA compliance) under the 1997 CMMP. These actions are permitted by

the Minnesota Department of Natural Resources (MN DNR) via a Public Waters Work General Permit (**See 8. Permits and Approvals**).

If necessary, the contractor would access the new island footprint by dredging access channels in the proposed locations and building construction pads to assist with the construction of the island base (Exhibit 9). Any access dredged material generated from this process would need to be handled in the proper manner (See Access Dredging section below).

Granular fill would be placed in the island footprint using an excavator and shaped to the specified elevations, likely via a bulldozer (Exhibit 6). Once the emergent wetland berm and necessary island sections are constructed, fines from access cuts and the fish overwintering area could be dredged mechanically and placed within the emergent wetland area (Exhibits 6, 9). After the base of the island is constructed to match the necessary specifications, dry fines would be placed in the designated areas to provide a base for vegetation (Exhibit 8). Dry fines would be moved mechanically via barge from dredged material placement sites in the same fashion as granular material. Rock for the bullnose features and rock groins would be placed mechanically in a fashion to produce a well-graded mass with minimal void spaces. Best Management Practices for mechanical construction could include, but are not limited to: reducing the bucket height of excavators placing material and implementing silt curtains or other mechanical barriers to minimize sediment spread and release during island construction.

The proposed island base could also be constructed using hydraulic dredging equipment. This would likely involve bringing dry granular material from the dredged material placement sites via barge and placing it into a hopper barge near the Project Area that can re-slurry granular material. This mixture of sand and water would then be pumped with hydraulic dredging equipment into the island footprint. During this process, parts of the island could be constructed from a distance. This process would provide the necessary containment needed for the placement of fine materials into the emergent wetland area by constructing the necessary berms around this area. Fines from the access cuts and the fish overwinter area could be placed within the emergent wetland area using hydraulic dredging equipment. Best Management Practices for hydraulic construction could include, but are not limited to: utilizing berms to contain pumped sediments when appropriate, controlling the pumping rate to minimize spread and resuspension, and using silt curtains or other barriers to contain sediment spread.

With either construction method, visual monitoring of sediment plumes or TSS sampling during construction may be included as conditions attached to the MN DNR's Public Waters Work General Permit, with work stopped if TSS exceeds a maximum value established in the permit and resumed only after TSS fall to a concentration established as safe.

If the contractor has the capability, they could also construct the proposed island using a combination of mechanical and hydraulic construction equipment. As mentioned previously, the construction method would be left up to the contractor and likely driven by cost. The contractor would be responsible for providing the finished proposed project in a manner that is best suited for their operation while minimizing environmental damage and adhering to any permit requirements.

Permit requirements would likely include guidelines on turbidity and would specify the levels that would be acceptable during construction.

ISLAND CONSTRUCTION TIMING

Due to the project location and nature of the construction, nearly all the work would require the use of marine equipment, thus limiting construction to the open water season on the UMR. Construction in certain years can begin in April, but May is a more typical month for beginning construction due to the constraints associated with ice and spring high water. The construction season usually lasts until late November when work must stop due to winter freeze-up. The implementation year for the proposed project would depend on the availability of funds. Based on the current O&M budget and project priorities within the St. Paul District, it is estimated that construction of this project would begin during the 2021 construction season. The construction associated with this project would likely take multiple field seasons (up to three construction seasons) to fully implement.

ACCESS DREDGING

The proposed project has the potential to generate access dredged material (fines) that the contractor would need to store in the proper fashion. If the emergent wetland berm and the island around the emergent wetland area is completed, access dredged material could be placed within the emergent wetland area to begin the establishment of the emergent wetland. If this portion of the island is not constructed, access dredged material would need to be contained or stored in barges or moved to one of the authorized dredged material placement sites (Exhibit 4).

CONSTRUCTION STAGING AREAS

In order for the contractor to complete the proposed project, land within the Corps' Lock and Dam 2 facility would be provided as a construction staging area (Exhibit 9). This would provide the contractor with an area to get construction equipment and other necessary material to the Project Area in order to complete the proposed island. This area includes a barge loading and unloading area that would utilize the Corps' loading platform at the far south of the Lock and Dam 2 facility. The staging area would also provide space for parking and a construction trailer, if necessary. The contractor would provide signage indicating which areas would be closed off to the public for safety reasons. If any alterations or disturbances made to the staging area are of a type or a magnitude that requires a permit (i.e., Stormwater Pollution Prevention Plan), this would be procured by the contractor prior to construction. Permit guidelines would likely include the use of best management practices (i.e., sandbags, silt curtains) to reduce the effects of stormwater runoff within the staging area. After construction, the contractor would restore the staging area to the original condition.

PROTECTIVE ISLAND CONSTRUCTION FEATURES

EMERGENT WETLAND CONSTRUCTION

The emergent wetland area would be positioned on the interior or embankment side of the island and be contained by the island and the emergent wetland berm. (Exhibit 5, 6). Fine fill material procured from the fish overwintering area and access dredging cuts (if applicable) would be placed within the wetland area to promote wetland plant growth. The average elevation of the wetland would be set to 0.5 feet below Low Control Pool (LCP) or 658.6' (NAVD 88). The final elevation of the fine material would be variable by plus or minus one foot of elevation, which would provide varying habitat and promote a variety of wetland plants. The wetland is designed so that, once finished, this area would be classified as either a Type 3 (shallow marsh) or Type 4 (deep marsh) wetland type. This emergent wetland would not be seeded, as it would likely be under water during construction. Instead, it is anticipated that this area will self-vegetate with local emergent wetland plants. The elevation of the emergent wetland should discourage the establishment of invasive species (i.e., reed canary grass) due to the high likelihood of inundation throughout the growing season. After the emergent wetland area is constructed, the emergent wetland berm would be scored or breached in multiple places to the current pool level to promote the passage of water between the emergent wetland and the river. Granular material from the scoring or breaching process would be incorporated or spread into the emergent wetland area.

FISH OVERWINTERING AREA

The fish overwintering area would be used as a source for the fine fill material necessary for the emergent wetland area. This area would be dredged at two varying elevations, six and eight feet below LCP (Exhibit 5). Once completed, this dredged area would provide a unique habitat for fish that is currently not available within the Project Area.

ISLAND SEEDING AND VEGETATION

Upon constructing the base of the island using granular sand, the contractor would bring in dry fines for soil and turf establishment from approved dredged material placement sites within Pool 2 (Exhibit 4). The depth of fines placed on the granular sand would be dependent on the elevation of the island and would vary between 24, 18 and 12 inches (Exhibit 8), which coincides with the seeding and vegetation plan (Exhibit 7). Seeding would involve the contractor covering all fine fill areas with either permanent native grasses or a winter wheat mixture. Winter wheat would be utilized if the permanent native grasses could not be established before the end of the growing season. The winter wheat mixture would provide winter erosion protection and temporary surface erosion control. If winter wheat is used, the contractor would establish native grasses the following construction season. The mixes used for seeding would be certified free of invasive species and would be appropriate for the local habitat. Willow planting would be implemented on the exterior and interior of the 12 inch fine fill areas (Exhibits 7 and 8). Planting would consist of two rows of willows, two feet apart and staggered. Once native grasses and willows are fully established, a mixture of native tree species would be planted within the 24 and 18 inch fine fill areas (Exhibit 7),

as part of a separate contract. The exact composition and planting plan of these trees would be decided upon by the Corps' Environment Section located in La Crescent, MN.

ROCK GROINS

Rockfill for both the rock groins and bullnose structure would consist of R140 riprap from an authorized commercial quarry. Rock would not be placed until after the base of the island or the granular sand is in place. Rockfill could be barged to the island and placed using mechanical equipment (e.g., excavators) from the new island base or placed from the water via excavator barge. Once complete the rock groins and bullnose structure would provide structural integrity to the island.

c. Project magnitude:

Type	Amount
Total Project Acreage	38.8 to 44.2*
Linear project length	3000 feet
Number and type of residential units	0
Commercial building area (in square feet)	0
Industrial building area (in square feet)	0
Institutional building area (in square feet)	0
Other uses – specify	Wildlife habitat
Structure height(s)	NA

*: the size of the protective island itself is 38.8 acres. Up to an additional 5.4 acres may need to be dredged in the river to provide access to the project area.

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The goal of the Lock and Dam 2 Protective Island Project would be to protect the current earthen embankment and implement a beneficial use of dredged material. The earthen embankment along with Lock and Dam 2 maintains the water surface elevation in Pool 2, making it a vital structure within the area. As mentioned above, the major stressors acting on the embankment are long wind fetch and moderate ice action, resulting in reoccurring degradation and erosion. Lessening or eliminating these stressors on the earthen embankment would ensure the longevity of the structure. A secondary purpose of the project is to enhance wildlife and natural ecosystem functions by creating varied natural habitats in the river.

Beneficiaries of the proposed project would include users of the Mississippi River navigation system, taxpayers who pay for maintenance of the lock and dam system, local residents who would otherwise be harmed if the embankment were to fail, and recreationists who would take advantage of the increased recreational opportunities created by construction of the island.

e. Are future stages of this development including development on any other property planned or likely to happen, Yes or No? No

f. If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review. Not applicable

g. Is this project a subsequent stage of an earlier project, Yes or No? Yes
If yes, briefly describe the past development, timeline and any past environmental review.

The project is linked to the Corps' ongoing management of the Nine-Foot Navigation Channel Project. For that reason, this project is considered a phased action of two previously reviewed projects: Pool 2 Dredged Material Management Plan (DMMP) and Lower Pool 2 Channel Management Study (CMS): Boulanger Bend to Lock and Dam No. 2. The DMMP addresses long term management and storage of sediments dredged from the Mississippi to maintain channel navigability, and is currently under development. The Channel Management Study (1996) and its Environmental Impact Statement (EIS; 1997) describe the Corps' plan for channel management and maintenance in Pool 2. Both the Pool 2 DMMP and the CMS are supplements to the Corps' Channel Maintenance Management Plan (CMMP).

7. Cover Types:

Estimate the acreage of the site with each of the following cover types before and after development:

Cover Type	Before	After
Wetlands	0.0	9.3
Deep water/streams	38.8	8.6*
Wooded/forest	0	2.8
Brush/Grassland	0	7.6
Cropland	0	0
Lawn/landscaping	0	0
Impervious Surface	0	0.9**
Stormwater Pond	0	0
Other (4.7 acres beach habitat, 4.9 acres littoral zone))	0	9.6
Total	38.8	38.8

*8.6 acres fish overwintering habitat
** riprap

An additional 5.4 acres of open water may be affected if access channels must be dredged. Although the river in these areas will be deepened, the cover type for this additional area will not be changed.

8. Permits and approvals required:

List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental reviews has been completed. See Minnesota Rules, Chapter 4410.3100.*

Unit of Government	Type of Application	Status
MN DNR	Public Waters Work Permit	Not yet applied for
Minnesota Pollution Control Agency	Clean Water Act Section 401 Water Quality Certification	Not yet applied for
	National Pollution Discharge Elimination System (NPDES) Permit	Will apply for if required

Planning for the overall project has been coordinated with the public, state and federal agencies, and other interested parties. Detailed descriptions of compliance efforts for certain regulations can be found in the coordination appendix (Appendix E).

The activities associated with the proposed project and the construction of the protective island would result in the placement of fill into waters of the United States. For this reason, a Clean Water Act Section 401 Water Quality Certification from the State of Minnesota would be requested by the Environmental Compliance Branch of the Corps, which would be based on the Corps' 404(b)(1) evaluation of the proposed project (Appendix C).

In compliance with the Fish and Wildlife Coordination Act, project plans and potential impacts were coordinated with the Minnesota/Wisconsin Ecological Services Field Office on March 9th, 2020 via telephone call. During this conversation the USFWS concurred with the Corps' determination that the proposed project would have no effect on Federally-listed threatened and endangered species within the Project Area. Federal and state agencies will have the opportunity to review and comment on the project during the public review of the EA.

The Corps would submit an application to the MN DNR for a Public Waters Work Permit. The action of removing and placing any dredged material (granular or fine sand) on temporary placement sites during the Lock and Dam 2 Protective Island Project is covered under a MN DNR Public Waters Work General Permit (General Permit Number: 1994-5082). The Corps' existing SDS permit (MN0050580) for management and reuse of dredged material also applies to the management of dredged materials for this project, and the Corps will not need an additional permit for this purpose. Some additional permits and environmental planning may fall under the responsibility of the contractor conducting the proposed project. The contractor would be responsible for construction permits as necessary, such as a National Pollution Discharge Elimination System permit. These responsibilities would be detailed in the Specification document provided to the contractor.

Visual monitoring of sediment plumes or TSS sampling during construction may be included as conditions attached to the MN DNR's Public Waters Work General Permit, with work stopped if TSS exceeds a maximum value established in the permit and resumed only after TSS fall to a concentration established as safe in the permit.

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

9. Land Use:

a. Describe:
   i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The Lock and Dam 2 Protective Island Project Area is located at the downstream end of Pool 2 near the right descending bank of the Mississippi River at RM 815.2 (Exhibit 3), in the city limits of Hastings, Minnesota. The pool is part of the Mississippi River's lock and dam system, which manages commercial navigation on the Mississippi River. The river's navigation channel, to the east of Pool 2, is maintained at a depth of nine feet by periodic dredging to facilitate navigation. Pool 2 is also used for aquatic recreation. The pool is on the upstream side of the lock and dam's embankment. On the downstream side is Lake Rebecca, which was once a side channel lake (King Lake) of the Mississippi River before construction of the lock and dam.

Land use surrounding Pool 2 is a mix of public lands, agricultural land, forests, wetlands, and low density residential neighborhoods. The area surrounding the Project Area has a number of scenic

lookouts that provide the opportunity to observe the landscape of the UMR. The embankment itself contains a walking trail that can be utilized to see the surrounding areas (i.e., Lake Rebecca, Pool 2). Other areas of interest near the Project Area include the Spring Lake Park Reserve, which includes Schaar's Bluff Trail and lookout; Gray Cloud Dunes Scientific and Natural Area (SNA); Spring Lake Island Wildlife Management Area (WMA); and Lake Rebecca Park (Exhibit 11).
The neighborhoods nearest the Project Area are Eagle Bluff and Featherstone Road, which would be most impacted by the proposed project. The neighborhood closest to the Project Area, Eagle Bluff, contains around 80 residential parcels, 13 of which are adjacent to the Mississippi River. This neighborhood is classified as a River Neighborhood by the MRCCA district classification, while Featherstone Road is not visible from the river and classified as a district Separated from the River.

RECREATIONAL OPPORTUNITIES

In the past, poor water quality has limited the recreational value of Pool 2, although recent improvements and interest in the water quality of this region have been increasing the potential for recreational activities. As of 2004, there were 11 boat accesses and 5 marinas in Pool 2. The lower section of Pool 2 is less developed than the rest of the pool and offers fishing and boating opportunities. Private docks and accesses are also scattered throughout the region, including several docks at the southern end of the pool near the Lock and Dam 2 embankment. The Project Area encompasses several walking and biking trails, specifically the Mississippi River Regional Trail, which is a partially completed 27-mile trail within Dakota County. A section of this trail lies within the Project Area and crosses the Lock and Dam 2 embankment. Other recreational opportunities just south of the Project Area include Lake Rebecca Park and Jaycee Park. Lake Rebecca Park is situated around parts of Lake Rebecca and has a boat launch, fishing pier and picnic tables. Jaycee Park has a number of picnic tables and benches and includes a boat launch and dock, providing access to Pool 3 of the UMR (Exhibit 11).

LAND USE AND COVER TYPES

The Project Area is located almost entirely within the UMR floodplain. According to the UMR aquatic habitat classification system (Wilcox 1993), the north side of the Project Area is impounded aquatic habitat, while the south side is classified as lake habitat (Exhibit 12). According to the Minnesota National Wetland Inventory (NWI), the Project Area has a mixture of riverine, lake and freshwater pond habitat. From a wetland standpoint there are both emergent wetlands and forested/shrub wetlands on the downstream side of the embankment (Exhibit 13). Using the Upper Mississippi River Restoration (UMRR) Program – Long Term Resource Monitoring (LTRM) data there are a total of seven different class descriptions (of 15 total class descriptions) within the Project Area. These classifications include: open water, road/levee, developed, wet forest, shallow marsh, deep marsh, submersed aquatic vegetation, and upland forest (Exhibit 13).

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

Because the Project Area is within the MNRRA and MRCCA corridors, many of the surrounding government units have comprehensive plans to guide planning and development activities in accordance with the rules governing these areas. These rules were updated in 2017, and all MRCCA communities are currently in the process of adopting new comprehensive plans and ordinances for the

MRCCA. In general, these plans are in place to preserve and enhance the natural and aesthetic resources of the UMR and MNRRA and MRCCA corridors.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

Land adjacent to the Project Area is classified within the Dakota County Comprehensive Plan into two distinct MRCCA districts, Rural and Open Space (CA-ROS) and River Neighborhood (CA-RN). In Hastings, land in the MRCCA near the Project Area is classified as CA-ROS, CA-RN, and Separated from River (CA-SR). Minnesota Rules 6106.0100 defines the character of these districts, and their management requirements, as follows:

Rural and open space district (CA-ROS):

- The rural and open space district (CA-ROS) is characterized by rural and low-density development patterns and land uses, and includes land that is riparian or visible from the river, as well as large, undeveloped tracts of high ecological and scenic value, floodplain, and undeveloped islands. Many primary conservation areas exist in the district.
- The CA-ROS district must be managed to sustain and restore the rural and natural character of the corridor and to protect and enhance habitat, parks and open space, public river corridor views, and scenic, natural, and historic areas.

River neighborhood district (CA-RN):

- The river neighborhood district (CA-RN) is characterized by primarily residential neighborhoods that are riparian or readily visible from the river or that abut riparian parkland. The district includes parks and open space, limited commercial development, marinas, and related land uses.
- The CA-RN district must be managed to maintain the character of the river corridor within the context of existing residential and related neighborhood development, and to protect and enhance habitat, parks and open space, public river corridor views, and scenic, natural, and historic areas. Minimizing erosion and the flow of untreated storm water into the river and enhancing habitat and shoreline vegetation are priorities in the district.

Separated from river district (CA-SR):

- The separated from river district (CA-SR) is characterized by its physical and visual distance from the Mississippi River. The district includes land separated from the river by distance, topography, development, or a transportation corridor. The land in this district is not readily visible from the Mississippi River.
- The CA-SR district provides flexibility in managing development without negatively affecting the key resources and features of the river corridor. Minimizing negative impacts to primary conservation areas and minimizing erosion and flow of untreated storm water into the Mississippi River are priorities in the district.

Similarly, the Hastings municipal Comprehensive Plan classified most of the land adjacent to the Project Area as an Urban Diversified District, meaning the lands and waters within this district should be developed to maintain the present diversity of commercial industrial, residential, and public uses of the land. This land classification should also protect historical sites, natural areas, environmental resources, and expand public access to and enjoyment of the river. The proposed project is consistent with the management goals as expressed in the communities' comprehensive plans.

The Project Area and adjacent lands are in the shoreland district of the Mississippi River and in the MRCCA Rural and Open Space (CA-ROS) and River Neighborhood (CA-RN) Districts. CA-ROS districts are rural undeveloped and developed low density residential land that is riparian or visible from the river and often contains tracts of high quality ecological resources, while CA-RN is developed residential land and existing or planned parkland that is visible from the river or borders riparian parkland. The planned project is consistent with the goals of these districts.

The Project Area is in the 1% annual chance floodway (Zone AE) on FEMA Flood Hazard Panels 27037C0144E and 27037C0163E (effective 12/2/2011) for unincorporated Dakota County. The proposed work is consistent with Dakota County's floodplain ordinance.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

Nearby land uses include residences, outdoor recreation, conservation, and commercial navigation. The proposed project would be compatible with these land uses and would enhance recreation and conservation goals. The proposed island would also be compatible with the different MNRRA and MRCCA plans in place by the local governmental units, as it would provide additional environmental resources, aesthetic value and recreation opportunities to the immediate Project Area. Also, the proposed island would not impact any extant historical sites and natural areas.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

No land use incompatibilities were identified, and therefore no mitigation has been proposed.

10. Geology, soils, and topography/land forms:

a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

The proposed Project Area is on the UMR in a glacial valley, located in the Central Lowlands Physiographic Province. Regional topography in Dakota County is comprised of undulating till covered highlands with large outwash plains divided by modern streams. The UMR is entrenched in a glacial valley with steep riverbanks that can reach upwards of a few hundred feet in height. Upland areas on both banks of the river have a thin mantle of glacial soils overlying sedimentary rock, with bedrock consisting of alternating layers of limestone, siltstone, shale, and sandstone. The primary bedrock formation, known as the Franconia Formation, consists of fine grained sandstone approximately 60-80 feet thick. This formation can be found at varying elevations across the valley from 500 to 600 feet (NAVD88).

Lock and Dam 2 and the embankment are primarily situated on alluvial and lacustrine deposits consisting of poorly graded sands, sands/silts, and silts/gravels. The most recent sediments were predominantly deposited by modern streams during episodes of flooding. In the early Holocene (10,000 years ago), Lake Pepin formed as the Chippewa River Delta impounded the Mississippi River. Early Lake Pepin is thought to have existed downstream of the Project Area to St. Paul, MN. During the impoundment of Lake Pepin large amounts of clays

were deposited within the Project Area. These deposits consisted of interbedded fat clays and silts up to 50 feet thick. The deposits of clay stratum have resulted in settlement and rotation of the original lock walls.

No sinkholes, shallow limestone formations, or karst conditions exist in or near the Project Area.

See Chapter 3.2.1 of the EA (Geomorphology) and the Geotechnical Design and Geology Report (Appendix F) for further information.

b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii

Soil information for the Project Area is derived from the National Resources Conservation Service (NRCS) Web Soil Survey (WSS) and is described in Table 3 below (also see Exhibit 14). Soil borings taken near the Project Area indicate that near surface soils consist of alluvial sands or lacustrine clays. The alluvial sands are typically loose at the surface but increase in density with depth. Underlying the alluvial and lacustrine deposits is the bedrock unit known as the Franconia Formation, which consists of fine grained sandstone approximately 60-80 feet thick. This formation can be found at varying elevations across the valley from 500 to 600 feet (NAVD88).

Soil borings were also used to determine the subsurface composition of the Project Area, which then helped determine island alignment (Exhibit 15). The alignment was chosen in an attempt to avoid the deepest and softest clay deposits to reduce island settlement and material displacement during construction. Though the thickest layer of clays would be avoided through the realignment, there would still likely be some settlement of sand with the construction of the Proposed Project. To compensate for settlement, material would be placed in a fashion that would build up the base of the island before the necessary allotment is placed to achieve the desired island elevations. The necessary fill to construct the island would be calculated to adjust for island settlement.

Due to the geomorphology of the Project Area, construction could cause lateral movement of the underlying (existing) substrate, often referred to colloquially as a “mud-wave”. Lateral displacement could occur in a semi-liquid fashion, in which the material is simply “squeezed” outwards from beneath the fill in a plastic fashion, where soil masses or wedges of material would be displaced outwards from the fill. The displacement of this material would only be expected to occur during sand placement or construction, and would result in a more variable substrate elevation around the islands.

Additional information regarding geomorphology of the Project Area, the expected behavior of mudwaves, and the design considerations made to minimize and mitigate the consequences of mudwaves, can be found in Appendix F, Geotechnical Design and Geology Report.

Table 3. NRCS soil descriptions from the WSS for the Project Area and the surrounding landscape.

Dakota County, Minnesota (MN037)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
39A	Wadena loam, 0 to 2 percent slopes	8.3	3.20%
98	Colo silt loam, occasionally flooded	20.5	7.80%
611F	Hawick loamy sand, 20 to 40 percent slopes	13.2	5.00%
1027	Udorthents, wet	18.9	7.20%
1055	Aquolls and Histosols, ponded	15.4	5.90%
1821	Algansee sandy loam, occasionally flooded	2.5	0.90%
W	Water	182.6	69.90%
Totals for Area of Interest (AOI)		**261.2**	**100.00%**

11. Water resources:

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii.

i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The proposed project would take place in the impounded aquatic area above the Lock and Dam 2 embankment. This section of the Mississippi River is classified as “U.S. Lock and Dam #2 Pool (DOW Lake ID Number 19000500). The shoreland classification of the Lock and Dam 2 impoundment is General Development (GD). Other designated public waters within one mile of the Project Area include "Lake Rebecca” (DOW Lake ID Number 19000300), which has a shoreline classification of Natural Environment (NE) and is listed as impaired for aquatic consumption due to mercury. The Project Area is not within a designated wild, scenic, or recreational river segment; however, it is within the Mississippi National River and Recreation Area (MNRRA) and Mississippi River Corridor Critical Area (MRCCA). The Lower St. Croix River, designated as a recreational river segment, flows into the Mississippi River four river miles downstream of the Project Area, beyond Lock and Dam 2. There are no designated wildlife lakes, trout lakes or streams, or calcareous fens identified within or near the Project Area. Water quality impairments within one mile of the project are listed in the tables below.

Table 4. Public water basins within one mile of the Project Area.

Basin Name	DOW Lake ID Number	Shoreland Classification	Impairments or other Special Characteristics
Lock and Dam #2 Pool	19000500	General Development (GD)	See Mississippi River, below
Lake Rebecca	19000300	Natural Environment (NE)	Impaired for Aquatic Consumption Due to Mercury; TMDL for Mercury

Table 5. Public water courses within one mile of the Project Area.

Watercourse	Shoreland Classification	Location	Impairments or other Special Characteristics
Mississippi River	Transition	Throughout the Project Area	Impaired for Aquatic Consumption, Aquatic Life, Aquatic Recreation, Aluminum, Fecal Coliform bacteria, nutrients, PCBs, PFOS, Total Suspended Solids (TSS). TMDLs approved for mercury, TSS.
Unnamed	Tributary	S36-T27N-R21W	
Unnamed	Tributary	S35-T27N-R21W	Impaired for Aquatic Life (fish bioassessment)

According to the Minnesota National Wetland Inventory (NWI) the Project Area has a mixture of riverine, lake and freshwater pond habitat. From a wetland standpoint there are both emergent wetlands and forested/shrub wetlands on the downstream side of the embankment (Exhibit 13).

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this. The project is not expected to have any groundwater impacts. The following considerations contributed to this determination:

1. Depth to groundwater at the proposed Project Area would be 0 feet as dredged material would be placed into open water and on the existing bed of the river.
2. The Project Area is not within a wellhead protection area (WHPA) as of July 15, 2019, the date of the data provided on the Minnesota Department of Health website (Exhibit 3): https://gisdata.mn.gov/dataset/water-wellhead-protection-areas

There are nine known wells near the Project Area. Of these, two are active, one is sealed and six have an unknown status (Exhibit 16). Well and Boring Reports of all wells depicted in Exhibit 16 can be found in Appendix D.

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv.

i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

N/A

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

N/A

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

N/A

The Proposed project would not produce any traditional wastewater through the construction and implementation process. Possible hydraulic construction of the island and emergent wetland would involve carriage water; however, this water would come from the river and would not be altered chemically. This action would comply with any requirements established by the Minnesota Public Waters Permit or other required permits.

ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

N/A – No stormwater impacts are anticipated at the island construction site as the project would be constructed within an existing water body. The work may require establishment and use of equipment staging areas on land (Exhibit 9). If this is necessary, the contractor would be responsible for acquiring any permits associated with stormwater runoff (i.e., NPDES permit). In a related manner, the awarded contractor would implement an erosion and sediment control plan utilizing Best Management Practices as part of their environmental protection plan. These Best Management Practices could include using sandbags or silt curtains to reduce the effects of potential stormwater runoff within staging areas. Specifically, if the staging area results in a disturbance greater than one acre, an NPDES permit would be necessary. This permit would require redundant Best Management Practices to reduce the effects of stormwater runoff from these areas.

iii. Water appropriation: Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or

required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

N/A- the project will not involve water use.

iv. Surface Waters:

1) Wetlands: Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

The majority of the Project Area on the upstream side of the Lock and Dam 2 embankment is open water and inundated with water year round (Exhibit 11). The long wind fetch and current riprap on the upstream side is not conducive for plant growth, resulting in minimal wetlands, if any. No existing wetlands are identified within the project footprint. The project would create 9.3 acres of emergent wetland habitat (type 3 or 4 wetlands). Construction of the emergent wetland is further discussed within the Project Description (Question 6) above.

2) Other surface waters: Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

This project would involve the placement of fill in public waters, as well as excavation of a fish overwintering pool and the possible deepening of some parts of the river to provide easier channel access. This would change the bed profile in the pool. Placement of the fill for the island could cause the underlying, existing substrate to squeeze outwards from underneath the fill, resulting in a more variable bottom profile in the pool. See Chapter 3.2.1 of the EA (Geomorphology) and Appendix F (Geotechnical Design and Geology Report) for further information on how fill at the Project Area may interact with the existing riverbed.

The Project Description (Question 6) describes the proposed project features and how they would be constructed, including the Best Management Practices that would be applied to avoid and minimize turbidity and sedimentation during construction. Best Management Practices for mechanical construction could include, but are not limited to: reducing the bucket height of excavators placing material, visual monitoring of sediment plumes or TSS sampling if deemed necessary through the MN DNR's Public Waters Work General Permit, and implementing silt curtains during island construction. Best Management Practices for hydraulic construction could include, but are not limited to: utilizing berms to contain pumped sediments when appropriate, visual monitoring of sediment plumes or TSS sampling if deemed necessary through the MN DNR's Public Waters Work General Permit, and implementing silt curtains during island construction. Construction activities would adhere to any

permit requirements pertaining to turbidity and remain below any maximum permit-established thresholds during construction.

The water within the existing Project Area is quite turbid in nature. Part of the turbidity issue has to do with the large windfetch. Once the project is complete, windfetch within this area will be reduced by the presence of the island, resulting in lower turbidity throughout the Project Area, especially the area behind the island. Further impacts regarding the water quality are discussed in chapter 4.2.5 of the EA, while aquatic habitat impacts are discussed in chapter 4.2.1 of the EA.

The specific changes in water surface (i.e., impounded aquatic habitat) from an acreage standpoint can be seen above in Cover Types heading of this EAW and in Appendix C (404(b)(1). analysis).

This project is anticipated to increase recreational usage within the vicinity of the proposed island, which would mean a potential increase in personal watercraft (e.g., motor boats, kayaks, and canoes) within the area (See chapter 4.1.3 of the EA). The potential effects of the island construction within the extant impounded water area are further discussed in the Clean Water Act Section 404(b)(1) analysis (Appendix C).

12. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions. Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

   See chapter 3.2.6 of the EA and Appendix G for information pertaining to the existing sediment within the Project Area and the sand makeup that would be utilized for island construction. In general, the existing sediment where construction of the proposed island would take place is relatively clean and free of any contaminants. There are no known hazardous material or wastes within the existing Project Area.

b. Project related generation/storage of solid wastes. Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

   The only solid waste that would be generated by the proposed activities within the Project Area would be fine sediments dredged from access channels and the fish overwintering habitat. Materials generated from these actions would be incorporated into the emergent wetland area south of the proposed island. If the sediments are not incorporated into the island, they would be contained or stored in barges or moved to one of the authorized dredged material placement sites (Exhibit 4). Sediment testing of the Project Area has demonstrated this material is free of contaminants and suitable for this use. Though it is not anticipated, any excess construction material left over after project completion (i.e., sand, riprap) would be properly handled and removed in compliance with Federal, State and local laws and regulations.

c. Project related use/storage of hazardous materials: Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

The only expected hazardous materials to be used during the proposed construction would be fuels and oils generated from or used by construction equipment within the island construction and staging areas. Handling, storage and disposal of this hazardous waste would be conducted to prevent contamination, following standard industry Best Management Practices. As part of the Corps' contracting procedure, any contractor would be required to prepare and submit for approval a Spill Prevention and Control Plan for these materials prior to construction. Though no hazardous wastes are anticipated with this project, the contractor would dispose of any in compliance with Federal, State and local laws or regulations.

d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

No hazardous waste is expected to be generated or stored during project construction or operation.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

FISHERIES

The diversity and quality of the fish community in the Upper Mississippi River is influenced by many factors, including (but not limited to) ease of and barriers to migration, availability of spawning habitats, effects of invasive species, and water quality. Numerous fishery surveys have been conducted in the Upper Mississippi Pool 2 area, although most have been conducted with an emphasis on sport fishes. These sampling techniques will not assess every fish species within the pool, and therefore should not be considered an accurate representation of the fish community as a whole. Nevertheless, these surveys have identified 78 species of fish that are either known to occur presently or in the past in Pool 2. Of these, 17 are classified as either abundant or common, two historic (i.e., not collected within the last 10 years), and four are likely to occur through stray tributaries or inland stocking (Steuck et al. 2010, Table 6). These numbers are similar to the 1995 fish distribution assessment that was completed through the Upper Mississippi River Conservation Committee; this survey estimated that Pool 2 contains 74 total species, 20 of which are abundant or common, 3 historic and 4 likely to occur through stray tributaries or inland stocking (Pitlo et al. 1995).

Fish species most likely to be impacted within the Project Area are those that utilize shallow, slack-water habitat. The Project Area downstream of the embankment includes Lake Rebecca, which the DNR identifies as an oxbow lake. Past surveys conducted by the DNR, in 2012 and 2018, indicated that 17 and 8 fish species

(respectively) were present within Lake Rebecca. These surveys were completed with an emphasis on sport fish populations; therefore, provide less data on non-sport fish species.

Table 6. Abundant and common fish species within Pool 2 (adapted from Steuck et al. 2010).

Common Name	Scientific Name	Species Abundance
Black crappie	*Pomoxis nigromaculatus*	Common
Bluegill	*Lepomis macrochirus*	Common
Channel catfish	*Ictalurus punctatus*	Common
Common carp	*Cyprinus carpio*	Abundant
Emerald shiner	*Notropis atherinoides*	Abundant
Freshwater drum	*Aplodinotus grunniens*	Abundant
Gizzard shad	*Dorosoma cepedianum*	Abundant
Quillback	*Carpiodes cyprinus*	Common
Sauger	*Sander canadensis*	Common
Shorthead redhorse	*Moxostoma macrolepidotum*	Common
Silver redhorse	*Moxostoma anisurum*	Common
Smallmouth bass	*Micropterus dolomieu*	Common
Sand shiner	*Notropis stramineus*	Common
Spotfin shiner	*Cyprinella spiloptera*	Common
Spottail shiner	*Notropis hudsonius*	Common
Walleye	*Sander vitreus*	Common
White bass	*Morone chrysops*	Common

Mussels

Mussel surveys compiled from Kelner (2017) for Pool 2 indicates there are 32 current and 9 historic species for a total of 41 potential mussel species within the pool (Table 7). Federally-listed endangered Higgins eye (*Lampsilis higginsii*), winged mapleleaf (*Quadrula fragosa*), and snuffbox (*Epioblasma triquetra*) mussels are rarely found within Pool 2. These three federally-endangered species were re-introduced into Pool 2 by the Corps beginning in 2001 and annually through 2012. Of these species, only Higgins eye has shown evidence of recruitment within Pool 2. Sheepnose (*Plethobasus cyphyus*) mussels, another federally-listed endangered species, have only been found historically (pre-1980) in Pool 2.

In September 2017, the Corps completed a pre-project mussel survey within potential impact areas, using a skimmer dredge designed for sampling the riverbed. (Exhibit 17). During this survey a total of 12 mussel transects were completed, which yielded 48 live mussels encompassing 8 different species, with no additional dead specimens found. Of the mussels that were observed, over 77% were from transects in areas near the existing Lock and Dam 2 embankment (i.e., shoreline habitat). This indicated that the best mussel habitat within the Project Area is nearest the existing shoreline. Once Project Alternatives were further refined, an additional sampling effort was completed by the Corps in June 2018, which focused on evaluating the offshore island footprints. The 2018 sampling effort incorporated nine additional mussel transects, which yielded one live mussel (*Quadrula quadrula*). Combining all mussel data from 2017 and 2018 indicates that the four most abundant mussel species were *Fusconaia flava* (30.6%), *Amblema plicata* (22.4%), *Quadrula quadrula* (20.4%) and *Obliquaria reflexa* (10.2%, Table 8).

During the 2017 sampling event a single live individual of a Minnesota State-threatened species (*Quadrula nodulata*) was found in the proposed Project Area; however, the 2018 surveys did not yield any additional state-threatened or endangered species (Exhibit 17). It is unlikely that the Proposed Project would have an adverse effect on this species as it is considered common in Pool 2 (Table 7). Additionally, no Federally-listed species, living or dead, were observed during mussel surveys. Mussel surveys conducted within the Project Area did not reveal any intact mussel beds and indicated relatively poor mussel habitat (Table 8).

Any native mussels within the fill and dredging footprint of the proposed island footprint would likely be destroyed, resulting in a single minor adverse impact to the native mussel population within the Project Area. Once fully implemented, the proposed island would provide additional shoreline habitat within the Project Area. As mentioned above, most of the mussels collected during surveys were found along shoreline habitat of the existing embankment. This is likely due to the granular sand and rock-riprap that the shoreline habitat contains, which is a substrate type that is favorable for many mussel species. The completed offshore island would greatly increase this habitat type within the Project Area. The shoreline habitat at the completed protective island would remain relatively free of fine-grained sand due to wave action. For these reasons, the Proposed Alternative would likely result in a minor long-term benefit towards the biological productivity of native mussels within the Project Area.

Table 7. Known mussel species within Pool 2 of the UMR.

Species	*Scientific name*	Species Distribution
Threeridge	*Amblema plicata*	Abundant
Wabash pigtoe	*Fusconaia flava*	Common
Washboard	*Megalonaias nervosa*	Rare
Round pigtoe	*Pleurobema sintoxia*	Rare
Winged mapleleaf	*Quadrula fragosa*	*Re-established Rare
Monkeyface	*Quadrula metanevra*	Rare
Wartyback	*Quadrula nodulata*	Common
Pimpleback	*Quadrula pustulosa*	Abundant
Mapleleaf	*Quadrula quadrula*	Abundant
Pistolgrip	*Tritogonia verrucosa*	Rare
Elktoe	*Alasmidonta marginata*	Rare
Rock pocketbook	*Arcidens confragosus*	Common
White heelsplitter	*Lasmigona complanata*	Rare
Fluted shell	*Lasmigona costata*	Rare
Giant floater	*Pyganodon grandis*	Common
Strange floater	*Strophitus undulatus*	Common
Paper pondshell	*Utterbackia imbecillis*	Rare
Mucket	*Actinonaias ligamentina*	Rare
Butterfly	*Ellipsaria lineolata*	Rare
Snuffbox	*Epioblasma triquetra*	*Re-established Rare
Plain pocketbook	*Lampsilis cardium*	Common
Higgins eye	*Lampsilis higginsii*	*Re-established Rare
Fatmucket	*Lampsilis siliquoidea*	Rare
Fragile papershell	*Leptodea fragilis*	Common
Black sandshell	*Ligumia recta*	Con
Threehorn wartyback	*Obliquaria reflexa*	Abundant
Hickorynut	*Obovaria olivaria*	Rare
Pink heelsplitter	*Potamilus alatus*	Common
Pink papershell	*Potamilus ohiensis*	Rare
Lilliput	*Toxolasma parvus*	Rare
Fawnsfoot	*Truncilla donaciformis*	Rare
Deertoe	*Truncilla truncata*	Abundant

*Re-established Rare = Species that have been captured since 2005 and were once extirpated from the area, red font indicates recent collections by MN DNR since 2005 (Davis and Sietman unpublished data).

Table 8. Mussel species richness and abundance at Lock and Dam 2 Protective Island Project Area utilizing skimmer dredge surveys from September 2017 and June 2018.

		Offshore Island		Total	
Species	Common Name	No.	%	No.	%
Subfamily Ambleminae					
Amblema plicata	Threeridge	2	18.2	11	22.4
Fusconaia flava	Wabash pigtoe	3	27.3	15	30.6
*Quadrula nodulata**	Wartyback	1	9.1	1	2.0
Quadrula quadrula	Mapleleaf	3	27.3	10	20.4
Subfamily Anodontinae					
Pyganodon grandis	Giant floater			1	2.0
Subfamily Lampsinilinae					
Leptodea fragilis	Fragile papershell			3	6.1
Obliquaria reflexa	Threehorn wartyback	1	9.1	5	10.2
Potamilus ohiensis	Pink papershell	1	9.1	3	6.1
Total live		11		49	
Total species		6		8	
Sled transects (n)		12		21	
Mussels per transect		0.9		2.3	

* Represents Minnesota state threatened mussel species.

Vegetation

The Project Area is underwater and unvegetated. Adjacent land within one mile of the Project Area includes a Red Oak-Sugar Maple-Basswood (Butternut Hickory) forest at the southern end of Lake Rebecca. Project activities would not affect this forest. Construction of the protective island would create wetland habitat, providing an opportunity for establishment of wetland vegetation.

Aquatic Habitat

The U. S. Fish and Wildlife Service (USFWS) publication, "An Aquatic Habitat Classification System for the Upper Mississippi River System" (D.B. Wilcox 1993), has been used to classify aquatic areas within the UMR. A majority of the Project Area, specifically upstream of the embankments, is defined as impounded, which is a large, mostly open area that is located in the downstream portions of the navigational pool. Downstream of impounded habitat usually includes the navigational dam and connecting dike (Wilcox 1993). The impounded habitat at the Project Area is relatively shallow in depth (Exhibit 18). The shoreline of the Lock and Dam 2 embankment is classified as General Development (GD). Other classifications within the Project Area, mainly Lake Rebecca, can be classified as an artificial abandoned channel lake (Wilcox 1993). Lake Rebecca was once a side channel lake

(King Lake) of the Mississippi River prior to the creation of the Lock and Dam 2 embankment in 1928. Other aquatic habitat on the downstream portion of the Project Area includes both deep and shallow marsh habitat with areas of submerged aquatic vegetation (Exhibit 13). The Project Area above the embankment has a Federal Emergency Management Agency (FEMA) designation of floodway Zone AE, while the area below the embankment is outside of the floodway, but still in Zone AE, meaning the area is subject to a 1-percent-annual-chance flood event.

Wetlands

Wetlands are areas that are inundated or saturated by surface and ground water at a frequency to support vegetation typically adapted to saturated soils, which include swamps, marshes, bogs and similar areas (Eggers 1997, MN DNR 2013). Most of the Project Area on the upstream side of the Lock and Dam 2 embankment is open water and inundated year round (Exhibit 13). The long wind fetch and current riprap on the upstream side is not conducive for plant growth, resulting in minimal wetlands, if any. The downstream side of the Lock and Dam 2 embankment contains wetlands around Lake Rebecca and the eastern side of the embankment. These wetlands include deep and shallow marsh wetlands, along with wet forest habitat (Exhibit 13).

Terrestrial Habitat

The Project Area is within the Eastern Broadleaf Forest province, which serves as a transition zone between the semi-arid regions to the west that were historically prairie and the mixed coniferous-deciduous forests of the northeast (Aaseng et al. 2011). Most of the vegetation within this province consists of forests of broad-leaved deciduous trees, including oaks, maples, basswood, and elm with smaller areas of oak savanna and prairie (Marschner 1974). Terrestrial habitat closer to the Project Area includes upland forest, upland meadows, floodplain forests, wetlands, and areas disturbed by commercial and residential development (Exhibit 13). The land within the Lock and Dam 2 facility that would be utilized by the contractor for staging purposes is considered developed and would mostly be restricted to existing parking lots and concrete surfaces. The minimal vegetation in this area is a mixture of maintained grasses and some native plants and trees. The north side of the embankment closest to the Project Area has little to no vegetation, as it is mostly covered with rock riprap. The southern portion of the structural embankment contains a 15-foot zone vegetated with a variety of grass species but otherwise kept vegetation-free. This area transitions into a mixture of marsh and wet forest habitats that contain plants typical to these environments.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-) and/or correspondence number (ERDB #) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

Threatened and Endangered Species

Federally-Listed Threatened and Endangered Species

Six federally-listed endangered or threatened species have been known to occur within or near the Project Area (Table 9). An endangered species list was generated using the USFWS' Information for Planning and Consultation

(IPaC) website (07/31/2020). The USFWS' IPaC website was consulted to determine if any listed, proposed, or candidate species may occur in the Project Area, or if the area contains any designated or proposed critical habitats. No designated or proposed critical habitats were identified in the Project Area.

Table 9. Federally-listed species having the potential to be present within the Project Area.

Species	Scientific Name	Status	Group
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Mammal
Higgins Eye	*Lampsilis higginsii*	Endangered	Mussel
Sheepnose Mussel	*Plethobasus cyphyus*	Endangered	Mussel
Snuffbox Mussel	*Epioblasma triquetra*	Endangered	Mussel
Prairie Bush-clover	*Lespedeza leptostachya*	Threatened	Plant

Northern long-eared bat

Suitable habitat for northern long-eared bat (*Myotis septentrionalis*) is variable depending on the season and life stage. In the summer, bats often roost under the bark of tree species within diverse mixed-age and mixed-species tree stands, commonly close to wetlands. In the winter, the northern long-eared bat hibernates in caves and abandoned mines. During periods of migration and foraging, these bats tend to use edge habitat where a transition between two types of vegetation occurs (USFWS 2015).

Higgins eye

Suitable habitat for Higgins eye (*Lampsilis higginsii*) includes deep water areas of various stable substrates in large streams and rivers with moderate current (USFWS 2004). Although rare, live specimens of the Higgins eye have been found recently in Pool 2 of the UMR (Kelner 2017). Higgins eye are most commonly associated with diverse, high-density mussel beds.

Sheepnose

Suitable habitat for sheepnose (*Plethobasus cyphyus*) is typically shallow areas of large rivers and streams that contain moderate to swift currents with substrate containing coarse sand and gravel (USFWS 2012). Sheepnose have only been found historically in Pool 2 (pre-1980, Kelner 2017).

Snuffbox

Suitable habitat for snuffbox (*Epioblasma triquetra*) is usually small to medium-sized streams with swift current and some larger river systems (USFWS 2012). Snuffbox are recently re-established within Pool 2 (Kelner 2017).

Prairie bush-clover

Prairie bush-clover (*Lespedeza leptostachya*) is a threatened plant species found only in the tallgrass prairie region of Wisconsin, Minnesota, Illinois and Iowa. It is a member of the bean family and holds a unique niche within the tallgrass prairie ecosystem. Prairie bush-clover provides habitat for tiny predatory insects that are specialized to live within seeds (USFWS 2009).

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*), though no longer listed or protected under the ESA, is still protected under the Bald and Golden Eagle Protection Act (Eagle Act). This act prohibits anyone from taking or disturbing a bald or golden eagle or their nest. USFWS guidelines to comply with the act indicate that no construction activity should occur within 660 feet of a visible bald or golden eagle nest in order to lower the chance of disruption, especially during the breeding season. If an eagle nest is within the area of the proposed project, work would be postponed until after breeding season, which is from December through July for the Northern United States (USFWS 2007). There is at least one active eagle nest within the Project Area that was observed by the Corps in July 2019 (Exhibit 17).

State-Listed Rare Species

In addition to federally listed species, there are a number of state-listed species and terrestrial communities that have the potential to reside within the Project Area (Table 10). These species were compiled through the Minnesota Natural Heritage Information System (NHIS) using a one-mile buffer within the Project Area (September, 2019). The date of most recent recorded observation for each species was also determined through the NHIS to better indicate the possibility of each species being present within the Project Area.

Table 10. Minnesota state-listed species and communities within one mile of the Project Area.

Scientific Name	Common Name	MN Status	Last Observed
Mussels			
Actinonaias ligamentina	Mucket	THR	2001
Alasmidonta marginata	Elktoe	THR	Pre-2000
Arcidens confragosus	Rock Pocketbook	END	2013
Cumberlandia monodonta	Spectaclecase	END	Pre-2002
Ellipsaria lineolata	Butterfly	THR	Pre-1944
Elliptio crassidens	Elephant-ear	END	2004
Epioblasma triquetra	Snuffbox	END	Pre-2002
Eurynia dilatata	Spike	THR	2003
Lampsilis higginsii	Higgins Eye	END	2010
Lampsilis teres	Yellow Sandshell	END	Pre-2001
Lasmigona costata	Fluted-shell	THR	Pre-2002
Ligumia recta	Black Sandshell	SPC	2009
Plethobasus cyphyus	Sheepnose	END	1988
Pleurobema sintoxia	Round Pigtoe	SPC	2013
Quadrula fragosa	Winged Mapleleaf	END	Pre-2002
Quadrula nodulata	Wartyback	THR	2011
Reginaia ebenus	Ebonyshell	END	2004
Simpsonaias ambigua	Salamander Mussel	END	2004
Theliderma metanevra	Monkeyface	THR	2008
Tritogonia verrucosa	Pistolgrip	END	2008
Venustaconcha ellipsiformis	Ellipse	THR	Pre-2002
Fish			
Acipenser fulvescens	Lake Sturgeon	SPC	2019
Polyodon spathula	Paddlefish	THR	2019
Amphibians			
Necturus maculosus	Mudpuppy	SPC	2016
Birds			
Falco peregrinus	Peregrine Falcon	SPC	1989
Lanius ludovicianus	Loggerhead Shrike	END	2012
Vireo bellii	Bell's Vireo	SPC	2007
Terrestrial Communities			
Red Oak - Sugar Maple - Basswood - (Bitternut Hickory) Forest			
White Pine - Oak - Sugar Maple Forest			
Southern Wet Cliff			
Dry Bedrock Bluff Prairie (Southern)			
Oak - (Red Maple) Woodland			

(END = Endangered; THR = Threatened; SPC = Special Concern)

MN DNR staff from the Natural Heritage Information System (NHIS) conducted a data review of reported current and historical occurrences of state-listed species of special concern, as well as rare features, to identify and assess potential impacts to these phenomena in the Project Area as a consequence of the proposed work.

Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Federally- and State-Listed Species

The Proposed Project is not expected to have any effect on federally-listed threatened or endangered species. The construction of the island would fall within impounded open-water river habitat, and therefore would not impact terrestrial species (i.e., northern long-eared bat, prairie bush-clover). Only aquatic species (mussels) would have the potential to be affected by the Proposed Project. No federally-listed mussel species and only one specimen of a state-listed species (*Quadrula nodulata*) were found in the proposed project area and surveys, in general, indicate the Project Area is relatively poor mussel habitat. Therefore, while project construction may result in the incidental taking of *Q. nodulata*, the project itself would ultimately have beneficial effects on this and other mussel species found in the area by improving mussel habitat.

Work within the Project Area would comply with the Eagle Act and would not have an effect on known bald eagles within the Project Area.

Another State-listed species, mudpuppy (Necturus maculosus, special concern), has the potential to exist near the Project Area, as it is fully aquatic. The Proposed Project is not anticipated to impact the mudpuppy, as they prefer rivers with rock and gravel substrate. As mentioned in Section 3.2.1 (Geomorphology) of the EA and 10.b of the EAW, the Project Area substrate is primarily made up of interbedded fat clays and silts, which would not represent optimal mudpuppy habitat. Other state-listed species would not be impacted by the Proposed Alternative due to their life strategies and ability to move out of the area during construction (i.e., fish and birds, Table 10).

No plant communities are expected to be adversely affected during construction. The riverbed in the project area is unvegetated, Creation of the island would provide opportunities for establishment of native wetland and upland plants, and would therefore have a beneficial effect on the plant communities in the area.

See Chapter 4.2.3 of the EA for further discussion of the potential project effects to Federal and State-listed species within the Project Area. Terrestrial species (i.e., reptiles, mammals, birds, etc.) that have the potential to occupy the surrounding Project Area (i.e., the embankment) would not be impacted by the proposed project as construction would take place in water.

Invasive species

Equipment and watercraft utilized throughout the construction of the project would be previously cleaned to prevent the spread of invasive species. This would include insuring that equipment and watercraft are free of soil residuals, egg deposits from plant pests, noxious weeds, aquatic plants and animals and residual water. The contractor would clean equipment based on the MN DNR's Best Practices for Preventing the Spread of Aquatic

Invasive species. Further, the contractor would devise a plan to prevent the spread of invasive species during the construction process as part of the Environmental Protection Plan.

Because the dredged sediment piles (Exhibit 4) are open to the atmosphere, wind and animals may have carried seeds or plant fragments of invasive species to them, creating a possible seed bank for terrestrial invasive species. To minimize the possibility of introduction of terrestrial invasive species from these areas, the upper layers of the dredged piles would be used to create the basal and interior layers of the island. Sediments for the surface layer of the island would come from the interior of the dredged sediment piles. These sources are unlikely to have a viable terrestrial invasive species seed bank. Establishment of terrestrial invasive species would be further discouraged by deliberately seeding the island with native plants to encourage competition.

Once the proposed island is constructed and fines added, the island would be seeded with a mixture of native grasses and willows appropriate to the created habitats. Native seed mixtures would be checked for and certified free of invasive species prior to application. In general, this planting process would contest against potential invasive species (i.e., reed canary grass, buckthorn) inhabiting the newly constructed island.

c. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

The construction of the offshore island and any activities associated with it are not expected to cause impacts to organisms within or near the surrounding terrestrial habitat. Any associated impacts to these areas or organisms stemming from activities (i.e., turbidity, sedimentation) are anticipated to be minimal. There is an active eagle nest near the Project Area, which will be avoided according to the Bald Eagle Act (1962, as amended). Fish are not expected to be adversely harmed, since they can move away from the project site and the riverbed in the Project Area is not used for spawning. No other specific actions are planned under the proposed project to further avoid, minimize or mitigate adverse effects of constructing the protective island.

14. Historic Properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

The whole of Pool 2 and the surrounding landscape contains or contained numerous historic properties indicating continual human occupation over approximately the last 12,000 years. Historic properties include a variety of pre-contact and historic archaeological sites. Pre-contact sites include lithic and artifact scatters, village sites, petroglyphs, and burial mounds. Historic sites include Dakota villages, trading posts and forts, early town sites, standing structures, shipwrecks, transportation corridors, bridges and river training structures. Several historic properties within this locality are listed on the National Register of Historic Places (NRHP) or are eligible for listing on the NRHP. In addition, the pool contains several historic districts.

Lock and Dam 2 is a significant feature. It was completed in 1930 as part of the six-foot channel project. It is unique in having all tainter gates and a Boule pass structure. A second landward lock was completed in 1948 to accommodate the 9-foot channel project specifications. Sometime after 1947 and before 1974 an oil tank field

was established south of the lock. The tank field was removed in the 1990s and an above surface pipeline running along the toe of the downstream side of the embankment was removed in 1994.

Construction of Lock and Dam 2 has significantly changed the river and its immediate surroundings, resulting in the possible flooding or destruction of some cultural resources. Prior to construction ofthe dam, this stretch of the Mississippi River floodplain consisted of side channels, sloughs, wetlands and natural levees. From west to east, the dam embankment transects a slough (King Lake, Lake Rebecca) running along the western edge of the valley, as well as a series of swales and ridges (natural levees), before encountering the lock structure and associated improvements (e.g., control house, parking lot, comfort station, Electronic Communication Center). The embankment cut off the slough and truncated relict natural levees while the landward lock removed or otherwise altered most of a natural levee formed along the right descending bank of the main channel. An analysis of the pre-inundation landforms in the Project Area used the Mississippi River Commission (MRC) 1895 chart as a proxy for elevations. Low lying areas (e.g., swales and wetlands) average approximately 680 feet above mean sea level (amsl). Areas thought to coincide with natural levees approach elevations of approximately 690 feet amsl. Pool 2 is currently maintained with a water surface elevation of approximately 687 feet amsl, equating to a water level rise of approximately 12 feet since 1930. By 1937, much of the floodplain was inundated, although narrow islands along the main channel-the tops of natural levees-remained. By 1953 these features are absent. Recent bathymetry indicates that the depth of the river bottom just upstream of the embankment ranges between approximately three to four feet. From this information, it appears that approximately a minimum of six to seven feet of the natural levees have eroded across the area. In other areas, approximately three to four feet of overburden/sedimentation blankets the pre-lock and dam land surfaces. Any cultural resources that may have existed near the upstream side of the embankment would have been destroyed by fluvial action or deeply buried from subsequent silt deposition.

In addition to inundating the floodplain, embankment construction during the 1920s involved clearing vegetation, stripping the topsoil and stockpiling the spoil on the upstream and downstream sides of the embankment corridor. The space between the spoil piles was then dredged. Dredging depths are uncertain, although deep enough to reach solid sand. Next, fill material was hydraulically placed to create the earthen embankment and the removed topsoil presumably placed over the sand fill. Finally, stone rip-rap was placed over the embankment. As a result, the cut and fill activities would have destroyed cultural resources that may have existed along the embankment and adjacent areas.

Previous investigations near the Project Area include exploration of burial mounds, identification of military roads, transportation features, and standing structures. Previous consultations (i.e., 1981, 1986, 1993) with the Minnesota State Historic Preservation Office (SHPO) for hydroelectric installation and removal of the lock house determined that the complex was not eligible for listing on the NRHP. Other than the lock and dam, no other cultural resources have been identified within one mile of the Project Area. A SHPO concurrence letter for this project is presented as Exhibit 19.

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The Project Area itself lies within the MNRRA and MRCCA corridors, making it an important natural area. In general, governmental plans in these areas are established to preserve and enhance the natural and aesthetic resources of the UMR. Any action that would result in the aesthetic enhancement of the area would align with these plans. The area surrounding the Project Area has a number of scenic lookouts that provide the opportunity to observe the unique landscape of the UMR. The embankment itself contains a walking trail that can be utilized to see the surrounding areas (i.e., Lake Rebecca, Pool 2). Areas outside of the Project Area includes the Spring Lake Park Reserve, which includes Schaar's Bluff Trail and lookout (Exhibit 11).

The Proposed Project would have a temporary minor adverse effect on aesthetics within the Project Area during construction. This would be due to construction equipment and activity and unfinished work, which may be unsightly to local residents. The construction process could take multiple construction seasons, prolonging the impacts on the aesthetics of the Project Area. Once the proposed island is completed and the vegetation develops, the Proposed Project would provide substantial aesthetic benefits to the Project Area. The overall aesthetic enhancement due to the proposed island would align with the different governmental MNRRA and MRCCA comprehensive plans that are currently in place for this stretch of the river.

16. Air:

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

   N/A

b. Vehicle emissions. Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The Proposed Project would require the use of construction equipment. This action would result in a minor adverse impact on air quality throughout the Project Area, as well as a small increase in greenhouse gas emissions. This effect would be temporary in nature and air quality would return to normal conditions once construction ceases.

c. Dust and odors. Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The construction of the Proposed Project would require the placement of dredged material into water, which would likely not create dust emissions within the Project Area. In a similar fashion, riprap for the bullnose feature and rock groins would either be placed in water or from the island once the required portions are constructed. The placement of riprap would likely not generate a noticeable amount of dust because the majority of riprap would be placed underwater. Any riprap placed on land would likely generate minimal amounts of dust and would not travel far from the immediate riprap placement. The top of the island would be capped with fine material that is wet in nature, making dust emissions minimal. In general, dust emissions generated from the Proposed Project would be negligible. There is a chance that the fine-material and construction equipment would generate unpleasant odor within the Project Area during construction, but this would dissipate quickly once activities cease.

17. Noise:

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Noise levels within the Project Area are similar to that of other semi-populated UMR reaches or areas. Though the Project Area is not densely populated, there are a few neighborhoods in the vicinity that would receive noise pollution. The Project Area is also close to Lock and Dam 2, which generates noise pollution due to commercial navigation. Like other areas along the UMR, the Project Area has occasional to frequent commercial and recreational boat traffic. Noise levels increase as commercial and recreational watercraft move through the Project Area and decrease as watercraft depart from the area. In general, the Project Area experiences higher noise levels during daylight hours when boat traffic and recreational usage is typically higher.

The Proposed Project would have a temporary minor negative effect on the noise level within the Project Area. Noise levels would increase during the construction of the Proposed Project, specifically affecting the homes east in Eagle Bluff and Featherstone Road neighborhoods. To minimize noise within the Project Area, the awarded contractor would comply with any state regulations and/or local ordinances regarding construction operations. Contractors would be required to use equipment that meets federal or other applicable environmental and noise requirements, including mufflers. This limitation would reduce noise pollution for the neighborhoods closest to the Project Area during construction. After construction, the Proposed Project would result in less of a need to repair the embankment due to the protective benefits the island would provide, resulting in a long term beneficial effect on noise levels through the elimination of periodic future maintenance activities.

18. Transportation:

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

N/A

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at the Minnesota Department of Transportation Access Management webpage)* or a similar local guidance (MNDOT, 2020).

N/A

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

Dredged material necessary to construct the proposed project would be brought into the Project Area via barges from the temporary placement sites in Pool 2; therefore, no further transportation impacts, specifically truck traffic, are expected to occur during the construction of the proposed island. The barges necessary to transport material to the Project Area are not expected to deviate from normal barge traffic within Pool 2. Island construction is outside of the navigation channel, so any incomplete work at the end of the construction season would not impact river traffic or transportation. If the project is not complete following a given construction season, signage and markers would be added to inform the public to minimize any hazards posed to recreational or other traffic in the project area. See Chapters 3.1.4 and 4.1.4 of the EA for additional information regarding commercial navigation and barge traffic within Pool 2.

19. Cumulative potential effects:

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

Identification of project related Environmental Effects

The construction of the proposed island would result in temporary minor adverse effects to noise, aesthetic values, air quality and surface water quality within the Project Area, which may occur over multiple construction seasons, and cease once construction is complete. The proposed project would have a one-time impact on biological productivity within the island footprint due to the initial placement of sand for island construction.

The completed island project would result in a permanent loss of unvegetated aquatic habitat within the Project Area; however, it would add permanent wetland and upland habitat and increase underwater habitat structural features such as fish overwintering areas, bottom surface variation, and submerged sand and rock substrate. Overall, this would result in a permanent improvement in aquatic, wetland, and terrestrial habitats.

The construction of the island and other associated projects within Pool 2 would provide benefits to commercial navigation by providing a beneficial use for sediments dredged from the navigation channel, thus prolonging the life of the dredged sediment storage areas and improving navigational channel maintenance.

Once completed, the island would decrease wind-driven turbidity in the pool by providing a wind break and reducing the wind fetch in the Project Area. This would result in a permanent improvement in water quality.

In general, the geographic scale of all environmental effects is expected to be limited to the Project Area surrounding the island. Therefore, this project would not result in additional cumulative effects on other Corps projects within Pool 2.

Identification of Geographic Area and Timeframe for Environmental Effects

The timeframe for construction of the Lock and Dam 2 Protective Island Project has the potential to begin in the 2020 construction season; however, implementation would likely not begin until the 2021 construction season. There is a possibility that the proposed island would take multiple field seasons to fully construct and implement, anywhere from one to three construction seasons. Also, the construction timeframe could vary due to funding, seasonal flooding and unforeseen environmental factors. Due to the nature of the project, construction season would align with the open water season on the UMR. Construction in certain years can begin in April, but May is a more typical month for beginning construction due to the constraints associated with spring high water. The construction season usually lasts until late November when work must stop due to winter freeze-up. The overall geographic timescale of the propose project would be one to three years once the construction process begins during the described construction season. Once constructed, the environmental effects due to the presence of the island itself would be permanent.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Reasonably Foreseeable Projects

As described in Chapters 1.5 and 4.4 of the EA, the Lower Pool 2 Channel Management Study, Pool 2 DMMP, and Pigs Eye Lake are underway or planned for Pool 2. The local governments of Dakota County, Hastings and Nininger Township have comprehensive or master plans in place to preserve and enhance the natural and aesthetic resources of the MNRRA and MCCRA corridors. Most of these plans are updated on a 10-year cycle and dictate what will happen over a 20-year period (i.e., Dakota County Comprehensive Plan). The island project would align with these plans and provide an overall aesthetic and recreational enhancement to the area. At this time there are no other projects from other local or state entities that are anticipated to overlap or result in cumulative environmental effects within the Project Area. This is due to the fact that construction of the island would take place in water and have little impact on projects taking place on the land surrounding the Project Area.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Due to the nature of the project and the requirement of dredged material, the Lock and Dam 2 Protective Island Project is linked to projects that deal directly with dredged material management within the pool. The construction of the proposed island would provide a beneficial use of dredged material within Pool 2, thus reducing some of the negative effects associated with dredged material management.

Water Quality – The proposed project's temporary, minor, adverse impacts on water quality would be attributed to the construction of the island. Construction action would increase turbidity through the re-distribution of sediments into the water column. This minor impact would cease once material is fully placed for the island and the features associated with it (e.g., rock groins, emergent wetland habitat). Once completed, the island would decrease wind-driven turbidity in the pool by providing a wind break and reducing the wind fetch in the Project Area. This would result in a permanent improvement in water quality. The potential water quality impact from the other projects mentioned in Pool 2 would not be close enough to the proposed island Project Area to cause a cumulative effect.

Habitat – Construction of the proposed island would result in a conversion of 16 acres of low-quality impounded open water habitat within the area of the project to emergent wetland and upland terrestrial habitat. The submerged sides of the island would also introduce spatial and sediment heterogeneity into the current aquatic habitat. These habitat changes would result in permanent beneficial effects on aquatic and terrestrial organisms, including mussels, wetland organisms, and migratory waterfowl. Impacts on aquatic habitat linked to the other analyzed projects, if any, are expected to be minor. The Pool 2 CMS and DMMP has the potential to have a minor positive impact on terrestrial habitat depending upon final placement (i.e., Pigs Eye Lake).

Visual Effects – The proposed island would have a temporary minor adverse effect on aesthetics during construction due to construction equipment and activity and unfinished work, which may be unsightly to local residents. This minor effect would cease once the island is finished and the seeding plan is implemented. Similar equipment would be used in the Pool 2 DMMP and CMS; however, these projects are far enough apart to not result in a compounding effect. Once the island is constructed, its presence is expected to have a permanent beneficial effect on local aesthetics.

Noise – Noise levels would increase during the construction of the proposed island, specifically affecting homes nearest the construction area. Construction equipment from other projects in Pool 2 would not be close enough to each other or close enough to any identified noise receptors to form a cumulatively greater noise impact. These impacts would cease once construction is finished.

Air Quality – Construction of the proposed island would result in minor adverse impacts to air quality and an increase in greenhouse gas production due to the use of construction equipment. This effect would be temporary in nature and air quality would return to normal conditions once construction is over.

Recreation- Construction of the island would have a temporary minor adverse effect on these activities, which would cease upon completion of construction activities. Presence of the island would have a permanent

beneficial effect on aquatic recreation in the area. Its presence would enhance the quality of hunting, fishing, canoeing/kayaking, and birdwatching in the area.

Commercial Navigation – The proposed protective island, in combination with the Pool 2 CMS and DMMP would have a combined beneficial effect on commercial navigation within Pool 2 by providing a use for dredged material.

20. Other potential environmental effects:

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

N/A

RGU Certification

*(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

This is a table below and to be filled out by the RGU

	10/05/20
Signature	**Date**

Title: Land Use Hydrologist/Environmental Review Unit