DRAFT ENVIRONMENTAL ASSESSMENT

Lock and Dam No. 7 – Outdraft Modification
Upper Mississippi River
La Crescent, MN
NEPA ID: EAXX-202-00-B6P-1738766760

US Army Corps of Engineers
St. Paul District

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Table of Contents

Table of Contents

CHAPTER 1. Introduction

1.1 Background

The U. S. Army Corps of Engineers (Corps) has been operating and maintaining the Upper Mississippi River for navigation since 1824. As population and agricultural production increased in the late 1800's it was determined that a navigation channel was needed to allow for the movement of shipping traffic. A series of wingdams and closing dams were established as part of the 4 ½-foot and 6-foot channel in 1878 and 1907 respectively. In the 1930 Rivers and Harbors Act, Congress authorized the 9-foot navigation channel project that would allow shipping transportation to better compete with railroads. To achieve this larger navigation channel Congress approved a lock and dam system to be built to create reservoirs or pools. The initial 26 locks and dams of the Upper Mississippi River were completed by 1940 with three more facilities added by 1964.

Today, in addition to operating the upper most 12 locks and dams, the St. Paul District of the Corps maintains the 9-foot navigation channel by removing excess material through periodic dredging and the installation of wingdams or weirs where necessary to manage flows and control the sediment load in the river. The St. Paul District continually monitors the use of the navigation channel and constantly evaluates channel conditions to ensure continued safe navigation.

Lock and Dam 7 (LD7) was constructed and placed in operation in 1935 at river mile 702.5 near La Crescent, MN. The dam structure is 940 feet long and has five roller gates and 11 tainter gates. Beginning in 1989 and lasting through 2002, major renovations of the facility were completed to replace much of the operating equipment and to construct a new control building.

A routine evaluation in 2017 at LD7 revealed unusually high outdraft conditions immediately upstream of the lock chamber. Further investigation revealed that the flow patterns of the Mississippi River had changed, creating these unsafe outdraft conditions. Under these conditions, river currents pulled navigation traffic away from the lock and toward the gated portion of the dam as vessels attempt to approach the upstream end of the lock chamber. Conditions degraded to the point that the commercial navigation industry stationed a helper tugboat along the outside portion of the lock chamber guide wall to assist barges into the lock chamber.

To address this outdraft issue, the Corps constructed a 780-foot rock weir using R270 riprap extending from the end of the guard wall upstream at a bearing of 23°15'39" W. The top of the weir was 7ft below the lower control pool (LCP-7) elevation of 638.45 feet. Construction of the initial 520 foot weir was completed 2018 and an additional 260 foot section was added in 2020. The weir was not expected to eliminate the outdraft completely but was intended to reduce the outdraft's impact on navigation by reducing velocities throughout the approach.

In 2022, the outdraft was still a serious issue and the St. Paul District planned a more thorough evaluation of the conditions. The previous outdraft study was expanded on by adding sediment modeling capabilities to the hydraulic model and it was planned to move forward with a ship

simulation of potential structural, long-term alternatives, starting in 2023. This plan was shared with the navigation industry at the Mississippi Manager's Meeting (MMM) in February 2023. Feedback from the navigation industry at the MMM indicated the outdraft was not just an issue but was progressively getting worse and the upper approach to LD7 was now the most difficult approach along the entire Mississippi River. Furthermore, the existing weir poses a significant safety risk to ship traffic such as in April 2023 when the M/V Tom Behringer ran aground on the rock weir while leaving the lock headed northbound. Following this feedback and the stranding incidents, the proposed study path forward was expedited and potential short-term options (weir modifications, alternate rock structures, dredging, etc.) were added on to the scope.

1.2 Project Area

Lock and Dam 7 is located at Mississippi River 702.5 near La Crescent, Minnesota. The project area is located directly upstream from the auxiliary lock wall along the eastern portion of the lock chamber (Figure 1).

Figure 1: Project Area

1.3 Definition of Key Terms

Upper Mississippi River – The portion of the Mississippi River from its headwaters at Lake Itasca, MN to its approximate mid-way point where near Cairo, Illinois.

Navigation Channel – The portion of the Upper Mississippi River that is maintained at a minimum depth (usually 9 feet) to allow the transport of goods via large commercial water-going vessels.

Outdraft – A term used to describe an outward current, often specifically a river current pulling toward a downstream dam.

Lock Chamber – enclosure consisting of a section of canal that can be closed to control the water level; used to raise or lower vessels that pass through it.

Auxiliary Lock Chamber – a secondary lock chamber for use in the event that the main lock chamber is not functioning properly and is not useable.

Guidewall – A wall usually made of concrete that assists or "guides" vessels into a specific area or zone, such as a lock chamber.

1.4 Purpose and Need

The purpose of the Proposed Action is to further reduce outdraft velocities at the upstream end of the LD7 lock chamber and to clear the sediment that has accumulated outside of the auxiliary chamber as a result of the existing weir to allow for crane access needed in order to repair the miter gates. The proposed work is necessary to ensure safe passage of commercial navigation vessels through the LD7 lock, to prevent damage to the lock and dam facility from runaway vessels caught in the outdraft, and to ensure continued integrity of the Upper Mississippi River 9-foot channel navigation system.

1.5 Authority

The Corps of Engineers is responsible for maintaining a navigable channel on the Mississippi River. Authority for continued operation and maintenance of the Upper Mississippi River 9-Foot Channel Navigation Project is provided in the Rivers and Harbors Acts of 1930 and 1932. Original authority for the Corps of Engineers to work on the Mississippi River was provided in the Rivers and Harbors Act of 1878. The project proposed here is authorized by the referenced legislation, and its purpose is compatible with the annual Operations and Maintenance appropriation.

CHAPTER 2. Alternatives

2.1 No Action Alternative – Existing Hazardous Outdraft Conditions

The No Action alternative is included to provide a baseline with which to compare other alternatives. In this case, the No Action Alternative includes the continued use of the navigation channel in Pool 7 under current outdraft conditions that are often less than optimally safe for routine navigation. Under this alternative, vessels traveling from Pool 7 to Pool 8 would continue to face dangerous outdraft velocity conditions leading to an increased risk of drifting off course and colliding with the lock chamber, lock gates, guide walls, or dam structure; and posing a continued threat to the safety of passengers aboard the vessel and the integrity of the lock and dam system. The No Action Alternative would also result in not dredging the material away from the auxiliary lock chamber that is necessary for the crane to access the site for the replacement of the miter gates. Due to the size of the gates, the crane is necessary for the work and under the No Action Alternative the existing deteriorating gates would remain.

2.2 Proposed Action – Single Dog-leg Weir Installation

The Proposed Action involves the modification of the existing weir structure from a straight line to a dog-leg shaped structure. The total length of this structure would be approximately 725ft. Approximately 325 ft of the downstream portion of the existing structure would remain in place and become part of the new structure and the remaining approximately 400 ft will be newly placed rock. The top elevation of the weir would be LCP+1 and would be visible most days of the year; it is anticipated that the structure will be submerged eight or fewer days per year. The width of the top of the weir would be five feet. The side slopes for the top three feet of the weir would be 4H:1V to better withstand ice with the remainder of the structure at a 3H:1V slope.

Additionally, three notches would be added to the downstream end of the weir. This is within the section of the existing weir that will remain in place and become part of the new structure. The top-of-rock elevation at the bottom of these notches would be LCP-12. These notches will provide a lower path for sand to move towards the gates and therefore should reduce the amount of sand depositing at/near the lock miter gates. The rock that is removed from the notched areas as well as from the previous structure that is outside of the new footprint will be reused in other portions of the weir construction.

Scour is expected to occur at the upstream end of the weir. To help minimize this, a launchable rock feature would be included at the very tip of the upstream portion of the weir. Additionally, a 24” rock blanket would be added immediately downstream of this launchable rock feature. A 48” rock blanket would be added to the sections of the weir in between the notches to help prevent scour from occurring.

Construction of the weir would involve the delivery of MNDOT Class V rock via haul trucks to the LD7 loading dock downstream of the lock chamber, transfer of the rock from the trucks to barges, transport of the rock through the lock chamber to the upstream approach area, and deposition of the rock from the transport vessels at the appropriate location. Staging of material and equipment would occur at the parking lot adjacent to the loading dock.

Dredging is anticipated to occur as a part of the Proposed Action both for access to the site and within the project footprint. Access dredging is needed at the loading platform area below the lock and dam structure. This material will be taken to an approved Corps dredged material placement site located below the dam such as Isle La Plume at river mile 696.1 or at Above Brownsville at river mile 690.41. The exact location will depend on dredging needs for other projects and site capacity. Material removed from the project footprint area upstream of the dam would be taken to Dakota Island dredged material placement site at river mile 706.5

Construction is anticipated to last one season, from approximately July 15 through early December 2025. During this same time period, routine maintenance and repair work of the lock miter gates will be occurring. Because of the increase in sedimentation that has resulted from the outdraft condition and the existing weir, dredging will need to occur outside of the auxiliary lock chamber prior to the placement of the crane needed to complete the work. The effects of this dredging will be covered under this Environmental Assessment.

Figure 2: Project Overview

2.3 Alternatives Evaluated

A series of alternatives, both “short-term” fixes that rapidly address the situation and “long-term” options that are more resilient, were considered. These alternatives included rock weir modifications to further reduce the outdraft flow conditions and the introduction of guard and guide walls to assist tows with navigating the upper approach to LD7. A listing and brief description of each alternative is included in Table 1 below.

Table 1: Alternatives Evaluated

	Alternative ID	Features	Description
	1	No Action	No changes will be made to the existing structures.
"Short-term" Alternatives	2	6-Notch Weir	Add rock along the existing alignment to a top elevation of +1 ft LCP with six lower “notches” that would allow for sediment transport through the weir while still reducing current velocities
	3A	Dog-leg and Parallel Weir	Modify the existing weir into a “Dogleg” shaped weir with top elevation at +1 ft LCP and three “notches” along the downstream potion of this weir along with a shorter offset parallel weir to provide a gradual redirection of flow to mitigate outdraft effects. Add an additional secondary parallel weir to the east of the dog-leg weir.
	3B (Proposed Alternative)	Dog-leg Weir	Modify the existing weir into a “Dogleg” shaped weir with top elevation at +1 ft LCP and three “notches” along the downstream potion of this weir along with a shorter offset parallel weir to provide a gradual redirection of flow to mitigate outdraft effects.
	4	3 Parallel Weir	Construct 3 parallel weirs at +1 ft LCP along the upper approach to mitigate the outdraft velocities while also allowing for sediment transport through the structures.
	5	"No Weir" (Removal to 12ft D/S, to grade U/S	Remove weir. Lower area upstream of where the weir was to match the surrounding conditions. Downstream of the weir will be at LCP-12
"Long-term “ Alternatives	6	Extended Guidewall + Notched Existing Weir	Combine the notched 6-notch weir alternative with a 600’ concrete extension to the guidewall upstream on the landside of the lock structure.
	7	Extended Guidewall + Dog-Leg Weir	Combine the dogleg weir alternative with a 600’ concrete extension to the guidewall on the landside of the lock structure
	8	Extended Guidewall + 3-Parallel Weir	Combine the 3-parallel weir alternative with a 600’ concrete extended guide wall on the landside of the lock structure.
	9	Guard Wall	Extend the upstream concrete guard wall ~750'. The upper ~400' will be angled at 16.6 degrees.

In order to understand the effects the various alternatives would have on the outdraft condition and maneuverability of navigation vessels, a series of ship simulation studies were conducted.. These evaluations consisted of a computer simulator with river flows at 65,000 CFS and 93,000 CFS along with the various weir and wall alternatives. Six commercial navigation pilots then used the simulator to navigate a vessel with a full 15 barge array through the lock chamber to determine if the outdraft conditions were improved and identify any potential problems with maneuverability around the new structure. For the 65,000 CFS flow, a helper tow was included in the model to evaluate the benefit of having an additional navigation aid.

These evaluations were conducted at the US Army Engineer Research and Development Center (ERDC) Watercraft and Ship Simulator (WaSS). Validation of the accuracy of the simulator occurred on January 16 - 26, 2024 and was followed by a second round of validation exercises on February 1-2, 2024 after adjustments were made to the initial simulator. The initial simulation testing occurred April 2 - 5, 2024 with additional testing occurring December 12-13, 2024. Table 2 below shows the various ship simulations that were evaluated along with each flow conditions.

Table 2: Ship Simulation Scenarios

ID Number	Alternative	Tow Configuration: Robin B. Ingram, Fully-Loaded	Flow		
			65,000 cfs with helper tow	65,000 cfs	93,000 cfs
1	Existing Condition (Model Validation)	Northbound			
		Southbound	x	x	x
2	6-Notch Weir	Northbound		x	
		Southbound	x	x	
3A	Dog-leg and Parallel Weir	Northbound		x	x
		Southbound	x	x	x
3B	3B (Proposed Alternative)	Northbound		x	x
		Southbound	x	x	x
4	3-Parallel Weir	Northbound		x	x
		Southbound	x	x	
5	No Weir (“Removal to -12ft D/S, to-grade U/S)	Northbound		x	x
		Southbound	x	x	
6		Northbound		x	

	Extended Guide Wall + Notched Weir	Southbound	x	x	
7	Extended Guide Wall + Dog-Leg Weir	Northbound		x	
		Southbound	x	x	
8	Extended Guide Wall + 3-Parallel Weir	Northbound		x	
		Southbound	x	x	
9	Guard Wall	Northbound		x	
		Southbound	x	x	
Total Simulations:			31		

2.3.1 "SHORT-TERM" ALTERNATIVE EVALUATION RESULTS

6-notch weir

The raising of the existing weir structure to LCP+1 and adding notches to promote sediment flow through the weir did reduce the outdraft compared to existing conditions. However, it did not reduce the effects to the point where pilots felt that an assist boat would no longer be required for transits. Certain runs indicated an increase in outdraft, but these outliers may have been caused by the increased flow through the notched areas of the weir that could produce a pronounced effect on a transiting vessel.

Dog-leg and Parallel Weir

The dog-leg and parallel weir reduced the outdraft effects compared to existing conditions. Pilots were able to successfully navigate into the lock chamber without significant difficulties. This alternative shifted the majority of the outdraft effects farther north above the lock structure. Once pilots made it through the initial draw of the flow it became much more consistent and predictable for pilots to navigate down to the long wall and into the lock chamber. Additionally, this alternative allowed for additional maneuvering room compared to other alternatives while still reducing the effects of the outdraft . The results of this alternative were similar to that of the dog-leg only weir option however the cost was significantly more. Because the dog-leg only weir option adequately addressed the outdraft conditions for a lower cost, it was selected as the Proposed Alternative and this option was eliminated.

Dog-leg Only Weir (Proposed Alternative)

The dog-leg only weir reduced the outdraft effects compared to existing conditions. Pilots were able to successfully navigate into the lock chamber without significant difficulties. This alternative shifted the majority of the outdraft effects farther north above the lock structure. Once pilots made it through the initial draw of the flow it became much more consistent and predictable for pilots to navigate down to the long wall and into the lock chamber. Additionally, this alternative allowed for additional maneuvering room compared to other alternatives while

still reducing the effects of the outdraft. The results of this alternative were similar to that of the dog-leg and parallel weir option however the cost was significantly less. Because of this, it was selected as the Proposed Alternative and the dog-leg and parallel weir option was eliminated.
3-parallel Weir

The introduction of three parallel weirs was the most effective alternative for reducing the outdraft effects seen at LD7. Similar to the Dog-leg weir alternative, the outdraft was shifted upstream of the lock structure near where the first of the weirs was located. This caused the tows to be impacted by the outdraft effects much earlier than expected compared to other alternatives. As a result, they often had to reposition their tows to make it into the lock chamber due to being out of shape. Once pilots navigated past this area, they had a much easier time keeping the tow lined up along the long wall as they entered the lock chamber. While this alternative reduced the outdraft near the lock, the positioning of the weirs does significantly reduce the amount of maneuvering room for both the transiting tow and the assist boat stationed at LD7. This poses safety concerns as there is nowhere for the assist boat to go in the event of an emergency.

No Weir

This alternative allowed for additional maneuvering room for both the assist boat and transiting tow as they no longer had the risk of running aground on the weir structure. However, the removal of the weir increased the outdraft by a large margin compared to existing conditions. While the removal of the weir allows for additional maneuvering room, it also removes the ability to catch a tow if it loses control due to the increased outdraft. In this event, the barges would most likely drift into the dam itself and could result in additional risk of damage to the gates and superstructure as well as an increase to the risk of life to the crew of each vessel.

2.3.2 "LONG TERM" ALTERNATIVE EVALUATION RESULTS

Extended Guide Walls
These alternatives introduced an extension of the guide wall in conjunction with several of the previously tested weir alternatives. This design was introduced to allow for easier maneuvering for both the tows and assist boat. It could allow for tows to catch lines much earlier in the transit as well as allow for the assist boat to have additional time to hold the head of the tow steady while pilots maneuvered their stern to properly enter the lock chamber. However, simulated transits showed that combining the guide wall extension with other outdraft reduction weir alternatives adversely affected navigation efforts as pilots were unable to keep their tows on the guide wall as they approached the lock chamber. The wall extension prevented pilots from repositioning their tows as they could no longer reverse and flank to recover from drifting towards the dam due to the outdraft. Additionally, these alternatives restricted northbound transits to the east side of the navigation channel due to the wall extension. This condition caused tows to be much more susceptible to the outdraft's effects.

Guard Wall

The introduction of a guard wall effectively eliminated the need for an assist boat at LD7 as it allowed tows to land on the river wall on the east side of the navigation channel prior to entering the lock chamber. This alternative used the effects of the outdraft to hold the tows against the guard wall and guided them down to the lock chamber throughout their approach. Simulated transits show that there is still an outdraft present above the start of the guard wall. However,

once pilots navigate into the confines of the guard wall and existing guide wall, they had no difficulty in safely entering or exiting the lock chamber. Ultimately this alternative provided the largest reduction in outdraft conditions however the cost and time needed to construct the guard wall is well beyond current budget and timing considerations therefore this alternative was eliminated.

CHAPTER 3. Affected Environmental and Environmental Consequences

The Project Area is within the lower end of Pool 7, directly upstream of the lock and dam facility, near the towns of La Crescent, MN and La Crosse, WI. The Project Area is close to the state line; loading of the material and staging of construction equipment would occur in Minnesota and the placement of rock for the weir structure is entirely in Wisconsin. Most of the habitat in the project area has been disturbed by past and present activities. Construction of the Proposed Alternative would occur in a single construction season, potentially beginning in July and extending through the end of navigation season, typically early December.

3.1.1 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) is required by the Clean Air Act to establish air quality standards that primarily protect human health. These National Ambient Air Quality Standards (NAAQS) regulate six major air contaminants across the United States. When an area meets criteria for each of the six contaminants, it is called an "attainment area" for that contaminant. Areas that do not meet the criteria are called "nonattainment areas." The project area falls in both La Crosse County, Wisconsin and Winona County, MN and neither are classified as an attainment area for each of the six contaminants and therefore, is not considered a region of impaired ambient air quality (U.S. Environmental Protection Agency, 2023).

No Action Alternative- Under the No Action Alternative there would be no long-term impacts to air quality.

Proposed Alternative- The Proposed Alternative would have a minor temporary adverse effect on local air quality in and around the project site during the construction period. Equipment used during construction is anticipated to include one or more skid steers, excavators, front-end loaders, tugboats, and a tender boat. To minimize air emissions from this equipment, contractors would be required to meet or exceed all federal, state, and local air resource requirements. Any minor temporary, localized effects to air quality would dissipate quickly and not substantially contribute to or exacerbate any serious air quality issues in the region. Therefore, any adverse effects on air quality during construction activities are expected to be temporary and negligible.

3.1.2 SURFACE WATER QUALITY

Pool 7 of the Mississippi River has generally good water quality. From 1987 to 1992 Mead (1995) found water quality to be generally better in this reach of the river than above Lake Pepin or reaches further downstream where tributaries that originate in agricultural lands drain into the Mississippi River. With the exception of isolated sloughs and backwater lakes, the dissolved oxygen content of the water remains high year-round and above levels required to sustain a quality fishery. Because of its turbulent nature, the river is well aerated, and it can assimilate a considerable biochemical oxygen demand (BOD) loading. Fertility levels (nitrogen, phosphorus, potassium, calcium, etc.) are ample to support a wide variety of aquatic plant life.

No Action Alternative- With the No Action Alternative there is a greater chance that vessels passing through the lock may collide with the lock chamber, lock chamber wall, or the dam structure than if the outdraft issues were addressed. If such a collision occurs, there is a potential that damage to the vessel may occur, and toxic chemicals would be introduced into the water column. Under existing conditions there is a much higher potential of causing harm to water quality than would be experienced by the minor temporary impacts of constructing the proposed rock weir.

Proposed Alternative- The Proposed Alternative would cause a minor and temporary effect on water quality during construction due to increased turbidity from the removal of existing rock and the placement of rock in the new footprint. Additionally, there would be a temporary increase in turbidity during dredging both for access to the loading platform and near the auxiliary lock for access during the miter gate repair. Turbidity levels would return to normal once construction was complete.

3.1.3 AQUATIC HABITAT

The project area consists primarily of main channel habitat type as classified by Wilcox (1993). This habitat type specifically relates to the main navigation channel where the majority of the river flow and discharge is observed. Main channel and main channel border habitats such as those that exist in the project area typically provide swift current, deep water, and coarse sand, gravel, or rock bottom. In the case of the project area, the main channel habitat primarily consists of sand. This part of the river system is very dynamic, exhibiting widely varying flow patterns in response to the annual precipitation cycle and discrete precipitation events. These changing patterns have a direct effect on bottom composition in the channel and can result in the loss of existing substrate material or deposition of new material. As a result, rooted vegetation and benthic invertebrates frequently do not exist or persist in the main channel, but vertebrates such as some current-tolerant fishes may utilize main channel habitat areas more frequently.

No Action Alternative- Under the No Action Alternative there would be no impacts to aquatic habitat.

Proposed Alternative- The Proposed Alternative would have some changes to aquatic habitat however the overall impacts would be negligible. The footprint of the weir structure is only changing slightly from that of the existing weir. The overall length would remain similar however the shape of the weir would be modified from a straight line to a dog-leg shape. This would not result in the net loss of aquatic habitat. In addition to the proposed change in shape of the weir, two areas of rock blanket for scour protection and a launchable rock feature will be included. This would result in a conversion of habitat type from a relatively flat, sandy river bottom consisting to that of a rockier habitat consisting of primarily of large boulders. While the change in habitat type would likely affect aquatic organisms that prefer a sandy flat shoaling substrate, it would provide habitat opportunities for species that prefer rockier substrates. Sandy habitat is common throughout that portion of the river therefore species that prefer that habitat type will have ample other areas to utilize. Some dredging is needed in order to access the loading platform below the lock facility and outside of the auxiliary lock in order to provide access for equipment needed for the miter gate replacement. Both of these areas are low quality aquatic habitat and would remain so after the dredging. Consequently, overall effects on aquatic habitat are expected to be neutral.

3.1.4 FISH AND WILDLIFE

3.1.4.1 Fish

Ninety species of fish are reported to occur in Pool 7 (Steuck et al. 2010). Of those, 29 species of fish were collected routinely (listed as common-abundant in the 2010 report), and the remainder are either occasionally or uncommonly collected or have not been collected in samples for more than a decade. Table 4 below identifies the species commonly found in Pool 7.

Table 4: Species Occurrence for Common – Abundant Fishes in Pool 7, UMR

Common Name	Scientific Name	Species Distribution
Longnose gar	*Lepisosteus osseus*	Common
Shortnose gar	*Lepisosteus platostomus*	Common
Bowfin	*Amia calva*	Common
Mooneye	*Hiodon tergisus*	Common
Gizzard shad	*Dorosoma cepedianum*	Abundant
Spotfin shiner	*Cyprinella spiloptera*	Abundant
Common carp	*Cyprinus carpio*	Abundant
Emerald shiner	*Notropis atherinoides*	Abundant
River shiner	*Notropis blennius*	Common
Spottail shiner	*Notropis hudsonius*	Common
Bullhead minnow	*Pimephales vigilax*	Abundant
Quillback	*Carpiodes cyprinus*	Common
Smallmouth buffalo	*Ictiobus bubalus*	Common
Silver redhorse	*Moxostoma anisurum*	Common
Shorthead redhorse	*Moxostoma macrolepidotum*	Common
Channel catfish	*Ictalurus punctatus*	Common
Flathead catfish	*Pylodictis olivaris*	Common
Northern pike	*Esox lucius*	Common
Brook silverside	*Labidesthes sicculus*	Common
White bass	*Morone chrysops*	Abundant
Rock bass	*Ambloplites rupestris*	Common
Pumpkinseed	*Lepomis gibbosus*	Common
Bluegill	*Lepomis macrochirus*	Abundant
Smallmouth bass	*Micropterus punctulatus*	Common
Largemouth bass	*Micropterus salmoides*	Common
Black crappie	*Pomoxis nigromaculatus*	Common
Yellow perch	*Perca flavescens*	Common
Logperch	*Percina caprodes*	Common
Sauger	*Sander Canadensis*	Common
Walleye	*Sander vitreus*	Common
Freshwater drum	*Aplodinotus grunniens*	Abundant

No Action Alternative- Under the No Action Alternative there would be no impacts to fish.

Proposed Alternative- The Proposed Alternative would have some impacts to fish however the overall impacts would be negligible. Fish that utilize this area will temporarily leave the area

during active construction and dredging, but should return upon completion. Following construction, some species of fish would use the rip rap as new rock habitat. Construction activities will occur outside of the fish spawning period of May through the end of June. Overall, impacts to fish biological productivity in the project area would have a minimal temporary impact as a result of the Proposed Alternative. Productivity would be expected to return to preconstruction levels shortly after the completion of construction activities.

3.1.4.2 Freshwater Mussels

Pool 7 supports 30 known species of native freshwater mussels (Davis 2008). Freshwater mussels are important food items for some mammals like raccoon and muskrat, as well as for some species of fish like freshwater drum. They also play a role in maintaining water quality by filtering contaminants and feeding on algae and other small floating particles. Historically, as many as 37 species have occurred in Pool 7. Since 1980, no live specimens have been collected for 6 of those 37 species; and 23 species are listed as rare, localized or near extirpation. This includes the Higgins eye pearlymussel (*Lampsilis Higginsii*), which is federally listed as endangered. Today, only eight species are commonly or abundantly found in Pool 7. See Table 5 below for a complete listing.

For mussel species, the main channel is generally a poor location to live because of constantly shifting substrates and the potential to be covered by sedimentation. Consequently, freshwater mussels infrequently occur in the main channel, and the likelihood of a mussel community developing in the proposed project area (directly upstream of the lock chamber) is very small.

The Corps conducted exploratory mussel surveys on September 11 and 12, 2023 to verify the presence or absence of freshwater mussels. Using USACE divers, a series of 33 timed dives throughout the project footprint were conducted. During these searches a total of five live individuals were collected, two fragile papershell (*Potamilus fragilis*) and one each of pink heelsplitter (*Potamilus alatus)*, hickorynut (*Obovaria olivaria*), and plain pocketbook (*Lampsilis cardium*). None of these are included in any state or federal lists as endangered, threatened, or species of special concern.

In addition to the footprint of the project, access dredging below the lock chamber is needed. Mussel surveys were conducted on June 4, 2024 using a skimmer dredge. A total of six transects were completed and 35 mussels were found including 22 Wabash pigtoe (*Amblema plicata)*, four threehorn wartyback (*Obliquaria reflexa)*, three giant floaters (*Pyganodon grandis)*, two fat mucket (*Lampsilis siliquoidea)*, two pink heel splitter (*Potamilus alatus)*, one threeridge (*Fusconaia flava)*, and one plain pocketbook (*Lampsilis cardium)*. None of these are included in any state or federal lists as endangered, threatened, or species of special concern. Figure 3 below shows the survey locations.

Table 5: Species Occurrence of Freshwater Mussels in Pool 7, UMR

Scientific Name	Common Name	Status
Amblemini		
Amblema plicata	threeridge	**A**
Anodontini		
Alasmidonta marginata	elktoe	**H**
Arcidens confragosus	rock pocketbook	**R**
Lasmigona complanata	white heelsplitter	**R**
Lasmigona costata	fluted shell	**H**
Pyganodon grandis	giant floater	**R**
Strophitus undulatus	strange floater	**R**
Utterbackia imbecillis	paper pondshell	**R**
Utterbackiana suborbiculata	flat floater	**H**

Lampsilini		
Actinonaias ligamentina	mucket	**R**
Ellipsaria lineolata	butterfly	**R**
Lampsilis cardium	plain pocketbook	**C**
Lampsilis higginsii	**Higgins eye**	**R**
Lampsilis siliquoidea	fatmucket	**R**
Lampsilis teres	yellow sandshell	**R**
Ligumia recta	black sandshell	**R**
Obliquaria reflexa	threehorn wartyback	**A**
Obovaria olivaria	hickorynut	**A**
Potamilus alatus	pink heelsplitter	**C**
Potamilus fragilis	fragile papershell	**R**
Potamilus ohiensis	pink papershell	**R**
Toxolasma parvum	lilliput	**R**
Truncilla donaciformis	fawnsfoot	**R**
Truncilla truncata	deertoe	**C**

Scientific Name	Common Name	Status
Pleurobemini		
Elliptio crassidens	elephant ear	**H**
Euryinia dilatata	spike	**H**
Fusconaia flava	Wabash pigtoe	**C**
Plethobasus cyphyus	**sheepnose**	**R**
Pleurobema sintoxia	round pigtoe	**R**
Reginaia ebena	ebonyshell	**H**

Quadrulini		
Cyclonaias nodulata	wartyback	**R**
Cyclonaias pustulosa	pimpleback	**C**
Cyclonaias tuberculata	purple wartyback	**H**
Megalonaias nervosa	washboard	**R**
Quadrula quadrula	mapleleaf	**R**
Theliderma metanevra	monkeyface	**R**
Tritogonia verrucosa	pistolgrip	**R**

Live species		**30**
Historic		**7**
Total species		**37**

H = Records of occurrence but no live collections have been documented since approximately 1980.
R = Rare, does not usually appear in sample collections, populations are small either naturally or have declined and may or may not be near extirpation.
C = Commonly taken in most samples; can make up a large portion of some samples.
A = Abundantly taken in most samples.
Federally Listed Species

No Action Alternative- Under the No Action Alternative there would be no impacts to mussels.

Proposed Alternative- Under the Proposed Alternative there would be minimal impacts to mussels. Habitat within the project footprint and in the dredging areas is poor quality and surveys found few individuals. These few individuals would be lost as a result of construction activities however the species found are common and there would be negligible impact to the species, and mussel biological productivity, overall.

Figure 3: Mussel Survey Locations

3.1.5 THREATENED AND ENDANGERED SPECIES

A search of the USFWS' Information for Planning and Conservation (IPaC) website on February 4, 2025 indicated that the northern long-eared bat (*Myotis septentrionalis;* endangered), tricolored bat (*Perimyotis subflavus*; proposed endangered), whooping crane (*Grus americana*; experimental population), Higgins eye (*Lampsilis higginsiil;* endangered), sheepnose mussel (*Plethobasus cyphyus;* endangered), eastern massasauga (*Sistrurus catenatus),* and monarch butterfly (*Danaus plexippus;* proposed threatened) could potentially be found in the action area. There is no critical habitat within the action area.

Of those listed, only the Higgins eye pearlymussel (*Lampsilis Higginsii)* and the sheepnose mussel (*Plethobasus cyphysus*) have the potential to reside within the proposed project areas. The remainder of the species listed are terrestrial and would not occur within the proposed project areas, or the proposed project areas do not contain any preferred habitat that the listed species might use. Consequently, these species were removed from further analysis due to the lack of potential for the proposed project to adversely affect them (No Effect determination for those species).

Higgins Eye
The Higgins eye (*Lampsilis Higginsii)* has the potential to reside within the proposed project area. Suitable habitat for the Higgins eye includes areas of various stable substrates in large streams and rivers (USFWS 2004). Higgins eye are most commonly associated with high-density and diverse mussel beds. Historical occurrence was once widespread and common but is currently sporadic and uncommon in the Mississippi River upstream of Pool 17. However, the species is still present in three major tributaries of the Upper Mississippi River – the Wisconsin, St. Croix and Wapsipinicon rivers (Kelner 2011). No Higgins eye were found in the mussel surveys conducted in the area.

Sheepnose Mussel
The sheepnose mussel (*Plethobasus cyphysus)* has the potential to reside within the proposed project area. Suitable habitat for the sheepnose is similar to that for the Higgins' eye (Ohio River Valley Ecosystem Team 2002). Sheepnose were historically widespread but uncommon and presently sporadic and very rare in Pool 7 of the Upper Mississippi River (Kelner, 2011). No sheepnose were found in the mussel surveys conducted in the area.

No Action Alternative- Under the No Action Alternative there would be no impacts to threatened and endangered species.

Proposed Alternative- As discussed in section 3.1.5.2 Freshwater Mussels, surveys were conducted in the project footprint and access dredging areas. No threatened and endangered species were found. Additionally, the poor habitat quality makes it unlikely that listed species would be found in the area. Therefore, under the Proposed Alternative, there would be no effect to threated and endangered species.

3.2 Socioeconomic Conditions

3.2.1 NOISE LEVELS

Noise levels in and around the vicinity of the proposed project are commensurate with that of other semi-remote midwest Mississippi River reaches along the active navigation channel. Typically, these reaches have occasional to frequent, but consistent, barge and tugboat traffic along with light to moderate public recreation traffic. Consequently, noise levels increase temporarily as commercial or recreational watercraft move through the area and subside when watercraft leave the project area. In addition, the project site is immediately above a navigation dam that has a localized, continuous higher level of noise due to the rush of water through dam gates. The project area is also immediately adjacent to Interstate 90 and associated highway traffic.

No Action Alternative- Under the No Action Alternative there would be no impacts to noise.

Proposed Alternative- Noise levels would temporarily increase under the Proposed Alternative during planned construction activities due to the use of heavy equipment to deliver and transfer rock to transport barges and, to a lesser degree, during rock deposition operations. Similarly, there would be a brief, minor increase in noise associated with noted dredging operations. These increases in noise levels are expected to be intermittent during planned activities, and overall construction activities will likley be occurring during a single construction season. Therefore, the proposed alternative would include minor intermittent, but overall temporary increases in noise levels.

3.2.2 RECREATIONAL OPPORTUNITIES

Most of the land within and around Pool 7 is part of the Upper Mississippi National Wildlife and Fish Refuge managed by the U.S. Fish and Wildlife Service (USFWS). Nearby cities of Onalaska and La Crosse in Wisconsin and La Crescent in Minnesota provide public access to the river and offer a number of high-quality recreational opportunities such as public beaches, day-use, camping, boat access, and public and private marina facilities. As a result, Pool 7 receives heavy recreational traffic throughout the year.

During the 2023 season, 4,750 recreational vessels were locked through LD7 during 1,280 lockages (USACE 2023). This is more than the 3,234 recreation vessels locked through in 2022 and 3,574 recreation vessels in 2021. (USACE 2022; USACE 2021).

No Action Alternative- Under the No Action Alternative there would be no impacts to noise.

Proposed Alternative- Under the Proposed Alternative, a minor and temporary inconvenience to recreational use would occur at the public parking lot and the fishing platform and walkway along the lock wall due to rock delivery. stockpiling and transfer activities. Access to these areas would be closed during the construction season and recreation in these areas would be lost. However, there are other opportunities for public access in the area including two public boat ramps with parking lots and areas for shore fishing.

In addition to the impacts to recreational opportunities on the shore, the increase in boat traffic through the lock as rock is moved from the loading platform to the project site will impact reaction vessels needing to lock through the facility. Contractor vessels are considered government

vessels and have the second highest priority for using the lock, behind military and emergency vessels. Recreational vessels have the lowest priority for locking through the facility. It is anticipated that the project will require several government vessel lockages a day during construction resulting in delays for recreational vessels needing to utilize the facility.

Most of the weir structure itself is within the hazard zone above the dam; therefore recreational vessels are not allowed to use this area. Additionally, the structure will be LCP+1 making it visible above the water and therefore easier for recreational vessels to avoid than the current LCP-7 structure in the areas outside of the hazard zone. The rock blankets and launchable rock structure both will provide adequate clearance for recreation users in the area. Overall, the impacts to both shore and water recreational users will be minor during the construction period. However once construction is complete, the site will be safer for users upstream of the lock as a result of the reduction in outdraft conditions.

3.2.3 PUBLIC HEALTH AND SAFETY

A search of federal, state and local records did not identify any sites of concern in or around the proposed project areas that would pose a risk to human health or public safety if intentionally or unintentionally disturbed. However, the current outdraft velocities upstream of the lock chamber pose a continuing threat to public safety because of the increased risk of vessels drifting off course and colliding with the lock chamber or guidewalls or being pulled into the dam structure. The potential safety hazard is more of a threat to commercial boat traffic than typical private recreational boats because commercial boats are typically larger and less maneuverable than recreational vessels. However, there are some larger private vessels that may also be at risk under certain channel conditions.

No Action Alternative- Under the No Action Alternative, unfavorable outdraft conditions would continue, substantially increasing the likelihood of a vessel making contact with and damaging the vessel, lock chamber or dam structure. Substantially increasing the likelihood of a crash also increases the likelihood of personal injury to vessel operators and deck hands.

Proposed Alternative- The Proposed Alternative would reduce hazardous outdraft conditions and would substantially reduce the likelihood of a serious impact with the lock chamber or dam structure and substantially reduce the existing threat to public health and safety. The proposed dredging activities also would not influence public safety, and allow the weir and miter gate construction activities to occur.

3.2.4 COMMERCIAL NAVIGATION

Commercial navigation on the Upper Mississippi River system is a large component of the country's transportation infrastructure and generates approximately $673 million annually (UMRBA 2016). Industries supported by commercial navigation in this portion of the river include agriculture, energy, mining, and manufacturing. Nearly half of the Nation's grain exports are moved by barge, and 17 million tons of cargo travel through the St. Paul District each year. The commercial navigation industry estimates an annual average savings of nearly $400 million by using the inland waterways instead of overland shipping methods (Kennedy 2021). Additionally, estimates of future production predict that demand for overwater transport will continue to increase as highways and rails become more congested.

The project area serves as a critical link between the upstream ports of Minneapolis and St. Paul, the Minnesota River, and the remaining Mississippi River navigation system downstream.

In 2024 1,549 commercial navigation lockages occurred supporting more than 8.7 million tons of commodities (USACE 2024). This was below the 10-year average of 2,188 lockages.

No Action Alternative- Under the No Action Alternative, temporary lock chamber closures may be required with little warning as a result of unacceptable outdraft velocities, causing a disruption in the commercial navigation industry both locally and regionally. These disruptions would reoccur every time a lock closure is required. Even though closures are expected to occur infrequently and be temporary, when they do occur commercial navigation would be suspended causing delays in the transportation of goods up and down the river through the Pool 7 area. Such delays would likely result in higher transportation costs that could substantially affect the commercial navigation industry both locally and regionally. Additionally, risks of potential stranding on the existing weir would continue for commercial navigation.

Proposed Alternative- The Proposed Alternative would promote continued commercial navigation, and therefore business activity, in the project area by reducing outdraft velocities at higher flow levels. This would reduce the number of days the lock chamber would be closed when river flows approach unsafe velocities. It also makes conditions safer for commercial vessels utilizing the lock facility.

3.3 Cultural Resources

Lock and Dam 7 was constructed between 1933-40 and was opened to navigation in 1937. It is one of the several navigation structures operated by the St. Paul District on the Mississippi River. The majority of the upper Mississippi River locks and dams were constructed in the 1930s authorized by the River and Harbor Act of 1930, which modified the existing 6-foot channel project to provide for the current 9-foot channel. The main components of the complex include the esplanade, the standard lock, an incomplete auxiliary lock, five submersible roller gates, nine non-submersible and two submersible Tainter gates.

Lock and Dam 7 is eligible for the National Register of Historic Places (NRHP) for its significance in the areas of economics, military, politic/government, and social history due to the relief work effort involved in the Upper Mississippi River 9 Foot Channel Navigation Project and its reflection of the Progressive and New Deal eras' efforts in the United States. It also demonstrates a significant step in the evolution of dam engineering and construction through the inclusion of the roller and Tainter gates.

While the complex is eligible for the NRHP, the Corps has determined that the proposed installation of the dogleg rock weir structures will have No Adverse Effect on Historic Properties as the modifications would be compatible with what is existing and are primarily submerged along the approach of Lock and Dam 7. Additionally, the installation of the weir will aid in the maintenance and function of the Lock and Dam.

3.4 Cumulative Effects

The Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500-1508) implementing the procedural provisions of NEPA, as amended (42 USC § 4321 et seq.) define cumulative effect as those:

"….. which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 508.1(g)(3))

Cumulative effects analysis recognizes that the most serious environmental impacts may result from the combination of individually minor effects of multiple actions over time, rather than the direct or indirect effects of a particular action (Council on Environmental Quality, 1997).

Analyzing cumulative effects requires identifying the environmentally relevant area and the past, present, and future actions in that area that would contribute incrementally to the overall effect. The environmentally relevant area is determined by both location and time. Future actions are those that are reasonably likely to occur. A future project is only considered in this analysis if there is sufficient information on the project to understand what its incremental contribution to cumulative effects might be.

The scope of this cumulative effects analysis is the area of the Mississippi River around LD7. Previous projects within this area include the construction of the original lock and dam and associated infrastructure including wingdams, an endcell, and repairs to the guide walls, construction of original rock weir in 2018, and the extension of the structure in 2020. Additional projects are anticipated to occur around the same time as construction of the LD7 weir modifications. This includes the construction of a mooring cell and dolphin structure approximately 1.5 miles upstream of the lock facility. Additionally, maintenance and replacement of the miter gates at the lock as part of routine maintenance will be occurring.

Both projects are expected to occur simultaneously with the construction of the LD7 weir modification. Having the construction occur during the same time will cause a greater impact to users of the area by having more construction equipment utilizing the space but the amount of time the area would be impacted by construction equipment would be shorter than if the projects were done consecutively.

Overall, the cumulative environmental and social effects are less than significant. All three projects would result in minor temporary impacts however these effects are small enough that, even when combined, the effects are still minor. Two of the projects, the mooring cell and dolphin structure construction and the modification of the weir, will result in minor permanent changes to aquatic habitat. This habitat that will be lost is low in quality and will not have measurable impacts to the overall aquatic habitat in lower Pool 7. Additionally, the overall benefits from these projects outweigh the minor effects of each.

Future projects are unknown at this time, however routine maintenance of the lock and dam facility will continue to occur. It is not anticipated that the mooring cell and dolphin structure and

the weir will require future maintenance. If it determined that maintenance of these structures is needed, additional environmental compliance will be completed at that time.

Table 6: Environmental Assessment Matrix

	No Action Alternative							Proposed Alternative						
	BENEFICIAL				ADVERSE			BENEFICIAL				ADVERSE		
PARAMETER	SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT	SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT
A. Social Effects														
1. Noise Levels				X								T		
2. Aesthetic Values				X							X			
3. Recreational Opportunities				X								T		
4. Transportation				X							X			
5. Public Health and Safety						X			X					
6. Community Cohesion (Sense of Unity)				X							X			
7. Community Growth and Development				X							X			
8. Business and Home Relocations				X							X			
9. Existing/Potential Land Use				X							X			
10. Controversy				X							X			
B. Economic Effects														
1. Property Values				X							X			
2. Tax Revenue				X							X			
3. Public Facilities and Services				X							X			
4. Regional Growth				X							X			
5. Employment				X							X			
6. Business Activity					X					X				
7. Farmland/Food Supply				X							X			
8. Commercial Navigation						X			X					
9. Flooding Effects				X							X			

10. Energy Needs and Resources				X							X			
C. Natural Resource Effects														
1. Air Quality				X								T		
2. Terrestrial Habitat				X							X			
3. Wetlands				X							X			
4. Aquatic Habitat				X								N		
5. Habitat Diversity and Interspersion				X							X			
6. Biological Productivity				X								T		
7. Surface Water Quality				X								T		
8. Water Supply				X							X			
9. Groundwater				X							X			
10. Soils				X							X			
11. Threatened or Endangered Species				X							X			
D. Cultural Resource Effects														
1. Historic Architectural Values				X							X			
2. Prehistoric & Historic Archeological Values				X							X			

T=Temporary Effect; N=Neutral

CHAPTER 4. Environmental Compliance

4.1 Applicable Environmental Laws and Executive Orders

4.1.1 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits anyone from taking, possessing, or transporting an eagle, or the parts, nests, or eggs of such birds without prior authorization. Disturbing an eagle to a degree that causes, or is likely to cause injury to an eagle, decrease productivity or cause nest abandonment are considered forms of take. Activities that directly or indirectly lead to take are prohibited without a permit. There are no known active eagle nests within 660 feet of the project area. If a nest is observed in the area, an exclusion zone of 660 feet will be observed.

4.1.2 Clean Water Act

The Clean Water Act (CWA; 33 USC §1251 *et seq.)* establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States and is administered by USACE. The Corps does not issue permits to itself but complies with the provisions of the Act. A Section 404(b)(1) analysis was completed for the activities associated with the weir construction

Section 401 water quality certification is required for actions that may result in a discharge of a pollutant into waters of the United States to ensure that the discharge complies with applicable water quality standards. The Wisconsin Department of Natural Resources is the agency responsible for issuing Clean Water Act Section 401 water quality certification. Section 401 water quality certification coordination is currently underway and will be completed prior to the signing of the FONSI.

4.1.3 Section 10 of the River and Harbors Act

The Mississippi River is classified as navigable waters of the United States in accordance with Section 10 of the Rivers and Harbors Act. In order to be compliant with the act, any work in, over or under navigable waters of the United States must not impede or otherwise pose a hazard to vessels using the navigation channel or it cannot be authorized. While the proposed work does include the modification of the existing and the construction of an additional rock weir structure within the Mississippi River, the structures will be located outside the main navigation channel and therefore will not impede navigation or be a hazard to vessels using the navigation channel. During construction, barges of material will need to lock through however navigation vessels will still have the right of way and any delays will be minimal. Furthermore, since the purpose of the proposed work is to reduce outdraft velocities in the upstream approach area to the LD7 lock chamber, the proposed work will improve navigation conditions in the long term. Accordingly, the proposed work is compliant with Section 10 of the Rivers and Harbors Act.

4.1.4 ENDANGERED SPECIES ACT

The Endangered Species Act (16 USC § 1531 et seq.) provides for the conservation of threatened and endangered plants and animals and the habitats in which they are found. There are seven federally listed species that are listed for the action area. The project would have no effect on threatened and endangered species as discussed in Section 3.1.6.

4.1.5 FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act requires federal agencies to consult with the U.S. Fish and Wildlife Service and the respective state fish and wildlife agencies whenever the waters or a channel of a body of water are modified by a federal agency or a federal agency with permit authority over the proposed work. This is to ensure that adequate consideration is given for the conservation, maintenance and management of wildlife resources and habitat. In compliance with the Fish and Wildlife Coordination Act, project plans are being coordinated with the USFWS, the Minnesota Department of Natural Resources, and the Wisconsin Department of Natural Resources. Furthermore, appropriate state and federal agencies will have the opportunity to review and comment on the proposed project and the findings in this Environmental Assessment.

4.1.6 NATIONAL HISTORIC PRESERVATION ACT

After considering the project's potential effects, the St. Paul District determined that proposed action would have No Adverse Effect on historic properties. In accordance with 36 CFR Part 800 the Corps consulted with both the Wisconsin and Minnesota State Historic Preservation Offices (SHPO). Concurrence was received by the WI SHPO on January 24th, 2025, and by the MN SHPO on February 3rd, 2025.

4.2 Distribution and Review of the Draft Environmental Assessment

4.2.1 PUBLIC REVIEW AND RESPONSE TO COMMENTS

This EA was made available for public review and comment from February 20, 2025 through March 22, 2025. Additionally, due to the impacts of recreation users in the area, a public meeting was held on February 27, 2025 in the city of La Crosse, WI.

References

Davis, M. (2008). Population estimates of Native Freshwater Mussels in Pool 10 of the Upper Mississippi River. Prepared for U.S. Army Corps of Engineers, St. Paul District, St. Paul, Minnesota.

Del Signore, A., Lenders H.J.R., Hendriks, A.J., Vonk, J.A., Mulder, C., and Leuven, R. S. E. W. (2014). Size-mediated effects of water-flow velocity on riverine fish species. River Research and Applications; published online in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/rra.2847.

Kelner, D. (2011). Upper Mississippi River mussel species list. U.S. Army Corps of Engineers, St. Paul District.

Kennedy, Mary; DTN Cash Grains Analyst (2021). Grain Transportation: Mississippi River Head of Navigation Opens-DTN. Retrieved from https://www.agfax.com/2021/03/23/grain-transportation-mississippi-river-head-of-navigation-opens-dtn/ on July 27, 2023.Killgore

K. Jack, Maynord, Steve T., Chan, Matthew D., Morgan II, Raymond P. (2001) Evaluation of Propeller-Induced Mortality on Early Life Stages of Selected Fish Species, North American Journal of Fisheries Management, 21:4, 947-955, DOI: 10.1577/1548-8675(2001)021<0947:EOPIMO>2.0.CO;2

Madigan T., Shirmer R.C., (2001). Geomorphological mapping and archaeological sites of the Upper Mississippi River Valley, Navigation Pools 1–10, Minneapolis, Minnesota to Guttenberg, Iowa. Hemisphere Field Services Technical Report. Principal Investigator: Clark A. Dobbs.

Mead, R. H. (1995). Contaminants in the Mississippi River, 1987–92. U.S. Geological Survey Circular 1133.

Miller, A.C., Whiting, R., Wilcox, D. B. (1989). An evaluation of a skimmer dredge for collecting freshwater mussels. Journal of Freshwater Ecology 5:151–154.

Moody, J.A., Sullivan, J.F., and Taylor, E. (2000). Effects of the flood of 1993 on the chemical characteristics of bed sediments in the Upper Mississippi River. Water, Air, and Soil Pollution 117: 329-351.

Ohio River Valley Ecosystem Team Mollusk Subgroup (ORVETMS). (2002). Status Assessment for the Sheepnose, Plethobasus cyphyus, occurring in the Mississippi River system (U.S. Fish and Wildlife Service Regions 3, 4, and 5). ORVETMS, U.S. Fish and Wildlife Service, Asheville, NC.

Steuck, M.J., S. Yess, J. Pitlo, A. Van Vooren, and J. Rasmussen. (2010). Distribution and relative abundance of Upper Mississippi River Fishes. Upper Mississippi River Conservation Committee, Onalaska, Wisconsin.

U.S. Army Corps of Engineers. (1997). Final Environmental Impact Statement for 9-Foot Navigation Channel Maintenance Management Plan, Upper Mississippi River, Head of Navigation to Guttenberg, Iowa. Record of Decision (ROD) signed 7 July 1997.

U.S. Army Corps of Engineers. (2008). Final Re-evaluation of the Recommended Plan: UMR-IWW System Navigation Study. Interim Report. Retrieved from: http://www.mvr.usace.army.mil/Portals/48/docs/Nav/NESP/NESP%20Economic%20Rev

aluation%20Interim%20Report%20-%20Final%2020080324.pdf?ver=2016-08-23-124351-107

U.S. Census Bureau. (2014). 2010–2014 American Community Survey 5-Year Estimates: Grant County, Wisconsin and Clayton County, Iowa. Retrieved from: http://factfinder.census.gov/ on January 14, 2016.

U.S. Census Bureau, Population Division. (2014). Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2014.

U.S. Environmental Protection Agency. (2015, October 1 update). Current Nonattainment Counties for All Criteria Pollutants [October 1 update]. Retrieved from: https://www3.epa.gov/airquality/greenbook/ancl.html

U.S. Fish and Wildlife Service. (2004). Higgins Eye Pearlymussel (*Lampsilis Higginsii*) Recovery Plan: First Revision. Ft. Snelling, Minnesota.

U.S. Census Bureau. (2014). 2010–2014 American Community Survey 5-Year Estimates: La Crosse County, Wisconsin. Retrieved from: http://factfinder.census.gov/ on February 22, 2018.

U.S. Census Bureau, Population Division. (2014). Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2014. Retrieved from: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk on February 22, 2018.

U.S. Environmental Protection Agency. (2015, October 1 update). Current Nonattainment Counties for All Criteria Pollutants [October 1 update]. Retrieved from: https://www3.epa.gov/airquality/greenbook/ancl.html on February 22, 2018.

Wilcox, D.B. (1993). An Aquatic Habitat Classification System for the Upper Mississippi River System. Environmental Technical Center: EMTC 93-T003. U.S. Fish and Wildlife Service, Onalaska.

Upper Mississippi River Basin Association (UMRBA). (2016) UMR Economic Profile. Retrieved from https://umrba.org/document/economic-profile-upper-mississippi-river on July 27, 2023.

U.S. Army Corps of Engineers (2024). Corps of Engineers releases 2024 Lock and Dam 7 navigation stats. Retrieved from https://www.mvp.usace.army.mil/Media/News-Releases/Article/3241400/corps-of-engineers-releases-2024-lock-and-dam-7-navigation-stats/ on February 5, 2025.

U.S. Army Corps of Engineers (2021). Corps of Engineers releases 2021 Lock and Dam 7 navigation stats. Retrieved from https://www.mvp.usace.army.mil/Media/News-Releases/Article/2893832/corps-of-engineers-releases-2021-lock-and-dam-7-navigation-stats/ on July 27, 2023.

U.S. Army Corps of Engineers (2023). Corps of Engineers releases 2023 Lock and Dam 7 navigation stats. Retrieved from https://www.mvp.usace.army.mil/Media/News-Releases/Article/3616709/corps-of-engineers-releases-2023-lock-and-dam-7-navigation-stats/ on January 10, 2024.

Attachments

ATTACHMENT A: FINDING OF NO SIGNIFICANT IMPACT

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT
332 MINNESOTA STREET, SUITE E1500
ST. PAUL, MN 55101-1323

Regional Planning and Environment Division North

FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act, the Corps of Engineers, St. Paul District (USACE), has assessed the environmental impacts of the following project:

Lock and Dam No. 7 – Outdraft Modification

Houston County, Minnesota
La Crosse County, Wisconsin
February 2025
NEPA ID: EAXX-202-00-B6P-1738766760

The purpose of the proposed action is to modify the existing weir structure at Lock and Dam 7 to reduce the dangerous outdraft conditions and to dredge the sediment that has accumulated at the auxiliary lock chamber as a result of the existing weir. The existing weir will be reconfigured from a straight line to a “dog-leg” shape with three notches added to the downstream portion. Additional scour protection will be added as well as a launchable rock feature. The EA and its attachments are incorporated in this Finding of No Significant Impact (FONSI) by reference.

This FONSI is based on the following factors: the project would have minor temporary adverse effects to recreational opportunities, noise levels, air quality, biological productivity, and surface water quality. Affected resources would be expected to recover from any adverse effects shortly after construction. The project would have no effect on federally listed species and would have no effect to historic properties. Overall, the project would have a long-term beneficial effect to the safety of users of the lock facility.

No compensatory mitigation is required as part of the project. USACE will require the measures included in 401 Water Quality Certification be followed by contractors.

Public review of the draft EA and FONSI was completed. All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, USACE determined that the project will have no effect on federally listed species or their designated critical habitat. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, USACE determined that the project would have No effect to Historic Properties. The Minnesota State Historic Preservation Office concurred on January 24, 2025, and the Wisconsin State Historic Preservation Office concurred on February 3, 2025. Pursuant to the Clean Water Act of 1972, as amended, a discharge into waters of the United States is proposed and an individual Section 404(b)(1) evaluation has been completed. Section 401 Water Quality Certification will be obtained from Wisconsin Department of Natural Resources prior to construction.

For the reasons above, the proposed action does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, an environmental impact statement will not be prepared.

_____
Date

_____
Joshua D. Rud
LTC, EN
Acting Commander

Lock and Dam No. 7 – Outdraft Modification

Appendix B - Section 404(b)(1) Evaluation

US Army Corps
of Engineers®
St. Paul District

Appendix B – Section 404(b)(1) Evaluation

Contents

1 Project Description

1.1 Location and General Description

Lock and Dam 7 is located in the central portion of the Upper Mississippi River near La Crescent, MN. The project area is located directly upstream from the auxiliary lock wall along the eastern portion of the lock chamber (see Figure 1 in the Environmental Assessment Report).

The upstream approach to the lock chamber has experienced a dangerous outdraft condition that has continued to get worse, posing a significant safety risk to vessels utilizing the facility. The Corps constructed a weir in 2018 to help address this issue however conditions have continued to deteriorate.

The purpose of the project is to further reduce the outdraft velocities at the upstream end of the LD7 lock chamber. The proposed work is necessary to ensure safe passage of commercial navigation vessels through the LD7 lock, to prevent damage to the lock and dam facility from runaway vessels caught in the outdraft, and to ensure continued integrity of the Upper Mississippi River 9-foot channel navigation system.

2 Authority and Purpose

2.1 Basic Project Purpose

The overall project purpose is to reduce dangerous outdraft conditions at LD7 and dredge the material that has built up along the auxiliary lock as a result of the conditions.

2.2 Water Dependency

The activity does not require access or proximity to or siting within a special aquatic site to fulfill its basic purpose; therefore, the activity is not water dependent.

2.3 Overall Project Purpose

The overall project purpose is to modify the existing weir to better address the outdraft conditions that pose a significant safety risk to vessels utilizing the lock facility. In addition, dredging to remove sediment that has accumulated at the auxiliary lock as a result of the weir will be completed to allow access for the replacement of the miter gates.

2.4 Authority

The Corps of Engineers is responsible for maintaining a navigable channel on the Mississippi River. Authority for continued operation and maintenance of the Upper Mississippi River 9-Foot Channel Navigation Project is provided in the Rivers and Harbors Acts of 1930 and 1932. Original authority for the Corps of Engineers to work on the Mississippi River was provided in the Rivers and Harbors Act of 1878. The project proposed here is authorized by the referenced legislation, and its purpose is compatible with the annual Operations and Maintenance appropriation.

3 Project Alternatives

Section 2 of the Environmental Assessment describes the alternatives that were initially identified to address the project objectives. After further evaluation and modeling of the alternatives, only one alternative was determined to meet the project objective.

3.1 Proposed Action

The Proposed Action involves the modification of the existing weir structure from a straight line to a dog-leg shaped structure. The total length of this structure would be approximately 725ft. Approximately 325 ft of the downstream portion of the existing structure would remain in place and become part of the new structure and the remaining approximately 400 ft will be newly placed rock. The top elevation of the weir would be LCP+1 and would be visible most days of the year; it is anticipated that the structure will be submerged eight or fewer days per year. The width of the top of the weir would be five feet. The side slopes for the top three feet of the weir would be 4H:1V to better withstand ice with the remainder of the structure at a 3H:1V slope.

Additionally, three notches would be added to the downstream end of the weir. This is within the section of the existing weir that will remain in place and become part of the new structure. The top-of-rock elevation at the bottom of these notches would be LCP-12. These notches will provide a lower path for sand to move towards the gates and therefore should reduce the amount of sand depositing at/near the lock miter gates. The rock that is removed from the notched areas as well as from the previous structure that is outside of the new footprint will be reused in other portions of the weir construction.

Scour is expected to occur at the upstream end of the weir. To help minimize this, a launchable rock feature would be included at the very tip of the upstream portion of the weir. Additionally, a 24” rock blanket would be added immediately downstream of this launchable rock feature. A 48” rock blanket would be added to the sections of the weir in between the notches to help prevent scour from occurring.

Construction of the weir would involve the delivery of MNDOT Class V rock via haul trucks to the LD7 loading dock downstream of the lock chamber, transfer of the rock from the trucks to barges, transport of the rock through the lock chamber to the upstream approach area, and deposition of the rock from the transport vessels at the appropriate location. Staging of material and equipment would occur at the parking lot adjacent to the loading dock.

Dredging is anticipated to occur as a part of the Proposed Action both for site access and within the project footprint. Access dredging is needed at the loading platform area below the lock and dam structure. This material will be taken to an approved Corps dredged material placement site located below the dam such as Isle La Plume at river mile 696.1 or at Above Brownsville at river mile 690.41. The exact location will depend on dredging needs for other projects and site capacity. Material removed from the project footprint area upstream of the dam would be taken to the approved Dakota Island dredged material placement site at river mile 706.5

Construction is anticipated to last one season, from approximately July 15 through early December 2025. During this same time period, routine maintenance and repair work of the lock miter gates will be occurring. Because of the increase in sedimentation that has resulted from the outdraft condition and the existing weir, dredging will need to occur outside of the auxiliary lock chamber prior to the placement of the crane needed to complete the work.

4 General Description of Dredged or Fill Material

4.1 General Characteristics

Final determinations for the source of material have not been made, but general characteristics of the type of fill material are listed below.

MNDOT Class V riprap material is expected to be the main type of rock used. This rock is approximately 30 inches in diameter. Additionally, rock recovered from the removal of portion of the existing structure will be reused. This rock is generally R270 riprap and is slightly larger in size than the MNDOT Class V.

4.2 Source of Material

Final determinations for the source of material have not been made but riprap would likely come from local quarries that have limestone.

4.3 Quantity of Material

The following quantities were calculated using rock similar in size to MNDOT Class V riprap.

Summary	CY	Tons
Re-used excavated material	2000	
Launch Rock	1700	2550
Rock Blanket	1800	2700
Main Weir, Scour Protection, Rock Fill, and Transition areas	20000	30000

4.4 Description of the Proposed Discharge Site

4.4.1 Location

The project is located on the Mississippi River near the town of La Crescent, MN. The fill material will be placed adjacent to the navigation channel above LD7.

4.4.2 Size

The size of the project area is approximately one acre.

4.4.3 Site and Habitat Description

This portion of the main channel of the Mississippi River is predominately coarse sand substrate. The habitat has been highly modified from historic conditions as a result of the construction of the lock and dam system and associated structures such as rock weirs and wingdams.

4.4.4 Timing and Duration

The proposed project is anticipated to be constructed in one construction season lasting from July 15 through early December 2025.

4.5 Description of Disposal Method

Rock will be loaded on to barges at the loading facility below the lock chamber directly from the trucks coming from the quarry. This material will then be locked through at LD7 before the material is placed using an excavator.

5 Factual Determinations

5.1 Physical Substrate Determinations

5.1.1 Substrate Elevation and Slope

Existing elevation within the project area is relatively flat outside of the existing weir. The existing weir has a 3H:1V slope and a bottom width ranging between 60 and 140 feet. The top of the weir is 22 feet wide and at a height of LCP-7. The new weir will be LCP+1 with a side slope of 3H:1V with the exception of the top three feet which would be at 4H:1V. Three notches will be added to the downstream portion of the weir and will have a height of LCP-12

Additionally, a 24” rock blanket would be added immediately downstream of this launchable rock feature. A 48” rock blanket would be added to the sections of the weir in between the notches to help prevent scour from occurring.

5.1.2 Sediment Type

Sediments in the project area consist of coarse sand.

5.1.3 Fill Material Movement

Fill material is not expected to move significantly once placed

5.1.4 Actions Taken to Minimize Impacts

A number of procedures would be used to minimize impacts where needed. All work performed by a contractor will be subject to adherence with a work plan and 401 Water Quality certification. The work plan shall detail the contractor’s proposed methods to perform work described by contract drawings. This plan (and other related plans) shall be submitted to Government Representative (Corps COR) for review and acceptance before any site work commences.

5.2 Water Circulation, Fluctuation and Salinity Determination

5.2.1 Water

Some minor, short-term decreases in water clarity are expected from the proposed fill actions. The project would have no effect on salinity, water chemistry, color, odor, taste, dissolved oxygen, nutrients, eutrophication or temperature.

5.2.2 Current Patterns and Circulation

5.2.2.1 Current Velocity and Patterns

The weir would alter the flow patterns causing a reduction in the outdraft current.

5.2.2.2 Stratification

The proposed project would have no effect on stratification.

5.2.2.3 Hydrologic Regime

The proposed project would have no effect on hydrologic regime.

5.2.2.4 Normal Water Level Fluctuations

The proposed project would have no effect on normal water level fluctuations.

5.2.2.5 Salinity

The proposed project would have no effect on salinity.

5.2.2.6 Actions Taken to Minimize Impacts

No special actions would be taken to minimize the effects of the proposed project on water patterns or circulation.

5.3 Suspended Particulate/Turbidity Determination

5.3.1 Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site

Increases in turbidity and suspended particulates would temporarily occur from the discharge of fill material and excavation in the immediate project vicinity; however, levels would return to pre-project conditions upon completion of construction.

5.3.2 Effects on Chemical and Physical Properties of the Water Column

Increased turbidity levels during construction would have a short-term and minor effect to light penetration in the immediate project area. The project would have no appreciable effect on dissolved oxygen or pH during or after construction.

5.3.3 Actions Taken to Minimize Impacts

The discharge of fill material and excavation would result in disturbance to the existing substrate, causing a temporary and localized increase in turbidity and suspended particulates. As part of the project's plans and specifications, the contractor will develop an environmental protection plan that will include Best Management Practices (BMPs) designed to minimize impacts of the project to the surrounding environment. All construction related debris would be managed so that no debris, garbage, or fuel enters the water.

5.4 Contaminant Determinations

The use of clean, quarry-run rock riprap for construction would not introduce contaminants into the aquatic system. Neither the materials used, nor the placement method cause relocation or increases of contaminants in the aquatic system.

5.5 Aquatic Ecosystem and Organism Determination

5.5.1 Effects on Plankton

During construction, there may be a temporary increase in turbidity and suspended solids which would locally suppress phytoplankton productivity in the project area. However, this effect would be minor and short-term. Plankton populations would quickly recover after construction.

5.5.2 Effects on Benthos

Benthos present in the areas where the river would be filled would be destroyed. Benthic organisms, particularly those that favor the use of interstitial voids would recolonize the area after construction.

5.5.3 Effects on Nekton

During construction, nekton would temporarily avoid the areas where rock would be placed; however, after construction, nekton would return.

5.5.4 Effects on Aquatic Food Web

The impacts on benthos and plankton productivity as described above could cause a short-term minor temporary impact on the local aquatic food web.

5.5.5 Effects on Special Aquatic Sites

No Special Aquatic Sites are found within the project area.

5.5.6 Threatened and Endangered Species

A search of the USFWS' Information for Planning and Conservation (IPaC) website on February 4, 2025 indicated that the northern long-eared bat (*Myotis septentrionalis*; endangered), tricolored bat (*Perimyotis subflavus*; proposed endangered), whooping crane (*Grus americana*; experimental population), Higgins eye (*Lampsilis higginsiil*; endangered), sheepnose mussel (*Plethobasus cyphyus*; endangered), eastern massasauga (*Sistrurus catenatus*), and monarch butterfly (*Danaus plexippus*; proposed threatened) could potentially be found in the action area. There is no critical habitat within the action area.

Of those listed, only the Higgins eye pearlymussel (*Lampsilis* Higginsii) and the sheepnose mussel (*Plethobasus cyphysus*) have the potential to reside within the proposed project areas. The remainder of the species listed are terrestrial and would not occur within the proposed project areas, or the proposed project areas do not contain any preferred habitat that the listed species might use. Consequently, these species were removed from further analysis due to the

lack of potential for the proposed project to adversely affect them (No Effect determination for those species). Surveys were conducted and no Higgins eye or sheepnose mussels were found. Therefore, the project is not anticipated to have effects on any threatened or endangered species.

5.5.7 Other Wildlife

The proposed project would have a minor and temporary effect in terms of avoidance of the area by wildlife during construction. Birds will likely be discouraged from nesting adjacent to the project area due to noise during construction. However, after construction is complete birds and other wildlife would return to the area. There are no bald eagle nests within the vicinity of the project area.

5.5.8 Actions Taken to Minimize Impacts

To minimize effects to fish species, no instream work would occur during spawning season (March 1 – June 15).

5.6 Proposed Disposal Site Determinations

5.6.1 Mixing Zone Determination

The placement of fill material would cause a minor, temporary increase in turbidity in the immediate vicinity; however, no long-term adverse impacts to water quality would occur from any of the proposed project features

5.6.2 Determination of Compliance with Applicable Water Quality Standards

It is not anticipated that the proposed project would violate Wisconsin water quality standards. Rock riprap would be obtained from approved pits and quarries close to the project area. The contractor will be required to prepare a Stormwater Pollution Prevention Plan (SWPPP). Water quality certification would be obtained from the Wisconsin Department of Natural Resources (WDNR) prior to project construction. Project related discharges are not expected to exceed the total suspended solids standards of 200mg/L.

5.6.3 Potential Effects on Human Use Characteristics

5.6.3.1 Municipal and Private Water Supply

The proposed project would not impact municipal or private water supplies.

5.6.3.2 Recreational and Commercial Fisheries

Recreational fishing within and immediately adjacent to the project area would be temporarily impacted during construction due to noise from construction equipment and limited or no access during construction; however, no long-term negative effects are anticipated.

5.6.3.3 Water Related Recreation

Water related recreation within and immediately adjacent to the project area would be temporarily impacted during construction due to an increase in construction equipment in the area, especially the increase in vessels utilizing the lock; however, no long-term negative effects are anticipated. The project will reduce dangerous outdraft conditions of vessels utilizing the lock therefore making water related recreation safer.

5.6.3.4 Aesthetics

The weir structure will be at LCP+1 and therefore visible except for period of extremely high water. Although the structure will be visible, the project area is immediately adjacent to the lock and dam structure and therefore would not change the overall aesthetics of the site much.

5.6.3.5 Cultural Resources

The Corps has determined that the project would have no effect to historic properties. See Section 3.3 of the Environmental Assessment.

5.7 Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed project would cause no significant adverse cumulative impacts on the aquatic ecosystem. Effects of the construction would be minimal and mostly positive by reducing the dangerous outdraft condition, therefore making the site safer for users of the area.

5.8 Determination of Secondary Effects on the Aquatic Ecosystem

No significant secondary effects on the aquatic ecosystem would be expected from the proposed action.

6 Mitigation

Although approximately 16,000CY of riprap would be placed below the OHWM of the Mississippi River, this would not result in a permanent loss of waters; therefore, no mitigation would be provided.

7 Finding of Compliance with Restrictions on Discharge

1. No significant adaptations of the guidelines were made relative to this evaluation.
2. The proposed fill activity would comply with the Section 404(b)(1) guidelines of the Clean Water Act. The placement of fill is required to provide the desired benefits.
3. There are no practical and feasible alternatives to the placement of fill in the proposed sites that would meet the objectives and goals of this project. The proposed project is the least environmentally damaging practicable alternative.
4. The proposed fill activity would comply with State water quality standards. The disposal operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

5. The proposed project would not jeopardize the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, or result in likelihood of the destruction or adverse modification of critical habitat.
6. The proposed fill activities would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, aquatic habitat, terrestrial habitat, and recreation. The life stages of aquatic life and other wildlife would not be adversely affected. Significant adverse effects on the aquatic ecosystem, and recreational, aesthetic, and economic values would not occur.
7. On the basis of this evaluation, I conclude that the proposed discharge complies with the Section 404(b)(1) Guidelines for the discharge of dredged or fill material.

_____
Date

Joshua D. Rud
LTC, EN
Acting Commander