March 2018

July 2013 version

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at: http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. 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 for.

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:** Kingsbury Bay - Grassy Point Habitat Restoration Project

2. **Proposer:** MN Department of Natural Resources
   Contact person: Melissa Sjolund
   Title: Habitat Coordinator
   Address: 525 Lake Ave S. #415
   City, State, ZIP: Duluth, MN 55802
   Phone: 218-302-3245
   Fax: n/a
   Email: melissa.sjolund@state.mn.us

3. **RGU:** MN Department of Natural Resources
   Contact person: Kate Fairman
   Title: EAW Project Manager
   Address: 500 Lafayette Road
   City, State, ZIP: St. Paul, MN 55155
   Phone: 651-259-5082
   Fax: 651-296-1811
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4. **Reason for EAW Preparation:** (check one)

Required:	Discretionary:
☐ EIS Scoping	☐ Citizen petition
X Mandatory EAW	☐ RGU discretion
☐ Proposer initiated	

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

M.R., part 4410.4300 subpart 27, item A: Wetlands and Public Waters

5. Project Location:

County: St. Louis County, Minnesota, Douglas County, Wisconsin
City/Township: Kellogg / Highland Township
PLS Location (¼, ¼, Section, Township, Range):

Project	Section	Township	Range
Kingsbury	13	49N	15W
Grassy Point	18 & 20	49N	14W

Watershed (81 major watershed scale):
Kingsbury Creek AUID: 04010201-626
Keene Creek AUID: 04010201-627
St. Louis River AUID: 04010201-501

GPS Coordinates:

Kingsbury Bay
Approximate Latitude: 46° 43’ 20” N
Approximate Longitude: 92° 9’ 8” W

Grassy Point
Approximate Latitude: 46° 43’ 33” N
Approximate Longitude: 92° 10’ 52” W

Tax Parcel Numbers: See Attachment A

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

- County map showing the general location of the project;

Figure 1. General Project Location

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and

Figure 2. Kingsbury Bay and Grassy Point 1:24,000 Topographic Map

- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

Figure 3. Project Sectors
Figure 4. Restoration Site Units (RSUs) Kingsbury Bay & Grassy Point
Figure 5. Kingsbury Bay Historical Image Comparison
Figure 6. Grassy Point Wood Waste Evaluation
Figure 7. Grassy Point Sediment Sampling Results
Figure 8A. Kingsbury Bay Concept Plan
Figure 8B. Grassy Point Concept Plan
Figure 9. Kingsbury Bay and Grassy Point Soils Data
Figure 10. Minnesota Well Index
Figure 11A. Kingsbury Bay Wetlands
Figure 11B. Grassy Point Wetlands

6. Project Description:

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

The Kingsbury Bay – Grassy Point project sites are located at the upper end of the Duluth-Superior Port, St Louis River Estuary (Figure 1). The Minnesota Department of Natural Resources proposes to mitigate latent contaminated sediments, legacy wood waste, and excessive sedimentation, thereby restoring 240 acres of fish and wildlife habitat within a part of the St Louis River Area of Concern (AOC). Detrimental materials will be removed, contained on-site, or capped in-place. Areas with excess sedimentation will be deepened and the clean materials transported and reused for capping, shallowing, or softening shorelines. Shallow sheltered bay habitats that support productive estuarine marshes of Lake Superior will be restored.

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 Minnesota Department of Natural Resources (MNDNR) proposes to restore approximately 240 acres of coastal marsh in the St. Louis River Estuary (SLRE or the estuary) at two locations in the St. Louis River Bay, Duluth, Minnesota. The restoration goal is to create shallow sheltered bay habitats that support Lake Superior estuary marsh by providing depth ranges and substrates supportive of desired benthic organisms and diverse aquatic vegetation.

Proposed construction will occur during the winter and summer-fall seasons over a two year period, targeted to begin in July 2018 and end during the winter of 2019. Primary construction activities of the Kingsbury Bay – Grassy Point Habitat Restoration Project (Project) include the following:

- Removing excess sediments from Kingsbury Bay;
- Removing or confining wood waste deposits at Grassy Point followed by replacement with suitable mixed organic and mineral substrates;
- Reconfiguring the mouth of Keene Creek;
- Softening hardened shorelines at Grassy Point and constructing littoral zones; and

- Assessing risk of exposure to latent contaminated sediments at Grassy Point.

Both Kingsbury Bay and Grassy Point construction actions are elements of the St. Louis River Restoration Initiative (SLRRI), a comprehensive program administered by the MNDNR to restore and improve management of aquatic and terrestrial habitats within the lower St. Louis River watershed. The 2013 Roadmap to Delisting officially designated the projects separately as required "actions" and established the restoration objectives that would later be developed into Concept Plans projecting the natural resource outcomes for both Kingsbury Bay and Grassy Point (Figures 8A and 8B) (City of Duluth, et al. 2015, LimnoTech 2012, Limnotech, Inc. 2014).

The Kingsbury Bay sector of the project is a major restoration component of injury compensation through the CERCLA (Superfund Law) for contamination on the SLRIDT site (includes Stryker Bay, 59th Avenue Peninsula, Slip 6, 54th Avenue Peninsula, and Keene Creek Bay), located adjacent to the XIK Dock #7 (St. Louis River Citizens Action Committee 2002).

Detailed Project Description

The Kingsbury Bay – Grassy Point Project Area is located in Duluth, Minnesota, within the Port of Duluth, Minnesota – Superior, Wisconsin. There are five project sectors, including one Kingsbury Bay sector and four Grassy Point sectors: Grassy Point - nearshore; Lower Keene Creek Channel and Wetland; potential Contaminated Sediment Locations (within Grassy Point - nearshore area); and the XIK Dock #7 (includes other potential on-site material stockpiles). Restoration Site Units (RSU) are subareas within the sectors.

Restoration Site Units (RSU)

Each project sector described below contains one or more Restoration Site Units (RSUs). RSUs represent planning areas that encompass similar objectives, material handling, construction techniques, and potential environmental impacts. The RSU areas and acreage are listed in Table 1 and mapped in Figure 4. Proposed changes to water depth and upland elevation are benchmarked to the Estuary water surface design elevation of 601.1 feet.

Table 1. Restoration Site Units (RSU) for the Kingsbury and Grassy Point Project[1].

Sector	RSU	Description	Approx. Area (Acres)
A	RSU 1	Kingsbury Bay Delta	16
B	RSU 2	Grassy Point Islands	10
B	RSU 3	Grassy Point Baymouth Bar	8
A	RSU 4	Kingsbury Bay Open Water	28
A	RSU 5	Kingsbury Bay Open Water Sand	7
B	RSU 6	Grassy Point Baymouth Bar Shallows	3
B	RSU 7	Grassy Point Area of Concern	23
B	RSU 8	Grassy Point Open Water Creation	8
B	RSU 9	Keene Creek Channel Expansion	3
D	RSU 10	Grassy Point Impacted Sediment	- [2]
D	RSU 10.1	Grassy Point Benthic Remediation	10
C	RSU 11	Upper Keene Creek Restoration	4

Sector	RSU	Description	Approx. Area (Acres)
E	RSU 12	XIK Dock 7	n/a[3]
B	RSU 13	BNSF Causeway Softening	4
TOTAL			124

[1] Represents proposed construction zone, including 51 acres of the 80 acre Kingsbury Bay site and 73 acres of the 160 ac Grassy Point site.
[2] Following a contaminated sediment risk assessment, RSU 10 was replaced with RSU 10.1. RSU 10 acres are therefore not included in the total.
[3] RSU 13 is a staging area only. No restoration construction activities will occur at XIK Dock 7.

Project Sectors

A. Kingsbury Bay Sector (RSUs 1, 4, and 5)

Kingsbury Bay is an 80-acre shallow sheltered bay approximately six miles inland from Lake Superior and one mile upstream of Grassy Point (Figure 2). The bay is surrounded by land containing the Indian Point Campground and shoreline trails owned by the City of Duluth and residential development along the north shore. Sedimentation from Kingsbury Creek watershed has converted approximately 24 acres of former open water wetland (Type 5) to a one-to-three foot deep emergent marsh (Type 3) dominated by narrow-leaved cattail, an invasive species. The shallowing has reduced the hydrodynamic effects of the Lake Superior seiche, diversity of fish habitat, and access to recreational boaters. Aerial photographs taken over a period of years show the progressive nature of the habitat degradation within Kingsbury Bay (Figure 5).

Kingsbury Bay is composed of three Restoration Site Units, including RSU 1, RSU 4 and RSU 5 (Figure 4). Shallow sheltered bay habitat will be reestablished in this sector by the removal of approximately 174,000 cubic yards (CY) of sediment. The dredge material from the bay will be transported and reused as a biological medium for placement over impaired substrates at Grassy Point. The City of Duluth is assisting on determining the most appropriate transportation route for haul trucks between Kingsbury Bay and Grassy Point. Surplus materials will be transported to the 21st and 40th Avenues West AOC Project sites. The environmental impacts associated with these activities are described in the Environmental Assessment Worksheets prepared for each project. The fine sediments are anticipated to provide the consistency and nutrient content that support a diverse mix of aquatic vegetation and macroinvertebrates and improve the biological productivity at habitat restoration sites in the estuary.

To the extent possible, excavation and transport of fine sediment materials to Grassy Point will be timed for fall or early spring to maximize recruitment via vegetative propagules. Wild rice will be planted in portions of the sector as part of the St. Louis River Estuary Wild Rice Restoration Project also supported by NRDA restoration funds (SLRIDT NRDA 2017).

Restoration Site Unit 1 – Kingsbury Bay Delta. Approximately 80,000 CY of sediment will be excavated from 16 acres of Kingsbury Creek. RSU 1 currently ranges from 0 to 2 feet deep (Figure 13A). The proposed depth following construction will average four feet (shallow marsh), with zones of gradation. A deeper 4 to 6 foot channel and an 8 foot hole is also planned (Figure 13A).

An application of fine organic material obtained from open water portions of the bay might be used to cap areas excavated in RSU 1. The layer of organic materials will be used to inoculate the bottom surface with native seeds and propagules for re-establishing aquatic vegetation.

Access to RSU 1 may use portions of the Munger Trail and the Western Waterfront Trail, pending approvals by the City of Duluth authorities.

Restoration Site Unit 4 – Kingsbury Bay Open Water. Approximately 78,000 CY of material will be excavated from a 28-acre open water portion of Kingsbury Bay. Current depths within RSU 4 primarily range from 0 to 4 feet (Figure 13A). Proposed depths will range from 0 to 6 feet, designed to be supportive of shallow marsh (Type 3) along nearshore zones that transition to open water wetlands (Type 5) in deeper areas. An eight foot deep hole approximately three acres in size is proposed to provide off-channel overwintering habitat for fish (Figure 13A). The deep hole will prevent fish kill during severe winters.

The clean sediments removed from this RSU will be reused at Grassy Point for capping dredged areas to enhance substrate qualities beneficial in reestablishing aquatic vegetation; also, some dredge material may be redistributed on Kingsbury Bay dredged areas.

RSU 4 has been designed to exclude select areas of desirable submerged aquatic vegetation. The excavation of organic and mineral sediments from Kingsbury Bay will eliminate existing aquatic vegetation within the remaining RSU area. An existing reference site indicates that aquatic vegetation can reestablish after two to three years of recovery where water depth and substrate offer suitable conditions.

Restoration Site Unit 5 – Kingsbury Bay Open Water Sand. Approximately 16,000 CY of mostly sand will be excavated from seven acres at the mouth of Kingsbury Creek. The RSU current depth ranges from 0 to 4 feet. The proposed depth will range from 2 to 6 feet, designed to be supportive of shallow marsh (Type 3) nearshore transitioning to open water wetlands (Type 5) in deeper channel areas (Figure 13A).

The sandy materials removed from Kingsbury Bay is planned to be beneficially reused within and around RSU 2 and RSU 3 at Grassy Point. Some sandy material might be applied along Indian Point on nearshore areas to enhance a beach feature planned by the City of Duluth. Some stockpiling might occur at XIK Dock #7, Kingsbury Bay, or Grassy Point to accommodate project phasing.

B. Grassy Point Sector (RSUs 2, 3, 6, 7, 8, 9, and 13)

Grassy Point is a 160-acre impaired wetland complex located in an area heavily influenced by historic industrial activities, about five miles from Lake Superior, near the upstream limits of Duluth's active harbor (Figure 3). Land in proximity to Grassy Point remains largely devoted to industrial use. The site is bounded on the north by Burlington Northern/Santa Fe (BNSF) Railroad line, on the east by the main shipping channel and on the southwest by the C. Reiss Coal Dock, an operating bulk materials handling facility.

Grassy Point was the site of two 19th century sawmilling operations that during operation dumped a total of over 500,000 CY of logs, lumber slabs, and sawdust wood waste directly into the estuary. Wood wastes became scattered across Keene Creek outlet, terrestrial habitats, and wetlands, where deposits up to 16 feet deep remain across roughly 75 acres (Figure 6) (Limnotech, Inc. 2014). This resulted in extensive damage and caused impairments to wetlands and shorelines due to altered

site hydrodynamics, and converted open water wetlands (Type 5) to shallow marsh (Type 3) dominated by invasive species. The aquatic environment prevents the decomposition of most of the wood deposits, which continue to hamper the growth and development of vegetation and benthic organisms. Abandoned industrial infrastructure--building foundations, bricks, riprap, and railroad/pier pilings--also impair the aquatic ecosystem at Grassy Point.

The MNDNR proposes to remove and/or cap layers of wood waste over approximately 50 acres. Open water wetlands approximately three to five feet deep will be created by excavating approximately 173,000 cubic yards (CY) of wood waste and wood-sediment mixes. The excavation will be followed by the placement of clean fill from Kingsbury Bay to achieve a desirable depth range and improve conditions for the development of vegetation and benthic organisms. Where the existing bathymetry does not require altering, wood wastes will be left intact and covered with approximately six inches of clean fill to improve growth potential in the area.

Upland features will be created by covering areas with the deepest wood deposits or historic pilings. An island will be built up to support upland vegetation and a portion of its eastern flank will be extended to serve as a baymouth bar. The baymouth bar will be hydrodynamically modeled for stability and function and strategically located to provide partial protection of a large area conformed to function as shallow sheltered bay habitat. The island will be planted with native forbs, shrubs, and trees. The high voltage Minnesota Power powerline and poles on Grassy Point Island will be protected during construction.

Restoration Site Unit 2 – Grassy Point Islands. Two areas at Grassy Point that currently harbor invasive cattail and *Phragmites* are proposed for the creation of a large and small island (Figure 13B). Island creation is intended to facilitate containment of existing deep deposits of wood waste and would establish an area of productive riparian transition zones, reducing exposure of adjacent shallow sheltered bay habitat, and increasing habitat diversity of the Grassy Point area.

Approximately 72,000 CY of material sourced from the Kingsbury Creek delta and Grassy Point areas will be applied to 10 acres to construct an island elevation of six feet. Placement of the material will occur during the winter months, in frozen or un-frozen conditions. Frozen material from Kingsbury Bay and possibly Grassy Point will be transported with trucks and contained within the placement areas using temporary berms. Sandy material will be placed as the top surface layer to stabilize the shoreline around the island and help to establish upland plantings. Native grasses, forbs, shrubs, and trees will be established on the islands after construction.

Restoration Site Unit 3 – Grassy Point Baymouth Bar. The baymouth bar will be an eight-acre extension of Grassy Point Island that will partially enclose the bay by reducing its exposure to high energy waves (Figure 8B), and thereby enhance nearby shallow sheltered bay habitat and create additional recreational potential. The area currently supports shallow open water habitat with a benthic community that statistically passes a normalcy threshold. Current depths of the area is 0 to 6 feet, with the majority in the 2 to 4 foot range (Figure 13B). Approximately 138,000 CY of material sourced from the Kingsbury Bay delta or within Grassy Point will be used to construct the bar to an elevation of six feet above average water level (AWL). The goal of establishing the baymouth bar is to contain wood wastes and artifacts to improve safety, aesthetics, and historic site preservation. The uplands will be planted with a native ground cover of herbs, shrubs and trees.

Restoration Site Unit 6 – Grassy Point Baymouth Bar Shallows. Additional work around the proposed baymouth bar (RSU 3) will included the removal of approximately 4,000 CY of waste

across three acres and adding 7,000 CY fill for capping dredged areas. The RSU's current depth ranges from 2 to 6 feet (Figure 13B). A transitional nearshore zone, with depth ranging from 2 to 4 feet, is being designed to support shallow marsh (Type 3) in RSU 6.

Construction timing is dependent upon creation of the baymouth bar (RSU 3). After excavation of wood waste, coarse-textured sand will be placed along the aquatic shoreline zone to support native emergent vegetation. No fine-textured biomedium from Kingsbury Bay will be placed away from shore on the east side of the baymouth bar or in the adjacent portions of RSU 13, due to the high energy environment affecting these areas. Some less exposed areas will receive fine sediments to enhance vegetation recruitment. Proposed water depths and substrate types were chosen to promote the reestablishment of aquatic plants via natural recruitment. Removal and placement of fine sediment materials will be timed for fall or early spring to maximize recruitment.

Restoration Site Unit 7 – Grassy Point Area of Concern. An approximately 23-acre area surrounding the existing island (largely RSU 2) will be excavated to remove 100,000 CY of legacy wood waste. Subsequently, the woody debris removal areas will be back filled with 40,000 CY of clean material. The RSU currently ranges in depth from 0 to 6 feet (Figure 13B). The proposed depth will range from 2 to 6 feet, designed to support shallow marsh (Type 3) and open water wetlands (Type 5) (Figure 13B).

Large wood waste that meets the fuel specifications used at Minnesota Power's Hibbard Bio-Fuel Plant will be removed mechanically from RSU 7 and transported off-site for drying. After removing the woody debris, fine-textured material from Kingsbury Bay will be placed over the remaining deposits to create a desirable depth and substrate supportive of aquatic plants and benthic organisms. Proposed water depths and substrate types and timing of work will replicate operations proposed in RSU 6 to promote aquatic vegetation.

Restoration Site Unit 8 – Grassy Point Open Water Creation. RSU 8 contains two units totaling eight acres. One unit is in the southwest portion of the Project area and the other unit is located to the west of the BNSF causeway. The second unit contains historic sand dredge spoil. The restoration objective in RSU 8 is to create shallow marsh and open water wetlands. Also a small upland island feature will be constructed in the middle of the southwestern unit in a similar manner as described for Grassy Point Island (RSU 2). The operation will involve the mechanical excavation of approximately 38,000 CY of legacy wood waste and back filling with approximately 9,000 CY of Kingsbury Bay excavated material. Some of the wood waste will be used at the Hibbard Bio-Fuel Plant if it meets specifications. The wood sediment mixes might provide suitable materials for building the upland island. The historic sand fill will be beneficially reused to construct the upland islands. Removing the sand will create approximately two acres of open water wetlands.

RSU 8 is primarily composed of a slightly elevated area, supporting scrub/shrub swamp vegetation (Type 6/7), and a smaller one-acre, 0 to 2 feet deep area that supports emergent marsh (Figure 13B). The swamp vegetation is primarily invasive narrow-leaved cattail and non-native common reed grass (*Phragmites australis*). Post-construction depths are designed to be 2 to 4 feet deep and supportive of shallow marsh (Type 3). The goal of the southwest area reconfiguration is to improve bay circulation, Keene Creek flow, and the area's protection from the St. Louis River (Figure 13B).

Restoration Site Unit 9 – Keene Creek Channel Expansion. RSU 9 embodies the lower Keene Creek channel entrance to the shallow marsh zone on the north shore of the Grassy Point Bay estuary. The three-acre RSU supports wet meadow and shallow marsh wetlands (Types 2 and 3) dominated

by narrow-leaved cattail and tag alder (Figure 14). The RSU has a current depth that ranges from 0 to 2 feet. The proposed depth will range from 2 to 4 feet and the Keene Creek channel will be enlarged and deepened (Figure 13B).

The wood/sediment mixes will be mechanically excavated and redistributed to other locations within Grassy Point, preferably RSU 2, RSU 3, and RSU 13. An isolated open water wetland adjacent to RSU 9 unit will be reconnected to the bay to improve marsh development and enhance fish and wildlife access and use. The elevated zone within RSU 9 might be used for stockpiling and processing of material dredged from within the unit.

Restoration Site Unit 13 – BNSF Causeway Softening. The Grassy Point Sector is bounded to the north by the BNSF railroad right-of-way. The causeway is fortified by a riprap that abruptly transitions to deep water (~ 10 feet) along historical dredged slips. This part of Grassy Point bay is devoid of a littoral transition zone and vegetated shoreline, limiting its ecological value.

The objective of RSU 13 is to restore the nearshore flank of the railroad to a natural, softened shoreline that provides a gradual transition from 0 to 4 feet deep, moving from terrestrial to aquatic habitat and emergent to floating-leaf and submergent vegetation in the deeper areas. Riprap and other hard structures along the right-of-way will be augmented with sand and fine textured earthen materials sourced from dredging activity. Material placement is proposed to occur both in frozen and un-frozen conditions. This RSU will also provide spawning/nursery areas for fish and feeding and nesting habitat for shorebirds.

C. Lower Keene Creek Channel and Wetland Sector (RSU 11 – Keene Creek Channel Restoration)

Lower Keene Creek Channel and Wetland sector is located in the Grassy Point Project Area, upstream of the Canadian Pacific railroad track and downstream of Waseca Industrial Avenue (Figure 3). To enable new road construction, in 1992 the Lower Keene Creek Channel was relocated to its current location where it flows into Grassy Point bay. This sector is a five-acre, 1,000 foot section of the creek where the current condition is channelized and ditched. Adjacent wetlands are separated from the stream by a soil berm with some rock/rubble in places. The proposed objective for this segment of Keene Creek (four acres) is to restore stream function and wetland connectivity to allow warm water fish, such as Northern Pike, Muskellunge, Longnose, and White Sucker better wetland access for spawning. Keene Creek flow will be temporarily diverted or pumped around the construction area to enable construction and minimize downstream water quality impacts. Work proposed in RSU 11 will not be conducted under this Project due to additional planning needs and funding constraints, but Keene Creek channel work proposed in RSU 11 has been included in this EAW as a recognized component of the overall restoration work proposed for Grassy Point.

Lower Keene Creek Channel and Wetland sector is a five-acre, 1,000 foot section of the creek where the current condition is channelized and ditched; adjacent wetlands are separated from the stream by a soil berm with some rock/rubble in places. The sector is located in the Grassy Point Project Area, upstream of the Canadian Pacific railroad track and downstream of Waseca Industrial Avenue (Figure 3). The proposed objective for this segment of Keene Creek (four acres) is to restore stream function and wetland connectivity to allow warm water fish, such as Northern Pike, Muskellunge, Longnose, and White Sucker better wetland access for spawning. Keene Creek flow will be temporarily diverted or pumped around the construction area to enable construction and minimize downstream water quality impacts. Work proposed in RSU 11 will not be conducted under this Project due to additional planning needs and funding constraints, but Keene Creek channel work

proposed in RSU 11 has been included in this EAW as a recognized component of the overall restoration work proposed for Grassy Point.

D. Impacted Sediments (Grassy Point) Sector (RSUs 10 and 10.1)

Initial sampling of sediments in the Grassy Point sector identified multiple, discreet locations of potential sediment contamination mapped as RSU 10. RSU 10 was formed to separate out areas of potentially elevated contamination that might warrant special treatment (Figure 3). After identifying these areas, the US Army Corps of Engineers (USACE) conducted additional sampling to conduct toxicity testing and bioaccumulation evaluation, which indicated insignificant toxicity to aquatic organisms at these locations (Attachment E, available upon request). Therefore, it is proposed to leave sediments undisturbed during Project construction. Additional contaminant information is provided under EAW Item 12. Contamination/Hazardous Materials/Wastes.

Restoration Site Unit 10.1 – Grassy Point Benthic Remediation.

After it was determined that no remediation of contaminated sediments was required at RSU 10, Project proposers reconfigured the RSU 10 footprint to create RSU 10.1. RSU 10.1 addresses areas where pre-construction sampling indicated that benthic organism communities were poor to extremely poor, as measured by the tri-metric index (TMI) (Attachment E, available upon request). The poor scores in these areas are not associated with contaminated sediments; therefore, some other characteristic of substrate quality or composition may be the cause and populations are likely to respond to remediation. To remediate this 10-acre area, a six-inch layer of organic material hydraulically dredged from Kingsbury Bay or sourced from USACE operation and maintenance dredging will be hydraulically placed within the indicated polygons. Material placement will be timed for late summer/early fall to maximize survivability and vegetative propagule viability.

E. XIK Dock #7, Material Stockpile Locations & Pipeline Corridor (RSU 12)

This sector represents the 28-acre XIK Dock #7, an industrial facility located to the west of the Grassy Point Area that consists of paved and gravel surfaces with access for both land and water traffic (Figure 3). The northern side of the dock nearly intersects the western tip of the Grassy Point area. Temporary facilities may be established on Dock #7 to handle dewatering, processing, and management of dredge material removed from the nearby Grassy Point area and possibly from the Kingsbury Bay project area. Material preparations such as grinding, turning, and sorting may also occur. It is anticipated that material management will be limited to approximately 10 acres of the dock. Containment berms will be constructed around storage sites used for settling and dewatering materials. The location may also be used as an area for equipment maintenance/storage and space for a project management trailer.

The pipeline that will transport excavated material from Kingsbury Bay to Grassy Point will follow along the western edge of RSU 12 from Kingsbury Bay to Grassy Point and might extend to the 40th Avenue West AOC project as indicated in Figures 2 and 4. No restoration is planned within the sector.

Mitigation Applied

Fortified construction entrances, timber work platforms, floating silt curtains, and other standard BMP appurtenances will minimize water quality impacts during construction. Work might include some landside excavation but will almost exclusively be in the Estuary. Both winter and mid-

summer/fall season dredging is planned, while seasonal construction activity before July 1 will be restricted or not permitted to minimize impacts on breeding and migrating birds and spawning fish. Additional permit conditions and BMPs are discussed under the appropriate EAW Item.

QAPP

A project-specific QAPP, which will define monitoring work necessary to assess post-project performance for a five year period, is under development. Monitoring will be aligned with specific goals and metrics, though monitoring might not evaluate every measure identified. The ecological risk assessment of latent sediment contamination will apply an analysis of data based on the Minnesota guidelines described in the QAPP.

In addition, long-term monitoring of ecological health of the St Louis River Estuary will continue during and after the five year post-project monitoring period, as defined in the QAPP. MNDNR Duluth Area Fisheries has partnered with WDNR, MPCA, USEPA MED Lab, and NOAA's National Estuary Research Reserve to conduct regular monitoring, assessment, and regulation in the estuary. Long-term monitoring is beneficial for determining the outcomes of AOC remediation and habitat restoration activities, which might not be fully ascertained when the five-year QAPP monitoring ends. Continued routine monitoring of condition and trends of water quality, habitat quality, and species composition as conducted by the participating agencies will be beneficial for the maintenance of habitat restoration outcomes.

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 productivity of coastal marsh habitat at Kingsbury Bay and Grassy Point has been degraded in the following ways:

- Kingsbury Bay has been degraded by excessive sedimentation received from Kingsbury Creek;
- Grassy Point has been degraded by rampant disposal of wood waste materials during the operation of early settlement lumber mills;
- Keene Creek, which now flows into Grassy Point, has been degraded by repositioning its flow path into the Bay by side-cast channelization;
- A railroad right-of-way at Grassy Point has created large sections of unvegetated hardened shoreline devoid of a littoral transition zone; and
- Industrial operations in the area have contributed to concentrations of contaminants within sediments at Grassy Point.

Due to the degradations listed above, the need for restoration at Kingsbury Bay and Grassy Point was identified in the Habitat Plan and Roadmap to Delisting ((St. Louis River Citizens Action Committee 2002) (WDNR and MPCA 2016)). The primary purpose of the proposed Kingsbury Bay -- Grassy Point project is to mitigate legacy impairments using ecological restoration principles to restore and enhance Lake Superior coastal marshes. Monitoring will be conducted to determine whether project outcomes meet the specific purposes stated below.

1) **Restore the wetland complex at Kingsbury Bay to pre-1961 conditions.**
   Objectives associated with this purpose include removing excess sediment and sand, removing non-native vegetation, and improving bathymetry.
2) **Remove non-native material at Grassy Point.**

Objectives associated with this purpose include remediating legacy wood waste, removing non-native vegetation, remediating potential contamination, and removing non-native sand deposits

3) **Restore optimum bathymetry at both Project areas.**
   Objectives associated with this purpose include increasing depth diversity, establishing deep off-channel overwintering habitat, creating littoral transition zones, promoting hydrodynamics and seiche impacts, and promoting resiliency.
4) **Restore and enhance coastal wetland habitat at both Project areas.**
   Objectives associated with this purpose include increasing seiche influence, connecting isolated wetlands, promoting diverse native vegetation, and creating shallow sheltered bay conditions.
5) **Support the removal of AOC BUI 9 by increasing fish and wildlife habitat at both Project areas.**
   Objectives associated with this purpose include improving bathymetry, removing non-native vegetation, promoting diverse terrestrial and aquatic native vegetation, promoting a diverse benthic community, increasing natural shoreline, replacing non-native substrates with suitable natural materials, and establishing deep off-channel overwintering habitat.
6) **Positively impact human health at both Project areas.**
   Objectives associated with this purpose include supporting recreation, improving aesthetics, promoting engagement with nature, promoting opportunities for social interaction and culture, and restoring sites to a condition that supports and compliments City of Duluth plans for future revitalization of the Project areas.
7) **Maximize restoration potential through project efficiency at both Project areas.**
   Objectives associated with this purpose include achieving ecological purposes using available funds, efficiently and beneficially managing materials, and minimizing waste.

The Project is being proposed by MNDNR as part of the Area of Concern (AOC) delisting process and in partnership with the Minnesota Land Trust (MLT), MPCA, United States Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), WDNR, and the Fond du Lac Band of Lake Superior Chippewa. Additionally, the Kingsbury Bay portion of the combined project will be implemented as part of the NRDA settlement for the SLRIDT Superfund Site. The people of Minnesota and Wisconsin, and specifically the citizens of Duluth, Minnesota and Superior, Wisconsin will be the beneficiaries of the habitat improvements achieved at Kingsbury Bay and Grassy Point.

d. Are future stages of this development including development on any other property planned or likely to happen? X Yes
   If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review**.**

The proposed Project is a major element of the process to delist the St. Louis River AOC as well as the primary element of restoration associated with the NRDA settlement for the SLRIDT Superfund Site. Ongoing and future phases of work associated with the AOC process in Minnesota waters are listed below; including the proposed Project, these restoration activities will combine for approximately 800 acres of the 1,700-acre AOC habitat restoration target.

- The current work near 21st Avenue West with an expected 2019 completion date (majority of work was completed in 2017);
- Construction at 40th Avenue beginning in 2017 with a projected completion before 2020; and
- Future remediation of contaminated sediments at the ponds behind Erie Pier.

Both 21st and 40th Avenue projects involve placement of fill to cap and insulate legacy contamination found at these locations from the benthic zone. Much of the fill will be sandy sediments

transported by the USACE during its dredging operations from the Federal Navigation Channel, which annually yields approximately 100,000 to 150,000 CY of material. Dredge materials are placed over impaired sediments to create variable water depths to encourage the growth of diverse aquatic vegetation, a healthy benthic macroinvertebrate community, and reduce the risk of contaminant exposure to the food web. The final component of these projects will include the application of an organic material layer for improving the site for benthic organisms and rooted aquatic vegetation. This material may be sourced from Kingsbury Bay.

Long term interest to improve Keene Creek stability by introducing sediment reduction measures in the watershed exists, although not proposed as part of this project. The lower Keene Creek project will be incorporated into Keene Creek stabilization work plans as funding and staff become available. MNDNR is also proposing a Perch Lake restoration project to remove excessive sediment and improve bathymetry with a planned completion date of 2019 or 2020, therefore no environmental review has been initiated.

Following the completion of final construction design plans for the Project, a supplemental Habitat Restoration Plan will be developed to continue restoration efforts both within and outside of the Kingsbury Bay – Grassy Point Project area. The MNDNR will collaborate with project partners, including the U.S. Fish and Wildlife Service, NRDA Restoration Program, and Minnesota Land Trust, and with local resource management professionals to enhancing terrestrial (riparian) and nearshore aquatic vegetation and control extant and potentially new populations of exotic and invasive species. The Plan is described in further detail in Item 13 below.

Besides funding the Kingsbury element of the proposed Project, NRDA restoration funds (SLRIDT NRDA 2017) will be applied to two additional projects slated for development in 2017 through 2019, Kingsbury Creek and a component of the St. Louis River Estuary Wild Rice Restoration Project. Erosion from Kingsbury Creek has increased sedimentation to Kingsbury Bay, which has resulted in reduced ecological services provided by the Bay, including eliminating aquatic habitat and encouraging the growth of monotypic stands of cattail within the bay. The Kingsbury Creek project will stabilize the creek channel by reducing sediment washing into the bay from Kingsbury Creek. In the second project, wild rice will be planted in portions of the Project site and other areas in the St. Louis River Estuary in Wisconsin and Minnesota as part of the St. Louis River Estuary Wild Rice Restoration Project, based on the Wild Rice Restoration Implementation Plan for the St. Louis River Estuary (MNDNR 2014). Wild rice restoration would be conducted in collaboration with cultural educational opportunities by constructing displays that communicate the importance of wild rice to the health of the St. Louis River estuary as well as to maintaining the cultural traditions of local tribes.

Once construction has been completed, the City of Duluth has indicated that it intends to improve recreation via upgrades to trails and access points on the Grassy Point Project area. However, the City's plan is under development at this time.

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

In 1994 and 1995, MNDNR completed a demonstration project to restore about three acres of deep marsh/channel habitat at Grassy Point by removing 11,000 cubic yards of legacy wood waste and derelict rail bed originating from historic saw-milling operations. Following excavation, submergent and emergent aquatic vegetation diversity and abundance increased and overall habitat condition

improved. This can be visually observed by viewing the August, 2010 Google Earth image of the area. In the 1997 or 2010 image (compared to 1992), areas other than RSU 10 that exhibit aquatic vegetation were within the footprint of the 1995 project. Additionally, trap netting results documented substantial use of the restored habitat by many species and life stages of fish. The USEPA's Great Lakes National Program Office provided most of the funds to complete the project.

Attachment B provides an overview of the AOC projects that are part of the 2020 AOC delisting actions. To date, actions underway or completed under the AOC RAP (MPCA and WDNR, 2015) for the Fish and Wildlife Habitat impairment include (EAW completed):

- 21st Avenue West, with a planned completion in 2018
- 40th Avenue West Aquatic Habitat Restoration with a planned completion date of 2020; includes a second phase in 2018-19 for applying organic material from the proposed Project

Additional MNDNR projects completed (initiated after EAW) include:

- Radio Tower Bay open water habitat (dredging of wood waste) completed in 2015
- Knowlton Creek Stream Restoration (stream stabilization and sediment reduction) work completed in 2017
- Chambers Grove shoreline improvement and habitat for riffle spawning species completed in late 2015

7. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

Kingsbury Bay (80 ac) and Grassy Point (160 ac) Project areas and the Dock#7 staging area (28 ac) include the following cover types: upland vegetation/industrial/dock, scrub-shrub/wooded swamp-wetland, fresh meadow/shallow fresh marshes, open water wetland, and deep water. The following tables show project areas (Kingsbury Bay, Grassy Point, Dock #7 Ancillary). Dock #7 is a proposed staging area for storage and transport of materials. Determine the construction area (extent of restoration work: filling, dredging, capping and other actions) by subtracting unaffected wetland acreage from the total values.

Kingsbury Bay Restoration Project Area

	Before	After		Before	After
Wetlands	64	64	Lawn/landscaping	0	0
Deep water/streams	0	0	Impervious surface	0	0
Wooded/forest	0	0	Stormwater Pond	0	0
Brush/Grassland	0	0	Other (describe)	0	0
Cropland	0	0	Unaffected wetland	16	16
			TOTAL	**80**	**80**

Grassy Point Restoration Project Area

	Before	After		Before	After
Wetlands	69	81	Lawn/landscaping	0	0
Deep water/streams	77	47	Impervious surface	8	8
Wooded/forest	3	21	Stormwater Pond	0	0
Brush/Grassland	3	3	Other (describe)	0	0
Cropland	0	0			

	Before	After		Before	After
			TOTAL	**160**	**160**

Dock #7 Ancillary Area

	Before	After		Before	After
Wetlands	0	0	Lawn/landscaping	0	0
Deep water/streams	0	0	Impervious surface	0	0
Wooded/forest	0	0	Stormwater Pond	0	0
Brush/Grassland	0	0	Other (soil/spoil/ impervious)	28	28
Cropland	0	0	Pipeline (~2 miles)[1]	N/A	N/A
			TOTAL	**28**	**28**

[1] Pipeline corridor not calculated as part of project area.

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 review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Unit of government	Type of application	Status
MNDNR	Public Waters Work Permit	To be submitted
MNDNR	Water Appropriations Permit - Temporary	To be submitted
MNDNR	Prohibited Invasive Species Permit	To be submitted
MNDNR	Lake Superior Coastal Zone federal consistency letter	To be submitted
MPCA	Management of dredged Material Permit	To be submitted
MPCA	NPDES/SDS Construction Stormwater General Permit	To be submitted
MPCA	CWA Section 401 Certification	To be submitted
	Solid Waste	To be submitted
MPCA	Compost Facility	To be submitted
USACE	CWA Section 404 Permit	To be submitted
USACE	Section 10 Permit – Rivers and Harbors Act	To be submitted
USACE	Section 106 Consultation – National Historic Preservation Act	To be submitted
LGU	Wetland Conservation Act - MN	To be submitted
WLSSD	Wastewater Discharge Permit	To be submitted
MN-SHPO	Section 106 Consultation – National Historic Preservation Act	To be submitted
DULUTH	Grading and Erosion Control	To be submitted
DULUTH	MS4 Compliance Statement	To be submitted
DULUTH	Temporary Access Agreement	To be submitted, if required
DULUTH	Special Use Permit for Construction	To be submitted, if required
DULUTH, MNDNR, FEMA	No Rise Certification and/or LOMR	compliance
USFWS	Migratory Bird Treaty Act	Under consultation

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 Project is located in the St. Louis River Estuary on the upstream end of the St. Louis Bay, Duluth, Minnesota (Figure 2). The Project consists of two areas, Kingsbury Bay and Grassy Point totaling 240 acres. No prime or unique farmlands exist at either site.

Kingsbury Bay

Kingsbury Bay is a sheltered bay within the St Louis River Estuary. The Project area encompasses the bay, the mouth of Kingsbury Creek, and aquatic areas around Indian Point. Portions of the Project

area serve as an aquatic sheltered bay habitat, though increased sediment deposition over time has significantly decreased the extent of this habitat (Figure 5) such that the delta is now primarily composed of narrow-leaved cattail.

The shoreline is publicly owned by the City of Duluth. There are several privately owned parcels on the bay's southeast shore. Existing land use of areas adjacent to the site include the City's Indian Point Campground located south of the delta, residential neighborhoods to the north and east of the Project area, and Highway 23 to the northwest. The bay is currently used as wildlife and fisheries habitat, outdoor recreation, and viewscape for nearby residents.

The Western Waterfront Trail (WWFT) follows along the entire circumference of the bay. The trail offers approximately five miles of public waterfront access and was designed to provide non-motorized access along portions of an old railroad right-of-way. The trail links the Riverside neighborhood to the Lake Superior Zoo. The WWFT parallels the Willard Munger State Trail, which is a paved pathway that links this area to Jay Cooke State Park and communities south of Duluth.

Grassy Point

Grassy Point is a sheltered bay within the St. Louis River Estuary that acts as a wildlife and fisheries production area. Habitats include emergent and open water wetlands, undeveloped uplands and the lower Keene Creek channel. Grassy Point is also important for outdoor recreation. The area has a parking lot and trail system which includes a bridge over Keene Creek and two viewing/fishing platforms, although the trail and bridge have fallen into disrepair and access is currently blocked.

Land use on areas adjacent to the site include the Burlington Northern Santa Fe Railroad line to the north, the maintained navigational shipping channel to the east, and the C. Reiss Coal and bulk material handling dock to the southwest (Figure 8B).

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.

City of Duluth Comprehensive Land Use Plan

Duluth's Comprehensive Land Use Plan and Current Version of Future Land Use Map is a geographic representation of the City's preferred land use scenario for 2025). It summarizes the community's discussion of how development, preservation, and public realm investment should be made over the next 8 years. The City of Duluth comprehensive plan identifies a future use of preservation at both Kingsbury Bay and Grassy Point. Restoration plans contained in the Kingsbury/Grassy Project support this future land use.

St. Louis River Corridor Initiative

The St. Louis River Corridor Initiative is a $50 million park investment plan spanning an area between Fond du Lac and Lincoln Park. The initiative consists of 26 projects supporting the goals of environmental restoration, enriching neighborhood quality of life, attracting new homebuyers, establishing visitor destinations, and stimulating economic development. Of these 26 projects, four are relevant to the Kingsbury - Grassy Project Area: Cross City Trail, Kingsbury Bay Restoration, Indian Point Renewal, and the Western Waterfront Trail. The Indian Point Renewal Project has not been initiated at this time; the remaining projects are in development:

- *The Duluth Cross City Trail Mini Master Plan*

This plan calls for a 10.3 mile multi-purpose, non-motorized, wheelchair-accessible, paved trail system connecting the Lakewalk and Canal Park in downtown Duluth to the Munger Trail, the Western Waterfront Trail, the Lake Superior Zoo, and Spirit Mountain Recreation Area in western Duluth. A portion of Grassy Point Trail through Irving Park is proposed to be used for the Cross City Trail and a connection trail is proposed near Kingsbury Bay.

- *Kingsbury Bay Concept Plan*

The City of Duluth and its project partners, including state and federal agencies, developed a conceptual restoration design for Kingsbury Bay in 2016 (Figure 8A). Primary goals include the following:

- Develop and protect open water habitat;
- Create access and recreational opportunities to the bay;
- Create opportunities for wild rice regeneration;
- Protect what has been restored by reducing sediment washing into the bay from Kingsbury Creek.

Restoration plans contained in the Kingsbury – Grassy Point Project were developed in conjunction with the City's Kingsbury Bay Concept Plan and directly support Plan objectives.

- *State Wildlife Action Plan 2015 - 2025*

The State Wildlife Action Plan 2015 – 2025 has identified richness hotspots of Species in Greatest Conservation Need (SGCN). SGCN are defined as native animals, nongame and game, whose populations are rare, declining, or vulnerable to decline and are below levels desirable to insure their long-term health and stability. Also included are species for which Minnesota has a stewardship responsibility. The SGCN population areas that produced the top 95% scores of mapped SGCN populations are recognized as Minnesota Conservation Focus Areas (CFA). The St. Louis Bay Estuary was classified as a CFA. The Estuary received a Medium High score for conservation value and need.

Western Waterfront Trail Master Plan

The proposed Kingsbury/Grassy Project is relevant to the City's Master Plan of expanding the Western Waterfront Trail, which currently offers nearly five miles of waterfront access. A public planning process that began in August 2016 evaluated future recreational uses of a mostly City-owned, 10 to 12-mile corridor along the St. Louis River. The Master Plan's overall project goals include, but are not limited to the following:

- Restoring and protecting natural habitat along the trail corridor;
- Increasing connectivity from adjacent neighborhoods to the St. Louis River and Estuary; and
- Increasing recreational and development opportunities within and along the St. Louis River Corridor.

Restoration plans contained in the Kingsbury - Grassy Project support the master plan.

St. Louis River Corridor Grassy Point Park Master Plans (City of Duluth)

As part of the park's master plan, a conceptual design for Grassy Point Park was developed with support from state and federal agencies (Figure 8B). Key features include habitat restoration through the following activities:

- Open water habitats and littoral zone improvements;
- Creek channel improvement and wetland reconnection; and
- Open marsh restoration and habitat improvement.

The City's plan also features improved access and trails, increased wildlife viewing opportunities, and educational components. Restoration plans contained in the Kingsbury and Grassy Point Project areas were developed in conjunction with the City's park plan and directly support its objectives.

Duluth Superior Port Land Use Plan (2016)

The Duluth-Superior Port Land Use Plan was developed by the Duluth-Superior Metropolitan Interstate Council (MIC). The comprehensive port developmental plan serves the "working port" of the cities of Duluth, MN and Superior, WI. The plan's Future Land Use Map includes the Grassy Point Project area and describes the vision for the Port of Duluth-Superior for the next 20 years. The Grassy Point Project area is designated as natural area which is available for outdoor recreation and public water access locations. Restoration plans contained in the Kingsbury - Grassy Project support this future land use plan.

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

The Kingsbury/Grassy Point Project is compatible with the following local zoning and overlay districts:

i. Floodplain:

In accordance with Duluth zoning regulations regarding floodplain ordinances, Article II, Section 51-16 states this Project is permitted under Rule a3, falling in the category of a wildlife and nature preserve, fish hatcheries, and fishing areas.

Based on the most current floodplain map dated November 4, 1992, the entirety of the Kingsbury Bay Project Area and a majority of the Grassy Point Project Area lie within a designated FEMA 100-year floodplain. A small point of the Grassy Point Project Area located north of the rail line is located within a designated FEMA 500-year floodplain. The water level of the Estuary is controlled by the surface elevation of Lake Superior and river flow has a minor effect on flood elevation. The proposed Project will not increase floodplain capacity nor change the frequency, magnitude, or extent of the flooding.

ii. City of Duluth Zoning

The Kingsbury Bay Project Area is currently zoned as Residential Traditional (R-1) in the vicinity of Kingsbury Creek and the majority of the sheltered bay. The southern portion of Kingsbury Bay is zoned as Industrial Waterfront (I-W). The majority of the Grassy Point Project area is currently zoned as Industrial Waterfront (I-W), with the upper portion of Keene Creek zoned as Industrial General (I-G). Applicable City of Duluth zones are described below.

Industrial-Waterfront (I-W) - The I-W district is intended to provide for water-dependent and port-dependent industrial uses. Office structures are allowed providing they clearly are incidental and supportive of on-site industrial uses.

Industrial-General (I-G) - The I-G district is intended to provide for general to heavy impact industrial, processing, assembly, fabrication and manufacturing uses. Office uses are allowed provided they clearly are incidental and supportive to those industrial uses. The district is intended primarily for locations close to major transportation corridors and active commercial centers.

Residential-Traditional (R-1) - The R-1 district accommodates traditional neighborhoods of single-family detached residences, duplexes and townhouses on moderately sized lots. This district is intended primarily for established neighborhoods. Many of the dimensional standards in this district require development and redevelopment to be consistent with development patterns, building scale, and building location of nearby areas.

The objectives of the proposed Project are compatible with existing local land use and the City of Duluth Zoning. The proposed project will not result in any changes to current zoning designations.

iii. Lake Superior Coastal Zone

The Project is within the Lake Superior Coastal Zone under the jurisdiction of the Minnesota Lake Superior Coastal Program (MLSCP) as administered by the MNDNR. The Project is a federal action that has reasonably foreseeable effects on coastal uses or resources. It will be subject to the Federal Consistency Review. The MNDNR and federal agencies must follow the requirements of 15 Code of Federal Regulations (CFR) 930, Subpart C, which require a review of federal activities or federally funded projects to determine consistency, to the maximum extent practicable, with the enforceable policies of MLSCP.

The evaluation of federal consistency by MNDNR is a brief evaluation of the relationship of the proposed activity and its reasonably foreseeable coastal effects considered enforceable under the review. The review includes identifying whether federally approved state coastal policies are met, such as approved county shoreland ordinances and approved floodplain ordinances. The proposed project appears to be compatible with the terms of the review.

iv. Other

Kingsbury Creek, Keene Creek, and the St. Louis River are not designated as wild and scenic rivers or critical areas.

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

The environmental effects associated with the Kingsbury and Grassy Point Project areas include restoring fish and wildlife habitat, removing legacy wood waste and dredge material, and restoring wetlands at the bay mouths and lower sections of contributing creeks. The proposed Kingsbury and Grassy Project is compatible with nearby land uses, local zoning ordinances, and associated governmental plans. In some cases, local plans are dependent on Project completion.

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

No potential incompatibility was identified between the proposed Project and nearby land uses, zoning and plans discussed above.

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 St. Louis River Estuary is within the Glacial Lake Duluth physiographic region characterized by fine grained lacustrine deposits, beach ridges and sequences of clay, silt, sand, and gravel marking the procession and recession of Ice Age Glaciers. The city of Superior, Wisconsin borders the south side of the Bay. The near-surface sediments consist of deposits of variable thicknesses of silt, sand, peat and clay representing the varied historical flow patterns through the Bay and lacustrine deposits from glacial lakes. Up to 700 feet or more of sediments lie on top of underlying bedrock within the St. Louis River basin.

The Project site subsurface geology consists of the following two primary features, which are part of the Duluth Complex:

- *Troctolitic and gabbroic cumulate rocks*—Constitutes at least nine named and several unnamed intrusions.
- *Anorthositic series*—Plagioclase-rich gabbroic cumulates and related rocks.

Both features are considered to be Mesoproterozoic rocks and consist of metamorphic and igneous rocks (Morey and Meints 2000).

The Project will not affect geology, nor does geology affect the Project. Based on the underlying geology, there are no areas within the Project that are susceptible to sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. No karst features are mapped within the proposed project area.

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.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

Kingsbury Bay and Grassy Point are situated on the eastern edge of the North Shore Highlands Subsection of the Laurentian Mixed Forest Province (MNDNR Ecological Classification System). Soils consist of lake and riverine sediments. The surrounding area's primary landform is a ground moraine and end moraine associated with the Superior Lobe of the Late Wisconsin glaciation. The dominant landscape feature is flat to rolling, with steep, narrow ravines along many streams. There are also outwash deposits along the western edge of the subsection. Soils of the subsection are developed from rocky, red tills of the Superior Lobe. Textures range from sand to clay. Loams and sandy loams are the most common soil textures on the moraines, which occupy most of the subsection. The uplands around Kingsbury Bay and Grassy Point have been affected by human influence in the form of sedimentation and legacy wood waste accumulation.

Topography of the area is relatively flat (less than 2% slopes). Terrestrial areas of the Project are primarily wetlands and are within six feet of the water surface. The remainder of the Project area is in open water ranging from 0-10 feet deep.

Kingsbury Bay

Soils in the immediate Project area are primarily classified by the NRCS as Bowstring and Fluvaquents, loamy, 0-2% slopes, frequently flooded (1020A) (Figure 9). These soils are derived from an organic and alluvium parent material and occur in flats on flood plains.

Soils adjacent to the Project area consist of the following:

- **1026A**—Udifluvents, loamy, 0 to 2 percent slopes, occasionally flooded
- **E16D**—Amnicon-Cuttre complex, 5 to 18 percent slopes
- **E24F**—Miskoaki-Cuttre complex, 5 to 45 percent slopes
- **F155B**—Udalfs-Eutrudepts complex, 0 to 8 percent slopes
- **F155G**—Udalfs-Eutrudepts complex, 25 to 70 percent slopes

Dredging activities at Kingsbury Bay will be conducted to remove the delta feature and other accumulated sediments within the bay. Dredged materials are planned for beneficial reuse at nearby Grassy Point.

Grassy Point

The bulk of soils on this site are classified by the NRCS as an Urban land- Udorthents-Aquents complex, 0-8% slopes (1028A), with a very small portion of the Project area classified as Bowstring and Fluvaquents, loamy, 0-2% slopes, frequently flooded (1020A)(Figure 9). 1028A is derived from mixed parent material consisting of loamy alluvium, sandy beach materials, and dredge materials and is characteristic of rises, flats and depressions of spits and shorelines. 1020A is derived from parent material consisting of alluvium and organic material mixed with alluvium.

Geotechnical investigations were conducted at Grassy Point in 1995, 2013, and 2014 to assess the nature and extent of sediment and wood waste and evaluate concept designs for construction of an island into the bay (American Engineering Testing, Inc. 1995) (GEI Consultants 2014) (USACE 2015). Sediment samples collected from the open water portions of the Project area show the presence of silt and sand materials with a mixture of organics, peat and large amounts of legacy wood waste (wood chips and sawdust).

The northeast and north parts of the site consist of swamp deposits (peat) with a mixture of peat and varied-size wood waste comprising the remaining area. Wood waste varies in depth between 2.0 and more than 16.5 feet. Based on field investigations and observations, sizes range from large slabs of wood and waste tree bark to smaller wood pieces and saw dust. Based on typical dredging equipment and limitations of the equipment, the wood waste is separated into two groups; wood pieces greater than three (3) inches and wood waste smaller than three (3) inches. Hydraulic dredging typically cannot handle material greater than three (3) inches without risk of equipment problems.

Two cross sectional profiles revealed peat and wood mixtures underlain by sand and silt with low plasticity clays and high plastic clays below. Regarding the potential for island creation, the USACE concluded that peat/wood layers will compress, be displaced laterally and/or have shear stress induced failure. Underlying sand, silt, and clay can support loads with some potential consolidation.

Barr Engineering will conduct additional geotechnical analysis in 2017 to gather parameters for use in final design and construction. Sampling and laboratory testing will accurately determine settlement or slope stability for the proposed island expansion or behavior of the material from RSU 1, RSU 2, and part of RSU 8 during and after placement.

Dredge Material Management

Multiple sampling efforts have helped characterize sediment across the Project Area in evaluating the type and level of pollutants in comparison to the MPCA's established Soil Reference Values (SRVs). The SRVs are defined as generic health-based criteria for soil and health risk limits that are based on a standard exposure scenario for contaminated sites. The sediment characterization was necessary to determine the Management Level for defining the dredge material disposal options. Sediment characteristics will be assessed against SRVs during the permitting process.

The suitable beneficial use category of the dredged material is based on whether analyzed characteristics of contaminants in the dredged material remain below certain thresholds defined by the Soil Reference Value (SRV). Each threshold is characterized by a contaminant level that is at or below the respective concentrations listed for any contaminant that can be reasonably expected to be present in the dredged material. The scope of use of dredge material is defined by the MPCA as Management Level based SRV's for contaminants:

- Level 1 material is authorized to be used at/on sites with a residential property use category (beneficial use of sediment allowed);
- Level 2 material is authorized to be used at/on sites with an industrial or recreational use category (beneficial use of sediment allowed); and
- Level 3 material is not authorized to be put to a beneficial use and generally requires disposal in a licensed landfill. Level 3 material is characterized by a contaminant level that is greater than any respective analyte concentrations listed in the Level 2 Recreational and Industrial SRV columns.

Sediment samples were also analyzed for contaminants to determine sediment quality for supporting benthic organisms. Materials above sediment quality target level II (SQT II) were analyzed further to determine the nature and extent of contamination and whether materials would require remediation. Sediment contaminants and management alternatives, including, containment by capping, sequestration, and disposal, are discussed in more detail under Item 12.

11. Water resources:

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

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 Kingsbury Bay project is located on the St. Louis River, within the St. Louis River Bay, approximately one mile upstream from the Grassy Point area and five miles upstream from its mouth to Lake Superior. Kingsbury Bay – Grassy Point project area is within or near the Irving, Fairmont, Norton Park, and Riverside neighborhoods of Duluth. Lake Superior (PWI 16-1) including St. Louis River Bay is designated as an outstanding resource value water. The Project is located within the St. Louis River Estuary where Lake Superior's seiche influences the Bay's water levels and flow patterns of the St. Louis River (Figure 2). The project area includes the mouths of Kingsbury Creek, which flows into Kingsbury Bay, and Keene Creek, which flows into the Grassy Point site.

Kingsbury Creek flows into the Kingsbury Bay portion of the St. Louis River Bay. The 11.5 mile long system (main stem and tributaries) has an average slope of 4.5 percent. The Kingsbury Creek watershed drains about 9 square miles. The ratio of roads to creek length is 4:1. Nearly 75 percent of the watershed is vegetative cover, seven percent is wetland, and about 18 percent is urban-rural development. Urban development has resulted in about 12 percent impervious surface cover in the watershed. The stream is regularly monitored for water quality, including its sediment load.

During heavy rainfall events, Kingsbury Creek has contributed large amounts of sediment into Kingsbury Bay. Some efforts to stabilize the creek channel and improve connectivity have been completed and additional projects are being proposed. A new culvert which improved fish passage was recently installed for the Grand Avenue crossing. The Burlington Northern/Santé Fe railroad culvert at Kingsbury Creek, just below Grand Avenue, was also recently replaced with a bridge. Kingsbury Creek is a designated trout stream.

Keene Creek flows into the Grassy Point project area. About 30 years ago, the lower segment of Keene Creek was channelized by side casted dredging and diverted from its natural mouth location to a more easterly entrance to the river at Grassy Point. The channelized section is degraded and has limited flow connectivity to adjacent marsh habitat. Keene Creek drains a 3.3 square mile watershed and has 8.4 miles of stream channels, including tributaries. It has a 4.2 ratio of roads to stream length and an average slope of 3.3 percent. About 85 percent of the watershed is vegetated, 13 percent is urban-rural development and one percent is wetland. About twelve percent of the watershed is impervious surface cover. Keene Creek is a designated trout stream.

Kingsbury Bay wetlands

The USFWS National Wetlands Inventory (NWI) wetlands designations (based on 1978 imagery) included 17 acres of shallow marsh (Type 3), mostly on the Kingsbury Creek delta, and four acres of wooded swamp (Type 7). The USFWS did not classify the open water portions within the project area as wetlands, instead designating these areas as Riverine Systems (Figure 11A).

Based on recent 2013-2015 vegetation sampling conducted by NRRI, vegetation communities included: sparse submerged macrophyte bed, mixed macrophyte bed, and floating/submerged macrophyte bed (Figure 15). The wetland communities are found in water ranging 1.0 to 8.4 feet deep, indicating that a mixture of both shallow marsh (Type 3) and open water wetlands (Type 5) occupy the unmapped wetland areas. Typical aquatic plants representative of the wetland types are described under Item 13.

During winter 2016, Fond du Lac Resource Management delineated cattail stands within the Kingsbury Bay Project area (Figure 11A). Results indicated invasive narrow-leaved cattails dominated the Type 3 shallow marsh areas of the delta.

A September 9, 2015, a wetland delineation was conducted by the U.S. Army Corps of Engineers, St. Paul District Regulatory Branch (USACE 2015b). The Area of Investigation (AOI) chosen for the cultural resource study included only a portion of the Kingsbury Bay project area. The three delineated wetland areas in the AOI contained shallow to deep marsh areas, with a portion identified as wet meadow and hardwood swamp on the eastern point (Figure 11A). In the AOI portion that overlapped part of the USFWS NWI shallow marsh (Type 3) delineation, the USACE identified the same shallow marsh wetland type. The USFWS, USACE, and NRRI assessments collectively provide an accurate understanding of wetland types in the Project area. The wetland inventories collectively identify that a majority of the Type 3 wetlands are degraded and dominated by invasive species, mainly narrow leaved cattails, and the Type 5 wetlands range throughout the un-delineated open water portions of the bay.

Grassy Point Wetlands

Based on 1978 imagery, the USFWS NWI identified six wetland types within the Grassy Point Project area, ranging from shallow open water to forested swamps (Figure 11B). In spring/summer 2013 LHB, Inc. delineated wetlands at Grassy Point (LHB 2013) (Figure 11B). The delineation matched the NWI results in locating the upland/wetland boundaries. The USFWS bog wetlands (Type 8) were recognized as wooded swamp (Type 7) in the LHB, Inc. 2013 survey. Fringe wetlands along the shoreline of Keene Creek were recognized by LHB, Inc. but not by the USFWS. The NWI and 2013 delineations did not classify the open water portions of the Grassy Point Project area as wetland (Figure 11B). Recent NRRI mapping completed in 2013-15 found these areas contained little vegetation, with sporadic submerged wetland vegetation along the creek channel and near shorelines (Figure 15). The vegetated areas were found in water that ranged from 1 to 2.4 feet deep, indicating that a narrow gradient of shallow marsh (Type 3) and open water wetlands (Type 5) occupy the un-delineated areas.

Water Use Classifications

The Project Site is classified by the MPCA under Minn. R. 7050.0470 as a Class 2B, 3C, 4A, 4B, 5, and 6 waterbody. The St. Louis River has protection status as outlined by the general standards for waters of the state (Minn. R. 7050.0210) and the specific water quality (WQ) standards for each class (Minn. R. 7050.0220 through 7050.0226). The MPCA identified the applicable state classifications and the referenced water quality standards below:

Class 2B: Minn. R. 7050.0222, subp. 1 and 4. Defines applicable WQ standards for aquatic life and recreation (includes cool and warm water sport fish).

Class 3C: industrial consumption (includes all waters of the state that are or industry may use as a source of supply for industrial process or cooling water, or any other industrial or commercial purposes, and for which quality control is or may be necessary to protect the public health, safety,

or welfare). Class 3C also specifies the protection of cool and warm water sport fish, indigenous aquatic life, and wetlands. Minn. R. 7050.0223, subp. 1 and 4 describes these applicable WQ standards.

Class 4A and 4B: agriculture and wildlife. Includes all waters of the state that are or agriculture may use for any agricultural purposes, including stock watering and irrigation, or by waterfowl or other wildlife and for which quality control is or may be necessary to protect terrestrial life and its habitat or the public health, safety, or welfare. Class 4A also includes a sulfate limit of 10 milligrams per liter (mg/L) for the protection of wild rice where it is present. Class 4A waters also include cold water sport fish (trout waters) and 4B waters include cool and warm water sport fish. Minn. R. 7050.0220 subp. 3a and 4a, and 7050.0224, subp. 1, 2 and 3 defines these applicable WQ standards.

Class 5: aesthetic enjoyment and navigation. Minn. R. 7050.0220, subp. 3a, and 7050.0225 define these applicable WQ standards.

Class 6: other uses and protection of border waters. Minn. R. 7050.0226 defines these applicable WQ standards.

Further, the more restrictive WQ standards for the parameters listed at Minn. R. 7052.0100, subp. 5 (e.g., total mercury limit of 1.3 ng/L) applies to the St. Louis River because it is within the Lake Superior Basin.

List of MPCA/CWA Impairments in the Project Area

The St. Louis River, Kingsbury Creek, and Keene Creek are listed as impaired on the MPCA CWA Impaired Waters List. The Project Site includes the St. Louis River impairments listed in the table below:

MPCA 2014 Draft Impaired Waters List (Section 303(d) of the Clean Water Act)

Reach name	Reach Description	Year added to List	Stream/River Segment ID	Affected designated use	Pollutant or stressor
Keene Creek	Headwaters to St. Louis Bay (SLB)	2012	04010201-627	Aquatic Recreation	*Escherichia coli*
Kingsbury Creek	Mogie Lk to SLB	2012	04010201-626	Aquatic Life	Aquatic Macroinvertebrate Bioassessments
Kingsbury Creek	Mogie Lk to SLB	2012	04010201-626	Aquatic Life	Fishes Bioassessments
St Louis River (SLB)	Mouth of SLB at Blatnik Bridge to Duluth Ship Channel (DSC)	2002	04010201-530	Aquatic Consumption	DDT
St Louis River (SLB)	Mouth of SLB at Blatnik Bridge to DSC	2002	04010201-530	Aquatic Consumption	Dieldrin

Reach name	Reach Description	Year added to List	Stream/River Segment ID	Affected designated use	Pollutant or stressor
St Louis River SLB)	Mouth of SLB at Blatnik Bridge to DSC	2002	04010201-530	Aquatic Consumption	Dioxin (including 2,3,7,8-TCDD)
St Louis River SLB)	Mouth of St Louis Bay at Blatnik Bridge to DSC	1998	04010201-530	Aquatic Consumption	Mercury in fish tissue
St Louis River (SLB)	Mouth of St Louis Bay at Blatnik Bridge to DSC	1998	04010201-530	Aquatic Consumption	Mercury in water column
St Louis River (SLB)	Mouth of St Louis Bay at Blatnik Bridge to DSC	1998	04010201-530	Aquatic Consumption	PCB in fish tissue
St Louis River (SLB)	Mouth of St Louis Bay at Blatnik Bridge to DSC	1998	04010201-530	Aquatic Consumption	PCB in water column
St Louis River (SLB)	Mouth of St Louis Bay at Blatnik Bridge to DSC	2002	04010201-530	Aquatic Consumption	Toxaphene

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 Kingsbury and Grassy Point Sectors are located on the St. Louis River Bay and are exclusively confined to areas below the ordinary high water level of the river. The water level of the project area is controlled by the standing Lake Superior water level, which currently is higher than normal, at 602.6 feet elevation. The project construction design water datum is 601.1 feet. The project is not within a Minnesota Department of Health (MDH) wellhead protection area.

The MDH Minnesota County Well Index was used for identifying on-site and nearby wells. No wells have been identified in the Kingsbury Bay Project Area. One well is mapped near the north boundary of the Grassy Point Project Area (No. 595493) and described as a 17-foot deep monitoring well. A 23-foot extraction well (No. 273804) is located about one-half mile from the Grassy Point project area. Another well is located near the railroad on the Grassy Point Project area boundary. It has been capped and is no longer in use. Numerous other wells, nearly all groundwater monitoring wells, are located in the vicinity of Grassy Point further north of site and on the SLRIDT site west of site. The County Well Index identified two wells that occur in the project area, on the XIK Dock #7 (Figure 10). The dock will be used for project operations and as a staging area for storage of materials. The well located at the south end of the dock (No 332007) has been sealed. According to the scanned map included with the MDH well data, the well shown to be located on the north end of the dock (No. 595507) is not mapped properly. Records show the well has also been sealed.

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. below.

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.
   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.
   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.

The hydraulically dredged materials will be moved by pipeline or barge from Kingsbury Bay to Grassy Point and immediately applied on the riverbed using a baffled outlet to reduce the degree of turbidity. Construction and maintenance activities associated with the slurry pipeline will result in some damage to marsh vegetation located within the pipeline corridor. The transport of pump equipment and the placement of the booster pumps will damage small areas of the marsh. Laying the slurry pipeline directly on emergent marsh will smother vegetation and compress some marsh soils. Sediments may spill from leaky joints, pipeline breakages or near the discharge points. Coarse materials may accumulate at these points, resulting in pockets of higher elevation.

The pipeline corridor will be placed strategically in shallow nearshore habitats to avoid obstructing navigation. During the installation, maintenance, and disassembly of the pipeline, care will be taken to avoid disturbing marsh habitats. The pipeline system's proposed location allows easy access for monitoring. The contractor will have on-site personnel monitoring the pipeline path and booster pumps when in operation to ensure the system is functioning properly. There is a low risk of environmental contamination or damage from the installation, operation, or removal of the slurry pipe and associated booster pumps.

The materials moved by barge will be loaded with an excavator. If slurry materials need to be settled and solidified, the carrier water (wastewater) will be drained back into the St. Louis River. Water quality of the wastewater will be sampled and analyzed according to state 401 Certification permit conditions prior to its release. The risk of the carrier water from Kingsbury Bay being containing chemical pollutants is low as sediments have had limited exposure to contaminants. The need for chemical water quality analysis will be evaluated during the permitting process.

The current Project design plans to beneficially reuse all excavated wood waste materials in the construction of RSUs 2 and 3. Should excess wood waste be encountered and be reused as biofuel, the wood waste would require storage and dewatering. Wastewater might be generated by gravity drainage from excavated wood waste materials stored and managed on XIK Dock 7. To be suitable as a fuel source, the wood waste must be dewatered on the dock prior to transport. In order to estimate the quality of elutriate produced during dewatering, pore water samples have been collected and analyzed. Results will inform the development of applicable wastewater discharge permits (CWA Sections 401 and 404, NPDES/SDS Construction Stormwater, and Public Waters Work). Wastewater generated by the dewatering process will be handled and treated using BMPs appropriate to permit conditions.

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.

The St. Louis River, the largest U.S. tributary to Lake Superior, drains 3,634 square miles, entering the southwestern corner of the lake between Duluth, MN and Superior, Wisconsin (Lake Superior Streams 2009). Red clay deposits, partially covering many of the urban watersheds, are a contributing factor to sedimentation occurring in the St. Louis River Bay. As the river approaches Duluth and Superior it takes on the characteristics of a 12,000 acre (4856 hectare) freshwater estuary. While the upper part of the estuary has some wilderness-like qualities, the lower portion is decidedly urban (Lake Superior Streams 2009).

Urbanization and rural development are placing increased pressure on Duluth's streams, and in particular, on its 12 designated trout streams. Fish, amphibians, and invertebrates are impacted by increased temperature, excess turbidity and suspended sediment, road salts, organic matter, and nutrients. Further, these streams discharge directly into ultraoligotrophic L. Superior, or indirectly via the St. Louis River-Duluth Superior Harbor, part of the AOC. Cities in the Duluth area are increasing emphasis in reducing sedimentation by improving surface water management.

Rock construction entrances, timber work platforms, floating silt curtains, and other standard BMPs will minimize water quality impacts associated with this work. Although work might include minor landside excavation, most dredging will be from aquatic areas and will occur in both winter and summer.

Project construction activities will mainly occur within the public water. Several activities will occur in uplands or on shoreland: some construction and use of access points and roads, establishment and maintenance of material and equipment staging areas and office facilities located at the XIK dock; loading and unloading of materials in storage areas (XIK dock) and potentially other upland areas nearby or on-site; stationary equipment such as pump stations; trucks entering and exiting the site and along haul routes between sites; settling of materials for the construction of waste containment islands; and possibly others.

The immediate receiving water is the St. Louis River and the downstream receiving water is Lake Superior. Each of the access points, storage areas, equipment maintenance/holding area, shoreline edges, could generate stormwater discharges to the St. Louis River. Stormwater discharges could carry sediment and incidental fuel and hydraulic fluid leaks/spills from these areas.

The MNDNR will obtain an NPDES/State Disposal System (SDS) Construction Stormwater General permit. The MNDNR, together with the construction contractor, will prepare a Stormwater Pollution Prevention Plan (SWPPP) to address the BMPs necessary to manage, control, and/or treat stormwater runoff before it enters the St. Louis River and/or nearby creeks. The SWPPP will include the identification of these areas and the proposed control structures needed to manage stormwater runoff, including engineering designs for these structures in the construction plans. Most of the structures will be temporarily needed during the active construction period. Other access points, restored and destabilized shoreland zones might require control treatment be used for several months to several years after construction ends. Following completion of the Project, the MNDNR must remove all temporary structures and unused materials. The MNDNR must also restore

temporary sites to their original condition, using accepted standard practices for site restoration upon completion of activities.

The NPDES/SDS Construction Stormwater permit defines special waters and additional BMP requirements to be used on projects draining to a discharge point on the project that is within 2,000 feet of a special water and flows to that special water. These requirements are contained within Appendix A of the NPDES/SDS permit.

The XIK Dock 7 site will be prepared with perimeter erosion and sediment controls. Containment berms will be placed around storage sites used for settling and dewatering materials. Temporary seeding and erosion control blanket will be placed on the berms (including side slopes) to stabilize the soils and reduce erosion and sedimentation. Chip bags and/or rock logs can be used to control areas where vegetation may not be adequate (i.e. access roads).

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.

No water appropriation is currently proposed as part of the project. Dewatering might occur if hydraulically dredged materials are solidified prior to their application as fill for capping wood waste zones, islands or other substrates to establish aquatic vegetation. However, the water will reenter the same waterbody as it originates and therefore is not classified by Minnesota Rules as dewatering. During Keene Creek restoration, water will be pumped from the main channel to another location in the wetland/bay area while operations occur within the channel area. The dewatering is considered wastewater which is described under Item 11.b.i. Techniques and BMPs for transporting water between areas of the St. Louis River Estuary will be coordinated with the MNDNR hydrologist.

iv. Surface Waters

a) 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.

Wetland types are defined in accordance with the Wetlands of the United States (1956 and 1971): freshwater meadows (Type 2), shallow fresh marshes (Type 3), open fresh water, less than ten feet deep (Type 5), shrub swamp (Type 6), wooded swamps (Type 7), and bog (Type 8) (Figures 11A and 11B). The proposed construction zone is below the ordinary high water level (602.8 ft IGLD85).

Kingsbury Bay is the primary depositional zone for Kingsbury Creek, a clay and bedrock-influenced tributary to the St. Louis River Estuary in Duluth, Minnesota (Figure 4). Anthropogenic impacts within

the Kingsbury Creek watershed have resulted in increased sediment transport to Kingsbury Bay over the past 60 years. Deposition of this increased sediment load has reduced the overall aquatic sheltered bay habitat/wetland (Type 5) by 11 acres (Figure 5). Efforts are presently underway under separate project development within the watershed to minimize the transport of sediment moving down the watershed to the estuary.

Additionally, the sheltered bay complex at Kingsbury Bay extends around Indian Point to the Tallas Island area and includes the sheltered aquatic habitat between the island and Indian Point. Sediments originating from the Kingsbury Bay watershed have also shallowed this area. Water depth in front of the Indian Point Campground has been reduced and vegetative growth of mostly invasive cattails is threatening conversion of nearshore areas to an emergent marsh.

Kingsbury Creek operations involve excavation within shallow marsh (Type 3), open water marsh (Type 5) and wooded swamp (Type 7) wetlands. Type 3 and Type 7 wetlands are dominated by narrow-leaved cattail, an invasive species. Type 3 and 5 shallow and open-water (0 – 6 feet deep) wetland habitats will be developed. The goal of the proposed excavation is to promote the development of a coastal marsh ecosystem and support a healthy and diverse native aquatic plant community. Promoting shallow sheltered habitat that fosters aquatic vegetation will encourage wetland expansion, as sediments are removed and bathymetry of the area is rectified. Wild rice plantings will also be implemented over a portion of the dredged area at Kingsbury Bay (proposed plantings included under separate project).

Grassy Point operations involve the excavation of: anthropogenic wood waste, spoil (sand historically dredged and placed in Grassy Point wetlands), excess fine/organic sediments, and areas of non-native, invasive cattail and *Phragmites*. Shrub and wooded swamp (Types 6 and 7), shallow marsh (Type 3) and open-water wetland (Type 5) and non-vegetated open water (unconsolidated river bottom) will be excavated. Material excavated from Kingsbury Bay will be reused to cap excavated zones (and some unexcavated ones) to achieve desired ecological outcomes at Grassy Point. Excavation and subsequent placement of fertile material from Kingsbury Bay is intended to develop a stable coastal marsh ecosystem of healthy and diverse native aquatic plant communities (shallow marsh and open-water wetlands). Efficient containment of wood waste will be partially accomplished by constructing islands over areas of deep wood deposits that are now capped with invasive cattail and *Phragmites* or classified as unconsolidated river bottom. The island will include a baymouth bar extension configured to partially protect a shallow sheltered bay, cover deep wood deposits, and bury derelict structures and numerous pilings that currently pose a safety hazard to recreational users.

The table below lists the habitat types altered by construction and proposed acreage after construction. Unaltered areas of the project are also included. Type 3 wetland dominated by invasive cattails will be converted to Type 5 wetland, resulting in an overall increase in Type 5 wetland at Kingsbury Bay. No net wetland change is proposed at Kingsbury Bay. A net increase in wetland area is proposed in the Grassy Point Project Area (from 69 acres to 81 acres), even with a 10-acre reduction due to RSU 2 islands construction to contain detrimental wood waste materials. This is facilitated by converting shallow Type 3 wetland dominated by wood waste and/or invasive monocultures to Type 5 wetland and reestablishing wetland on non-vegetated unconsolidated river bottom (open water). The MNDNR does not anticipate environmental effects or alterations to wetland features that lie along the shoreline above the ordinary high water level. If wetland improvement is necessary to prevent erosion of on shore wetlands during Project construction, the

MNDNR might seek to improve and restore the quality and function of some of ancillary wetlands (not included in table) and will first acquire authorization before wetland work commences.

Project Area	Wetland Type	Restoration Project Area		
		Before (Acres)	After (Ac.)	Change (Ac.)
Kingsbury Bay	Shallow Marsh (A)[1]	15	0	-15
	Deep Marsh (A)	48	64	+16
	Wetland Scrub/Shrub (A)	1	0	-1
	Marsh and Wetland Scrub (U)[1]	16	16	---
	TOTAL	**80**	**80**	
Grassy Point	Bog and Shallow Marsh[2]	21	18	-3
	Shallow Marsh[2]	9	0	-9
	Deep Marsh[2]	12	45	+33
	Bog and Scrub Shrub[2]	27	18	-9
	Wetland (A & U)	**69**	**81**	**+12**
	Wetland (A)	52	64	+12
	Open Water (A)	30	0	-30
	Upland (A)	0	18	+18
	Wetland (U)	17	17	---
	Open Water (U)	47	47	---
	Scrub/Impervious (U)	14	14	---
	TOTAL	**160**	**160**	
	[1] The terms (A) "altered" refers to potential construction zone and (U) "unaltered" to project acreage left undisturbed; [2] Wetland acreage for project area.			

Changes to Wetlands

The Project is being designed to restore, create and enhance Great Lakes coastal marsh ecosystems. The proposed objective is "wetland conversion," e.g., changing existing impaired and/or undesirable wetland types to naturalized wetlands. The proposed increase in wetland area is referred to as "wetland creation." Some areas where wastes will be contained in island features will experience "wetland removal." Regrowth of aquatic vegetation within some areas of converted and created wetlands will be augmented with placement of biological medium. All areas will require several years of recovery after dredging to achieve a restored condition. Restoration targets for specific depth ranges are based on aquatic vegetation community types and commonly observed species groupings within comparable reference habitats in the estuary. A monitoring and management program (see Item 6b) is being designed to ensure restoration areas will trend towards desired conditions. Monitoring data from a similar past restoration effort at Tallas Island supports our thesis that aquatic vegetation will recovery a few years after project completion (see EAW Item 13). Coordination with wetland permitting authorities to assure the conditions for wetland conservation are met will continue.

Wetland Conversion. Proposed objectives at Kingsbury Bay and Grassy Point include the conversion of existing emergent wetlands dominated by wood waste and/or exotic monocultures to open water

wetlands with bathymetries that will support native community types and groupings identified in Table 2 (Figure 11C). Objectives in these areas will result in the establishment of approximately 34 acres of desirable native aquatic vegetation; the acreage includes the loss of wetlands due to island construction. Non-native plants and wood waste will be excavated, and in many areas will be capped with clean organic material.

Table 2. Aquatic vegetation community types and commonly observed species

SPARSE SUBMERGED MACROPHYTE BED *Depth Range = 0.30 to 1.80 m (0.98 to 5.91 ft)*

Scientific name	Common name	Lifeform	Frequency
green algae - filamentous	green algae	suspended	74.4
Characeae (Chara or Nitella)	stoneworts, macroalgae	submerged	25.6

MIXED MACROPHYTE BED *Depth Range = 0.45 to 1.72 m (1.48 to 5.64 ft)*

Scientific name	Common name	Lifeform	Frequency
Ceratophyllum demersum	common coontail	suspended	63.6
Nymphaea odorata	American white waterlily	floating-leaf	49.1
Elodea canadensis	Canadian elodea	submerged	42.7
Vallisneria americana	water celery	submerged	40.0
Myriophyllum sibiricum	northern water milfoil	submerged	38.2
Nuphar variegata	yellow waterlily	floating-leaf	36.4
Najas flexilis	bushy pondweed	submerged	32.7
green algae - filamentous	green algae	suspended	27.3

FLOATING/SUBMERGED MACROPHYTES *Depth Range = 0.55 to 2.55 m (1.80 to 8.37 ft)*

Scientific name	Common name	Lifeform	Frequency
Vallisneria americana	water celery	submerged	89.0
Nymphaea odorata	American white waterlily	floating-leaf	31.5
Potamogeton richardsonii	clasping leaf pondweed	submerged	28.3
other green algae or cyanobacteria	green algae or cyanobacteria	suspended	25.2

ARROWHEAD/BULRUSH/BUR-REED MARSH *Depth Range = 0.10 to 1.40 m (0.33 to 4.59 ft)*

Scientific name	Common name	Lifeform	Frequency
Sagittaria latifolia	broad-leaved arrowhead	emergent	51.7
Schoenoplectus tabernaemontani	soft stem bulrush	emergent	48.3
Sparganium eurycarpum	giant bur-reed	emergent	41.4
Najas flexilis	bushy pondweed	submerged	31.0
Vallisneria americana	water celery	submerged	31.0
Ricciocarpos natans	purple-fringed riccia	free-floating	27.6

CATTAIL/SEDGE/ARROWHEAD MARSH *Depth Range = 0.12 to 0.70 m (0.39 to 2.30 ft)*

Scientific name	Common name	Lifeform	Frequency
Typha X glauca	hybrid cattail	emergent	64.0

Carex lacustris	lake sedge	emergent	48.0
Sagittaria latifolia	broad-leaved arrowhead	emergent	40.0
Lythrum salicaria	purple loosestrife	emergent	32.0
Potentilla palustris	marsh cinquefoil	emergent	32.0
Sparganium eurycarpum	giant bur-reed	emergent	32.0
Equisetum fluviatile	water horsetail	emergent	28.0

Wetland Creation. No new wetland acres will be created at Kingsbury Bay. At Grassy Point, approximately 22 acres of open water wetland will be created (Figure 11C). Adjusting bathymetry is designed to create depths supportive of desired plant communities listed in Table 2. The constructed baymouth bar is designed to limit exposure to wind and wave energy, creating a sheltered bay that will support the growth of naturalized beds of native aquatic vegetation.

Wetland Removal. No wetland acres will be removed at Kingsbury Bay. At Grassy Point, approximately 10 acres of shallow wetlands dominated by legacy wood waste and invasive cattail or *Phragmites* will be removed and replaced with upland islands (Figure 11C). Upland islands will be planted to a mix of terrestrial plants. The constructed upland islands will partially protect the shallow bay, increasing the likelihood of reestablishing aquatic plant communities identified in Table 2.

Alternatives Analysis

The Project has been designed to remediate the degradations described above under "Purpose and Need" through the achievement of stated purposes and objectives. Project elements have been vetted through a multi-year design process involving a team of resource professionals and two contracted design-engineering teams. These measures replicate an extended "alternatives analysis" and have been undertaken to ensure that desired long-term aquatic resource impacts are achieved and undesirable short- and long-term impacts are avoided.

Restoration project alternatives each have a set and degree of environmental effects on the aquatic resources meant to be restored, enhanced, or created. Wetland restoration projects that show sufficient evidence of success are given consideration if positive outcomes have a high probability to outweigh the potential negative impacts that temporarily occur during construction and those that could be long term. The alternatives discussed below were developed to minimize impacts using onsite methods and designs. A more detailed discussion of alternatives is available in the Project's Joint Application Form for Activities Affecting Water Resources in Minnesota. This application is associated with the CWA Section 401 Water Quality Certification, the Section 404 Clean Water Act permit, and the Section 10 Rivers and Harbors Act permits.

The following alternative was assessed for both the Kingsbury Bay and Grassy Point Project areas:

- *Alternative #0 No Action Alternative:* Under this alternative, designated uses will continue to be met at existing levels and water quality will remain unchanged.

The following alternatives were developed for the Grassy Point Project area to address concerns regarding potential post-project benthic communities.

- *Alternative #1 - Preliminary Design*: The restoration footprint at Grassy Point would exclude the rectangular bay area designated as RSU 10.1.

- *Alternative #2 - RSU 10.1 Biomedium:* Add a six-inch layer of biomedium to remediate areas in RSU 10.1 measured to have below-average benthic community scores (as measured by the tri-metric index, or TMI). Following evaluation of this alternative it was selected as the preferred alternative.
- *Alternative #3 - Reduce RSU 7 Footprint:* The restoration footprint at Grassy Point would be altered to selectively avoid areas in RSU 7 measured to have above-average populations of benthic macroinvertebrates (as measured by TMI).
- *Alternative #4 - Reduce RSU 7 Footprint and Reconfigure RSU 3:* In addition to footprint changes associated with Alternative #3, the baymouth bar footprint would be altered to selectively avoid areas in RSU 3 measured to have above-average populations of benthic macroinvertebrates (as measured by TMI)

The following alternative was developed for the Kingsbury Bay Project area to address concerns raised by stakeholders that select higher-quality vegetation be preserved.

- *Alternative #5 – Reconfiguration of RSUs 1 and 4:* The excavation area of RSU 1 would be reduced to avoid desirable terrestrial vegetation. The eastern boundary of RSU 4 would be reconfigured to selectively avoid high-quality submerged aquatic vegetation beds. A 20-foot channel would be added to maintain recreational access to adjacent landowners. Following evaluation of this alternative it was selected as the preferred alternative.

b) 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.

The project is designed to restore 240 acres of fish and wildlife habitat at two locations within the Lower St. Louis River Estuary by removing legacy wood waste and deposited sediment. The Project will restore and enhance estuary wetlands and connectivity to contributing creeks. Recovery of aquatic vegetation after construction is completed will take several years of reestablishment on the dredged/filled portions of the riverbed. Cover values provided under Item 7 above describe only open water cover values where dredging has occurred.

Shallow sheltered bay habitat will be created and enhanced through excavation of approximately 173,000 CY of wood waste and wood-sediment mixes at Grassy Point, a 160-acre impaired wetland complex. Subsurface surveys have been used to plan proposed dredge depths and bottom contours of the site (Barr 2013). Clean material excavated from Kingsbury Bay will be transported to Grassy Point for beneficial reuse for capping dredged areas to provide improved growth medium. Where large volumes of wood waste are removed, clean fill will be placed on the channel bottom to establish desirable bathymetry for marsh vegetation and further isolate remaining sediment contamination.

The proposed upland features (islands) at Grassy Point will be constructed over deep deposits of wood waste that have a partial covering of invasive cattail and *Phragmites* marsh vegetation. To create a capacity for receiving the wood wastes, berms will be established along the perimeter of the proposed islands. Wood waste will be brought in from nearby deposits and added to the island feature to a level of approximately three or more feet to have a capacity to contain a sufficient volume of wood waste. Additional clean organic and mineral sediments will cap the island to improve stability and fertility beneficial for establishing woody vegetation.

Island formation will result in a loss of approximately 10 acres aquatic habitat (Figure 11C). Creating new islands will also destroy benthic organisms in the fill area, where some benthic communities have been ranked in good-excellent condition and are considered unimpaired. The MNDNR proposes to balance the loss of wetlands due to island creation by creating additional aquatic vegetation in areas heretofore not supporting aquatic vegetation. The proposed islands will partially protect the Grassy Point shallow sheltered bay habitat in the estuary and improve conditions for establishing aquatic vegetation.

A wind exposed shoreline segment (RSU 13), currently a hardened railroad grade and abandoned ship lane, forms the north boundary of the Grassy Point site. The shoreline along the railroad will be enhanced by shallowing and softening the nearshore areas with an application of organic and mineral sediments. Aquatic marsh vegetation is likely to reestablish on the improved habitat.

Lower Keene Creek, which drains into the Grassy Point area, has a 5-acre, 1,000 foot section of creek that is hydrologically controlled by the water level of the estuary (RSU 11). This creek section has been negatively impacted by channelization. Construction would remove deposited berm materials to the static level of the marsh, reestablish a more functional stream channel by dredging, and reconnect adjacent emergent wetlands that have been isolated from the estuary. No construction work will occur on the creek channel above the OHWL.

The MNDNR discusses the Project's direct and indirect environmental effects to surface waters, together with the BMPs employed to minimize environmental effects, in the following three sections. The first section relates to the water quality impacts from dredging in Kingsbury Bay and Grassy Point. The second section relates to the water quality effects from the placement of dredged material into the Project Site. The third section describes BMPs the MNDNR will use to minimize environmental effects.

Impacts from Excavation of Dredged Material. Sand and fine sediments (some high in organic matter) will be excavated from Kingsbury Bay, then transport and placed on top of the recently dredged areas in the Project Site to enhance the growth of aquatic vegetation. The short-term water quality impact to each of these areas includes turbidity in the water column. The MNDNR will minimize these impacts by employing in-water BMPs such as use of a silt curtain at the dredge location and spill containment at transfer points. The MNDNR will remove materials from the Kingsbury Bay under the same or separate public waters permit application as developed for Grassy Point. Sediments obtained from Grassy Point will be repositioned from congested channel habitats, areas reworked to decrease cover of invasive species, and other habitat conversion areas to provide other areas where fill is needed to achieve desirable bathymetry.

Dredging to obtain material from Kingsbury Bay and Grassy Point may create temporary and localized impacts, such as short-term increases in turbidity in the water column due to sediment disturbance at the location where the material is dredged. The proposed dredge areas will result in

the loss of existing native and invasive aquatic vegetation. It is anticipated that submergent vegetation will reestablish to depths of about 8 feet, where lack of light generally restricts growth.

In-water work (below the OHWL) includes all dredging operations of St. Louis River Bay and beyond the shoreline areas. Inherent in the operation of diesel and gasoline-powered machinery are risks associated to equipment failure such as hydraulic line breakage or leaks from faulty connections. Examples of structures in-water are mooring facilities, dolphin structures, floating platforms, pump stations, buoys, and turnarounds.

Impacts from Placing Dredged Material into the Project Site. The Project will use dredged material suitable for in-water placement to create variable water depths that will encourage the growth of diverse aquatic vegetation and a healthy benthic macroinvertebrate community. The placement of dredged material in the Project Site will result in short-term turbidity in the water column. The hydraulic placement of dredged material will result in increased concentrations of suspended solids during and immediately after placement operations, and although the water column oxygen concentration is temporarily reduced, the impact is limited to a short period of time at the construction site. Dredged materials with a finer texture, such as those present in the open water portions of Kingsbury Bay, may create higher concentrations of suspended sediments that require longer to settle. These impacts will occur both within the construction area, where the MNDNR will place the dredged material, and outside of the construction zone, depending on water flow velocity and direction.

BMPs to Mitigate Impacts on Dredge Placement Areas. Turbidity will be monitored on-site and adjustments will be made if suspended sediment levels are above permit requirements. In the short term, the MNDNR will use appropriate BMPs to minimize the amount of suspended solids in the water during construction. Silt curtains will be implemented as required by permitting authorities. Previous turbidity monitoring at the 21st Avenue West site during the pilot study of dredge material placement and a sediment transport model (Hayter et al. 2015) indicate the material will not migrate from the placement areas in the long term. The MNDNR does not expect significant risks to aquatic life outside of the placement site. Data and analysis from 2013, 2014, and 2015 by the USACE and U.S. Geological Survey (USGS) during the Pilot Project work at 21st Avenue West showed turbidity rapidly decreased with distance from the placement area, and approaches background levels at approximately 1,000 feet (USACE, 2016c). In addition, water quality returns to normal within the construction site within two days after placement of dredged material. Dredging and fill operations will be monitored to determine whether similar results occur in construction zones at Kingsbury Bay and Grassy Point.

To help minimize temporary impacts to the fishery, state and federal agency permits require that restoration work will not occur during spawning periods (from April 1st to July 1st). For these reasons, the Project will not create long-term contaminant releases or adverse effects on the fishery. In addition, the Project will help reduce exposure of contaminants in the sediment to the food web. The USACE and USGS monitoring at 21st Avenue West demonstrated that the use of appropriate in-water BMPs helped reduce the total amount of turbidity within the 21st Avenue West project area. Similar BMPs will be applied to the Kingsbury Bay – Grassy Point Project Area.

The CWA Section 401 Water Quality Certification, the Section 404 Clean Water Act permit, the Section 10 Rivers and Harbors Act Permit, and the Public Waters Work Permit include BMPs designed to prevent adverse effects on water quality due to dredging operations by minimizing the amount of sediment resulting from dredging. Any dredged material that does not show significant

toxicity to test organisms under the methodologies and analysis of Section 404(b)(1) and Minnesota Rules 7050 will be documented for beneficial use as in-water placement. Sediment samples from Kingsbury have indicated minimal contamination and will likely be permitted for beneficial use as in-water placement. At Grassy Point, toxicity testing of additional sampling (to be completed) will be conducted for samples taken around four of the 24 sample points that exhibited contamination levels greater than Level II SQT.

The MNDNR will use BMPs where practicable or required, to mitigate and reduce the Project's potential water quality impacts, as described below. The MPCA tested several of these for efficiency at reducing turbidity during the Pilot Project at 21st Avenue West, as required by the MPCA's 401 Water Quality Certification (401 Certification). The MNDNR, MPCA, and the USACE may deem it necessary to explore other methods to minimize short-term turbidity impacts or require the use of additional placement methods and BMPs not listed below.

1. The MNDNR will not place any dredge material in the Project Site before July 1 of each construction year unless the MNDNR grants permission under the authority of the Minnesota Public Waters Permit.

2. Visual Inspection: The MNDNR will visually monitor and observe turbidity levels, weather, and wave conditions when placing the dredged material to ensure that all BMPs are effective and used in a manner that minimizes turbidity. If the MNDNR determines that turbidity at the water surface seems elevated beyond anticipated levels, or if the MNDNR receives formal complaints, the MNDNR will monitor turbidity levels in accordance with MPCA's 401 Certification. If monitoring demonstrates that turbidity caused by the dredged materials placement activities is a concern (e.g., elevated total suspended solids beyond anticipated levels outside of the Project Site, but not upstream of it) the USACE will work with the MNDNR under the authority of the 401 Certification to solve the issue.

3. Turbidity/Silt Curtain: The MNDNR will install a turbidity/silt curtain where appropriate before the placement of any dredge material.

4. Minimize Pump Operation: The MNDNR will only operate the pumps, which transport dredged material from the offload site to the placement area, at full capacity when the material is placed. The MNDNR will not leave the pumps running at full capacity while waiting for dredge materials to arrive.

5. Limited Vessel Traffic over Placed Material: The MNDNR will minimize vessel traffic over the recently placed dredge material at the Project Site.

6. Apron/Spill Controls: The MNDNR will use an apron/guard to prevent dredged material from spilling into the water while transferred from the barge to the pump.

7. Mechanical Placement of Dredged Materials: The MNDNR will use mechanical placement of dredged materials when possible. Mechanical placement causes far less turbidity relative to hydraulic placement.

8. Hydraulic Placement of Dredged Materials: Where it is too difficult to place materials mechanically, the MNDNR will use piping to hydraulically control the discharge rate at the end of the pipeline by implementing the most appropriate BMPs on the equipment (e.g., pipe diameter, discharge location, diffuser, and baffle plates).

The in-water Best Management Practices (BMPs) must be properly installed prior to conducting the authorized activities and must be maintained throughout the duration of the project's in-water disturbances. While conducting the work, the BMPs must also be visually monitored to ensure management of turbidity and/or sedimentation. If turbidity and/or sedimentation caused by the project, is observed outside and downstream of the defined work area, then the authorized activities must cease immediately until alternative BMPs, which will adequately control turbidity and sedimentation, have been implemented. In-water BMPs must be included in the construction plan. Further information regarding the types of BMPs that may be suitable for this purpose can be found in "Best Practices for Meeting DNR General Public Waters Work Permit GP 2004-0001" manual provided on the DNR web site.

Surface Water Use

The Kingsbury Bay and Grassy Point Project areas are currently inaccessible to watercraft with the exception of canoes and kayaks. Recreational boat use in Kingsbury Bay is currently limited due to its shallow nature but is present in adjacent areas. Recreational boat use in the Grassy Point area is limited due to its shallow nature and accumulated wood waste but is present in adjacent areas. A navigation channel lies outside Kingsbury Bay-Grassy Point project area.

Project-related activities will occur outside of the main navigation channel. To transport dredged materials during project operations, it will be necessary to site stationary equipment such as floating pipe sections and pumps along the edge of the main channel of the St. Louis River (Figures 2 and 3). The pipeline will be placed along the shoreline in open water to avoid commercial and recreational boating conflicts and damage to nearshore vegetation. The pipeline will remain buoyant and visible on the water surface but can be sunk if necessary.

The assembly and operation of the pipeline may interfere with recreational boating. To minimize potential conflicts with boaters, the pipeline will be positioned near the shoreline. Boater safety will be enhanced by clearly marking the pipeline with buoys and signage, providing lighted warning of the equipment obstruction. The MNDNR public waters work permit authorizing the pipeline system will include a provision requiring that the pipeline will not obstruct navigation or create a water safety hazard, according to Minnesota Rules, part 6115.0210, subpart 3A.

The desired future condition of the open water of the project area after construction is shallow sheltered bay habitat. These areas will be most accessible by canoe or small boats and recreational fishing will be allowed. Establishing more open water and greater diversity in depth will enhance the area for recreational fishing and boating as well as establish the opportunity for public access to aquatic resources across City of Duluth parkland. The project is not providing any facilities or resources to directly facilitate watercraft use, such as a marina or boat docks, but increased depths and vegetation-free access channels are expected to increase recreational use within the Project areas.

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.

The MPCA and USACE conducted preliminary sampling several years ago to determine sediment contaminant levels within the Kingsbury Bay and Grassy Point sites. Preliminary sediment contamination was measured at a few locations at Kingsbury Bay and 24 locations at Grassy Point. The USACE conducted additional sampling at both sites during the summer of 2017 to target specific areas and address specific concerns relating to management of the dredged materials. The additional sampling at Kingsbury Bay was conducted to verify whether materials are safe for beneficial reuse as biomedium at Grassy Point. Results of that sampling were combined with existing data to inform the final design, permitting and environmental review (Attachment E, available upon request). Additional analysis of wood waste contamination, e.g., primarily how to permit and safely manage effluent water from wood waste stockpiles, is in progress. Wood waste is proposed to be stockpiled and dried on the XIK Dock #7 and later transported to Hibbard power plant to be used as a fuel source.

The preliminary sampling at Grassy Point identified lead, polycyclic aromatic hydrocarbons (PAHs), and dioxin/furans contaminants. Most samples taken there showed contaminant levels above Sediment Quality Target (SQT) Level I. Four locations contained chemicals with concentrations higher than SQT Level II (Figure 7), (LimnoTech 2013). Level II concentrations indicate potential biological harm. As described by MPCA (MPCA 2015c), when concentrations exceed SQT Level II restoration areas are subject to the following best management practices:

- Better define the extent and magnitude of chemical concentrations through supplemental sampling;
- Perform bioassays (acute/chronic) to ensure acceptable risk of exposure and uptake by test organisms; and
- Finalize decision to remediate, avoid, or cover with appropriate medium to increase the long-term effectiveness of habitat restoration efforts.

Preliminary sampling at Kingsbury Bay revealed no sediment sampling points above SQT Level II.

Additional sampling at and around the four SQT Level II exceedance points was completed in June of 2017 by the USACE. Sediments were analyzed for a suite of chemical and physical characteristics. In addition, a risk assessment of sediment toxicity on human health and the environment was conducted. The risk assessment will apply an analysis of data based on the Minnesota guidelines for the SLRAOC Quality Assurance Program Plan (QAPrP) and Federal Section 404 guidelines. Fundamental to these guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it is demonstrated that such a discharge will not have an adverse impact on the aquatic ecosystem. Specifically, sediments excavated as part of restoration activities should be handled in a manner consistent with guidelines for the re-use of navigational dredge materials.

Grassy Point samples have sediment contaminant levels that are almost entirely higher than the Kingsbury Bay samples. Placing clean sediments over contaminated layers will further isolate the latent contamination, reduce benthic organisms' exposure and limit the food chain from passing contaminants to higher level animals.

No effects on aquatic organisms was indicated from the toxicity test conducted at the four sites. The study indicated that remediation of sediment associated with four locations is not warranted.

Two areas adjacent to Grassy Point showed elevated levels of contamination: the SLRIDT Superfund site and the Ponds behind Erie Pier site. The SLRIDT site, located just west of the XIK Dock #7, consisted of 94 acres of aquatic habitat where sediments were contaminated primarily with PAHs, volatile organic compounds (VOCs), and cyanide. The remediation has been completed at the site, Measures taken to remediate the site included dredging, capping sediments in place, and burying sediments in place with an aquatic disposal containment area. Ongoing monitoring to evaluate success of hazardous waste containment and site restoration is ongoing. The MPCA has conducted sampling at the Ponds behind Erie Pier near the Grassy Point site. The analysis indicated this site had contaminant concentrations that are not safe to human health and the environment. Therefore, under the restoration work of the AOC, the Ponds are designated as a contaminated sediment cleanup site. The MPCA Remediation Division is currently conducting a feasibility study for this work.

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 proposed Project is not expected to generate significant amounts of solid waste. The contractor will be responsible for hauling any construction-generated wastes off site to appropriate solid waste management facilities. Should unanticipated materials be encountered during construction activity, they will be evaluated and the contractor will be responsible for proper disposal, including hauling off-site to an appropriate solid waste management facility if required. Wood waste that meets specifications as a fuel source will be used at the Hibbard Power Plant. Other wood waste-sediment mixes at Grassy Point will be removed from the river bottom and isolated from aquatic areas by reusing it in island construction.

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.

No hazardous materials will be permanently stored on-site. Hazardous materials may be stored on- site during specific construction activities. If on-site, hazardous materials will be stored in a designated area at least 100 feet from water or drainage ways. Hazardous material storage on-site will require secondary containment, signage, and preventive maintenance inspections. Spill kits will be stored near any hazardous materials. Vehicle maintenance will only be allowed in designated areas. Hazardous materials may be stored on barges during in-water construction work. Secondary containment, routine preventive maintenance inspections, and spill kits will be required.

Pollution prevention measures, including the management, storage and disposal of hazardous waste, must be in compliance with MPCA regulations and liquid and solid wastes must also be disposed of properly and in compliance with these regulations. When completing the stormwater

pollution prevention plan (SWPPP), measures used for pollution prevention must be stipulated in the plan. The contractor(s) will also be required to develop a Spill Prevention and Response Plan for all hazardous materials and activities under their control.

Construction equipment will require fuel (diesel and/or gasoline) and oils (lubricating and hydraulic). The MNDNR's contractors will comply with U.S. Coast Guard, and Wisconsin and Minnesota Department of Transportation regulations as applicable to marine work, construction activities, and truck transport for handling of fuels and oils. The Proposer will require special measures to prevent chemicals, fuels, oils, greases, and other pollutants from entering the waterway. The MNDNR will have a Contaminant Prevention Plan and a Spill Control Plan in the event of an unforeseen spill of a substance regulated by the Emergency Response and Community Right-to-Know Act or regulated under state or local laws or regulations. The contractor will report all spills immediately to the MNDNR Project Manager and any reportable quantities to the legally required federal, state, and local reporting channels. Spill kits to contain and/or neutralize accidental minor discharges are required on-site.

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.

Project operations will not generate hazardous wastes.

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.

Lake Superior coastal marsh systems are emergent marshes in estuaries, found near river mouths along the shore of Lake Superior and influenced by cyclic wind-driven changes in lake level, or seiche. Coastal marsh systems are typified by a variable mixture of vegetation species, typically with a dense layer of submerged plants under and between floating-leaved and emergent aquatic plants. Coastal marsh wetlands in Lake Superior are critical habitat for fish spawning, rearing and feeding areas. Seiches flush coastal wetlands with water, increasing oxygen levels, which positively influences the composition of the biologic community of these backwater areas.

Aquatic areas of Kingsbury Bay and Grassy Point are classified as freshwater estuaries. The wetlands formed where the St. Louis River enters Lake Superior, in the zone of transition from stream to lake within which water level, sedimentation, erosion, and biological processes are controlled by fluctuations of the lake levels caused by seiches. These wetlands in the transition zone play a large role in the biological productivity of the Lake. For example, Lake Superior coastal wetlands are about twenty four times more productive than the open water areas, and the St. Louis River is a major spawning river and nursery for the Lake's warm water fishery (LSRI 2010).

The Project site is located near the mouth of the St. Louis River Estuary (SLRE), which serves as the entrance to a 12,000 acre freshwater estuary; the largest in the Great Lakes. This estuary is home to fisheries and bird habitats along with many wetland plants. At Kingsbury Bay, excessive sedimentation has resulted in poorer-quality emergent habitat dominated by narrow-leaved cattail and a shallower overall bathymetry which provides less diverse fish habitat. Habitat at Grassy Point was degraded due to logging and milling activities in the late 1880s and early 1900s to the extent that biodiversity is limited.

The woody debris left as waste from the milling operations, inhibits aquatic vegetation from colonizing the area.

Fish

The Estuary is important for the fishery of western Lake Superior. The variety of depths, substrates, aquatic vegetation, and protected shallow areas provides ideal habitat for the various life stages of fish. Fish are likely to spawn in one habitat, and feed or shelter in other habitats, with overall use of an area changing depending on the species, life stage, and season. For the Estuary, a diversity of habitat types allows it to support a large and diverse warm water fish community of approximately 54 species, which includes important gamefish species such as Lake Sturgeon, Walleye, Muskellunge, Smallmouth Bass, Channel Catfish, Northern Pike, Black Crappie, and Bluegill. The Estuary also supports seasonal use by cold water fish species from Lake Superior including Brook Trout, Brown Trout, Rainbow Trout, Lake Trout, Tullibee (Cisco), and Rainbow Smelt. Many species use the River and Estuary to spawn and return to Lake Superior.

The fish community of the Estuary has exhibited a pattern of increasing abundance and diversity since the Western Lake Superior Sanitary District began treating wastes in 1978, and as other industrial pollution decreased. Compared to fish population surveys before 1979, the MNDNR has seen fish populations recovering, but habitat loss limits further recovery. Near-shore, shallow water habitats can provide important spawning or nursery areas that support healthy self-sustaining populations.

The most recent annual MNDNR gillnet survey in the Estuary captured 18 fish species and 681 individual fish (MNDNR, 2017). The most abundant species collected were Walleye, Channel Catfish, Eurasian Ruffe, Yellow Perch, and Shorthead Redhorse. Other fish species sampled were Alewife, Black Crappie, Freshwater Drum, Lake Sturgeon, Longnose Sucker, Northern Pike, Pumpkinseed Sunfish, Rainbow Smelt, Rock Bass, Silver Redhorse, Smallmouth Bass, White Perch, and White Sucker. Population assessments indicate that the upper SLRE is mostly utilized by warm-water species. The lower SLRE (Duluth Harbor) provides a unique habitat utilized by both warm-water species common to the St. Louis River and cold-water species common to Lake Superior.

Lake Sturgeon were extirpated from the St. Louis River Estuary until reintroduced over 30 years ago. Three Lake Sturgeon were collected during the 2016 gillnet assessment. All three probably represented the first naturally-reproduced year classes in over 100 years. MNDNR expects low catch rates for Lake Sturgeon in the near term because survey nets target juveniles and no stocking has occurred for 16 years, while naturally reproduced year-classes are nearing the recruiting age to match this sample gear type and are expected to increase.

Northern Pike are important sport fish in Minnesota. The SLRE serves as a major spawning ground for Northern Pike. As a predatory fish, Northern Pike require shallow vegetated areas to provide cover while hunting. Much like Walleye, they are a cold water fish, and need access to deep cool pools during the summer. During spawning, Northern Pike need weedy areas such as flooded marshland, so their eggs will stick to the vegetation.

Previous studies of Northern Pike in the estuary conducted in 1978 and 1979 indicate that Grassy Point is one of two primary Northern Pike spawning areas in the lower estuary. An objective of restoration at Grassy Point is to increase and improve available spawning habitat for Northern Pike in the lower SLRE.

Wildlife

The Estuary is recognized by the National Audubon Society as an Important Bird Area for waterfowl, raptors, shorebirds, gulls, and passerines, and is noted for being one of the best and most popular sites for bird watching in Minnesota. The area serves as a corridor for migrating songbirds, shorebirds, and raptors and provides critical food and shelter for these migrants.

Birds seen foraging in the marshes of the St. Louis River Estuary includes Bald Eagle, Osprey, Merlin, Common Tern, Northern Harrier, and Belted Kingfisher. Resident birds include Double-crested Cormorant, Virginia Rail, Sora, Marsh Wren, Common Yellow-throat, Swamp Sparrow, Song Sparrow and Yellow Warbler, and a variety of waterfowl. Over the years, more than 230 bird species have been documented in the estuary.

Plant Communities

Kingsbury Bay

The National Wetlands Inventory (NWI) identified 21.5 acres of wetlands within the Kingsbury Bay Project area (Figure 11A). NWI-mapped wetlands include the following: 17.5 acres of Shallow marsh (Type 3) occupying the majority of the Kingsbury Bay delta; and four acres of Type 7 wooded swamp wetlands occupying the wetland margins and mouth bars of the Kingsbury Bay delta. Several small unmeasured areas of shallow marsh (Type 3) are outside of the proposed construction zone.

A September 9, 2015, wetland delineation was conducted by the U.S. Army Corps of Engineers, St. Paul District Regulatory Branch. Three wetlands were identified and delineated within the AOI (Figure 11A). The AOI chosen was based upon the requirements of a cultural resource study and encompasses only a portion of the Project area.

The wetland within Kingsbury Bay delineation AOI consists of shallow to deep marsh, with a portion of wet meadow and hardwood swamp on the eastern point, and extends upslope to a steep topographic break where vegetation changes to upland species. Along the eastern portion of the site, the wetland is mainly a narrow band of shallow marsh. The delineation was based on field documentation of the changes in vegetation and topography between the wetland and upland areas. Dominant vegetation surveyed includes black ash, balsam poplar, white birch, glossy buckthorn (an invasive species), cattail species, and tussock sedge. Much of the cattail cover is composed of narrow-leaved cattail, an invasive species.

During winter 2016, Fond du Lac specialists delineated cattail stands within the Kingsbury Bay Project area (Figure 11A). Results indicated locally small patches of broad leaf-leaved cattail and mixed broad and narrow leaf-leaved cattail and narrow-leaved cattail dominated much of the shallow marsh (Type 3) wetlands of the Kingsbury Bay delta.

Of the three wetlands identified by the 2015 delineation, only a portion of Wetland 1 lies within the Project area (Figure 11A). Delineation results confirmed the Type 3 shallow marsh conditions mapped by the NWI. Due to its limited scope, supplementing delineation results with NWI-mapped wetlands and documented cattail patches will help understand the wetland types found within the Project area.

Plant communities at Kingsbury Bay were evaluated by the Natural Resources Research Institute (NRRI) during the summers of 2013-15 to identify and map dominant emergent plant types (Figure 14). Dominant plant communities consisted of native alder and sedges, and invasive non-native narrow-leaved cattail and *Phragmites*. Mixed species comprised the remaining area.

NRRI also evaluated submergent vegetation in the open water portions of the Project delineated by NWI as Riverine Systems. NRRI's 2013-15 efforts identified the following vegetation communities: sparse submerged macrophyte bed, mixed macrophyte bed, and floating/submerged macrophyte bed (Figure 15). Depth ranges associated with these communities range from 1 to 8.4 feet, indicating that a mixture of both shallow marsh (Type 3) and open water wetlands (Type 5) are likely to occupy this undelineated area. Plant species typical to these mapped community types are displayed in Table 2. Results of NRRI's evaluation indicate that aquatic plant community composition and depth are correlated. This information was used to inform the creation of post-construction depth ranges supportive of desired vegetation. In consultation with NRRI, the excavation footprint at Kingsbury Bay was reduced in several select areas of higher-quality terrestrial and submerged aquatic vegetation.

Grassy Point

Wetlands were delineated using the *United States Fish and Wildlife Circular 39* classification system developed by Shaw and Fredine (Shaw and Fredine 1971). For the purpose of this EAW, four (4) wetland bodies were located within the study corridor. The delineation verified that the previous NWI survey was mostly correct in terms of the upland/wetland boundaries, however there were no Type 8 wetlands encountered (Type 7 instead), and there were additional fringe wetlands present along the shoreline of Keene Creek to the north (LHB 2013). Wetland areas total approximately 58 acres at Grassy Point (Figure 11B).

Current wetland vegetation consists of Types 2 (wet meadow), 3 (shallow marsh), 6 (shrub swamp) and 7 (wooded swamp). The majority of the emergent wetland habitat is covered with mature vegetation and is dominated mostly by alder thicket and willow species (Type 6 & 7 wetlands) or by cattail and sedge species (Type 2 & 3 wetlands). The lowland areas appear to be mostly native and are very dense with tree, shrub and herbaceous species that prefer wet conditions. Other landscape types found on-site included small pockets of hardwood upland forests, as well as mesic prairie conditions. A few upland areas on site appeared to be previously graded, and vegetation is a mix of native and non-native species such as reed canary grass, tansy and invasive buckthorn (LHB 2013). Additional details are provided in the wetland section under Item 11.

During 2013-15, NRRI evaluated submergent vegetation in the open water portions of the Project area delineated by NWI as Riverine Systems. NRRI identified the following vegetation communities: sparse submerged macrophyte bed, mixed macrophyte bed, and floating/submerged macrophyte bed (Figure 15). Depth ranges associated with these communities range from 1 to 8.4 feet, indicating that a mixture of both shallow marsh (Type 3) and open water wetlands (Type 5) are likely to occupy this undelineated area. Plant species typical to these mapped community types are displayed in Table 2. Results of NRRI's evaluation indicate that aquatic plant community composition and depth are correlated. This information was used to correlate depth with desired vegetation and helped design the proposed post-construction depth ranges.

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 (Kingsbury Bay ERDB# 20160091; Grassy Point ERDB# 20150369) 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.

The MNDNR completed a Natural Heritage Information System (NHIS) review to determine potential impacts to rare species or other significant natural features (Attachment C). Queries of the Minnesota NHIS determined if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the Kingsbury Bay and Grassy Point Project areas. The queries identified the following items:

- A Site of Moderate Biodiversity Significance exists within both Project areas;
- There are no identified native plant communities within the Project areas.
- Lake Sturgeon (*Acipenser fulvescens*), a state-listed special concern species, has been documented in the St. Louis River Estuary in the vicinity of the both Project areas;
- The eastern elliptio (*Elliptio complanata*) and the creek heelsplitter (*Lasmigona compressa*), both state listed mussels of special concern, have been documented in the St. Louis River estuary in the vicinity of the Grassy Point Project area;
- American Eel (*Anguilla rostrate*) and Lake Chub (*Couesius plumbeus*), both state-listed species of special concern, have been documented within the St. Louis River Estuary in the vicinity of the Grassy Point Project area; and
- The northern long-eared bat (*Myotis septentrionalis*), a federally-listed threatened species and state-listed species of special concern, can be found throughout Minnesota; however, the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

The biodiversity significance of the Kingsbury Bay and Grassy Point Sites is largely based on the presence of estuarine coastal marsh habitat. The habitat supports the Lake Superior Coastal Marsh, type MRu94, specifically the Estuary Marsh (Lake Superior), subtype MRu94a, which is ranked as critically imperiled (S1) by the Minnesota Biological Survey (MNDNR). The ranking is based on the community's geographic range or extent, number of good occurrences, trend, scope and severity of major threats, and other factors. Minnesota's estuarine marsh habitat is exclusively confined to the St. Louis River Estuary. Although not extensive historically, large areas containing this natural community have been altered in Minnesota, including areas within the Kingsbury Bay and Grassy Point sites. The proposed project will restore the two sites to enhance the quality of the estuary marsh community by improving and enlarging the shallow sheltered bay habitat that supports it.

In addition, both Kingsbury Bay and Grassy Point Project areas are located within the St. Louis River Estuary, a waterbody that has been designated a Lake of Outstanding Biological Significance (see map in Attachment C). Lakes of Biological Significance exhibit the highest quality features of aquatic plant, fish, bird, or amphibian communities. The State Wildlife Action Plan 2015 – 2025 has identified richness hotspots of Species of Greatest Conservation Need (SGCN). The top 95% scores were delineated as Conservation Focus Areas (CFAs). The St. Louis Bay Estuary CFA received a Medium High score for conservation value and need.

Grassy Point Plant Survey

A sensitive plant survey was conducted at Grassy Point in spring/summer 2013. A target list of rare plant species potentially present on the Project site was developed based on what is known of habitats on the Project site, known occurrences of MNDNR state-listed rare plant species in the area, and the habitat preferences of those species. A coarse delineation of habitat types at Grassy Point was initially determined using aerial photographs. Photographs from several years were studied. Field visits during the month of June refined the initial determinations. Fieldwork was conducted in June, July, August, and September (Walton 2014).

The site is largely wetland with mixed cattail--emergent marshes predominating. There are also small ponds, shrub swamps, a stream channel, grassy areas on upland soils, and patches of poplar forest. A total of 131 plant species were recorded during the survey which includes 108 native species and 23 introduced species (Walton 2014).

No state-listed plant species or other plant species of conservation concern were found during the survey (Walton 2014).

c. 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.

The Project is intended to restore the Kingsbury Bay wetland complex by removing accumulated sediment to create shallow open water, which will increase habitat for submerged, floating-leaf and emergent aquatic vegetation. At Grassy Point, the sheltered bay ecosystem will be restored by removing contaminated materials and wood waste and increasing water depths. A suitable substrate layer will be provided across the site. These activities will result in a restored bioactive zone for fish, macroinvertebrates, and healthy substrate for aquatic vegetation.

Fish

In the short term, placing dredge material into prescribed areas will disrupt nearby fish activity. Fish tend to avoid disturbances such as these and will temporarily find alternative habitat within the harbor. By improving habitat quality and increasing habitat diversity, a greater amount of fish are expected to be produced within and utilize the newly created habitat at the Project area.

Long-term outcomes of restoration of Kingsbury Bay and Grassy Point include optimized bathymetry and establishment of a healthy substrate on which biological diversity will thrive, providing an improved food source for fish using the site. New vegetation will provide improved hunting habitat and cover. Controlling sedimentation and nutrient loading will serve to improve general water quality conditions for fish at the site. Further, coastal marsh wetlands created within the zone of the seiche are particularly valuable as spawning and nursery habitat for native game fish species such as Northern Pike and Muskellunge

Previous restoration efforts at Grassy Point indicate successful recovery of desired fish habitat following wood waste removal and changes to water depth. In 1994 and 1995, MNDNR completed a demonstration project to restore habitat at Grassy Point by removing 11,000 CY of legacy wood waste originating from historic saw-milling operations. In the years following restoration, MNDNR trap netting results documented substantial use of the restored habitat by many species and life stages of fish.

Plants

In the short term, dredging and wood waste removal followed by placement of dredged material will disrupt existing plant communities. Excavation of organic material from Kingsbury Bay will result in a period of lower density and diversity of aquatic plants. At Grassy Point, wood waste will be excavated to create a bathymetric profile supportive of desired wetland plant communities. Fine organic material will cover wood waste that remains after excavation, creating a substrate suitable for aquatic plant establishment.

Emergent marshes currently supporting monocultures of non-native plants will be converted to either upland islands or Open water wetlands (Type 5). Upland areas will be planted to desired terrestrial species. In select areas of Kingsbury Bay, wild rice will be planted as part of the St. Louis River Estuary Wild Rice Restoration Project. In wetland areas, it is anticipated that recovery will occur as a result of the natural transport of seeds and plant fragments to the site from surrounding on-site locations that are not dredged. To the extent possible, removal and placement of fine sediment materials will be timed for fall or early spring to maximize recruitment via vegetative propagules.

Previous restoration efforts at Grassy Point indicate successful recovery of desired plant habitat following wood waste removal. In 1994 and 1995, MNDNR completed a demonstration project to restore habitat at Grassy Point by removing 11,000 CY of legacy wood waste originating from historic saw-milling operations. Following excavation, submergent and emergent aquatic vegetation diversity and abundance increased and overall habitat condition improved. This can be visually observed by viewing the August, 2010, Google Earth image of the area. In the 2010 image, areas included in the 1995 restoration exhibit successful vegetation establishment, while the remaining areas impacted by wood waste are unvegetated.

Tallas Island, a similar dredging-based wetland restoration project in the St. Louis River Estuary, can also be used as a reference for the success of natural plant recruitment. The fifth (and final) year of post-construction vegetation monitoring was completed in 2015 (Barr, 2015). Despite a 500-year flood in 2012 and a dramatic rise in water levels during 2014 and 2015, Tallas Island vegetation has recovered successfully. Monitoring results indicate nearly complete coverage of submerged aquatic vegetation (SAV), with 17 of 18 plots (94.4%) containing SAV and ten unique species observed. The floristic quality index (17.1) represents moderately valuable natural habitat. Non-native SAV were not observed in any sample plots, though purple loosestrife was observed on the shoreline. Tallas Island results indicate that restoration projects designed to consider water depth, substrate type, and wave energy environment are capable of producing an appropriate and resilient outcome.

Following the completion of final construction design plans for the Project, a supplemental Habitat Restoration Plan will be developed to continue restoration efforts both within and outside of the Kingsbury Bay – Grassy Point Project area. Project partners include the U.S. Fish and Wildlife Service, NRDA Restoration Program, MNDNR, and Minnesota Land Trust. The MNDNR will collaborate with local resource management professionals to design restoration strategies, which include enhancing terrestrial (riparian) and nearshore aquatic vegetation and controlling extant and potentially new populations of exotic and invasive species. The Plan will identify focus areas and describe habitat features important for known ecological priorities including Important Bird Areas, Species of Greatest Conservation Need, and Native Plant Communities. Habitat units will be delineated for coastal, emergent and forested wetlands.

Multiple strategies (planting, seeding, bio-medium, natural recruitment) are expected to be used to achieve overall habitat goals at the site. Partners will initiate invasive plant control and other BMPs to reduce the risk of further exotic plant population invasion or expansion. Final planting and seeding will be completed immediately following construction activities to further reduce likelihood for undesirable plant colonization and recruitment. Initial on the ground invasive plant control activities are included in this proposal. Partners will set quantitative performance standards for habitat type outcomes for management units to set clear thresholds for adaptive management activities.

Benthic Community

The metrics of the Project area show that the existing conditions within both the Kingsbury Bay and Grassy Point sites have benthic macroinvertebrate communities of a quality that do not require additional intervention to achieve the removal of BUI 4, according to the SLRAOC QAPP. Using a model of the tri-metric index (TMI), post-construction benthic communities are anticipated to be statistically similar to the pre-construction condition (Attachment E, available upon request). However, it is anticipated that post-project monitoring will describe net positive impacts of restoration project-wide. Following an appropriate recovery period, the resulting benthic communities are expected to be appropriate for the designed depths.

At Grassy Point, the 10-acre area designated by RSU 10.1 was selected to receive a six-inch layer of organic amendment. This amendment will remediate multiple locations where existing benthic communities received TMI scores categorized as poor and extremely poor (see Attachment E, available upon request). Also at Grassy Point, benthic communities in the 8 acre area designated by RSU 3 will be removed due to baymouth bar construction. Loss of these communities via restoration activities will be offset by the creation of open water elsewhere in the Project area. By creating approximately 10 acres of open water wetlands at Grassy Point and 16 acres at Kingsbury Bay, areas previously described as having "zero" scores for benthic macroinvertebrates will be capable of supporting new communities.

In other RSUs, dredged material removal and placement may result in incidental mortality of benthic invertebrates. However, dredge material placed in the restoration areas will provide a more complex habitat structure than existing conditions, and literature suggests benthic invertebrates will typically re-colonize within weeks or months (Resh 1984). Natural macroinvertebrate recolonizations by local populations, in conjunction with improved aquatic vegetation, are expected to result in a more robust benthic community post-restoration.

Wildlife Community

In the short term, construction may keep some birds from entering the Project area when large equipment is moving back and forth. However, long term objectives to increase submergent and floating-leaf aquatic vegetation will in turn provide habitat for birds such as Black Terns, swallows, Pied-billed Grebes, Wood Ducks, Blue-winged Teal, Mallards, and American Black Ducks. Emergent vegetation will provide habitat for species such as the Marsh Wren, Sora, American Bittern, Virginia Rails, Least Bittern, and Yellow-headed Blackbird (Niemi, Davis and Hofslund 1979).

Project impacts on existing aquatic and wetland habitats will occur as monotypic vegetation stands, excessive sediment deposits, and accumulated wood waste are removed. Converting these habitats to functional submergent and emergent wetlands and open water will benefit wildlife that relies on aquatic and shoreline habitat resources.

Establishing emergent vegetation also provides a portal for the emergence of flying aquatic insects (dragonflies, mayflies, midges, craneflies, etc.) which feed myriads of migrating and breeding birds and bats. Designing the Project for abundant and diverse emergent aquatic vegetation increases habitat diversity which benefits aquatic wildlife likely to inhabit the Project area, including mammals (e.g. otters, beavers) and herpitiles (e.g. turtles, frogs).

Rare Features and Ecosystems

Minnesota NHIS queries conducted in 2017 identified multiple rare species or other significant natural features are known to occur within an approximate one-mile radius of the Kingsbury Bay and Grassy Point Project areas (Attachment C). The NHIS report identified the following potential impacts that the Project may incur:

- A Site of Moderate Biodiversity Significance exists within both Project areas; Sites ranked as Moderate contain occurrences of rare species and/or moderately disturbed native plant communities, and/or landscapes that have a strong potential for recovery. Implementation of this restoration Project is anticipated to improve site biodiversity and increase the potential for rare species occurrences.
- Lake Sturgeon can be adversely impacted by actions which alter stream hydrology or decrease water quality, including sedimentation, dredging and filling, stream dewatering, impoundment, eutrophication, channelization, and pollution/contamination. This Project implements dredging and filling activities to achieve goals including improved stream hydrology and decreased sedimentation, improving habitat for juvenile sturgeon.
- The placement of the dredged material has the potential to bury the elliptio mussel, creek heel splitter mussel, and other mussel species. As the distribution, diversity, and abundance of mussels within the project area are unknown, an undetermined number of mussels may be impacted. Given that there are no known occurrences of state-listed threatened or endangered mussels in the area, a permit to take mussels will not be needed.
- American Eel and Lake Chub can be adversely impacted by actions that alter hydrology or decrease water quality including sedimentation, dredging and filling, stream dewatering, impoundment, eutrophication, channelization, and pollution/contamination. The Project proposer will continue to coordinate with MNDNR fisheries to implement any recommended measures to avoid/minimize disturbance to these species.
- Activities that may impact the northern long-eared bat include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal). The Project will not cause these types of disturbances, although some small statured trees would be removed.
- As the St. Louis River Estuary has been designated a Lake of Outstanding Biological Significance, disturbance should be minimized to the extent feasible during construction, operation, and maintenance activities. Actions recommended by NHIS to minimize disturbance that will be incorporated into the Project include:
    - Inspect and clean all equipment prior to bringing it to the site to prevent the introduction and spread of invasive species;
    - Minimize/divert surface runoff;
    - Implement stringent/redundant erosion prevention and sediment control practices;
    - Use sediment control barriers; and
    - Revegetate disturbed soil with native seed mix appropriate for the shoreline conditions and approved by plant ecologist

Known Threatened and Endangered Species

The Minnesota NHIS Detailed Report identified the following threatened or endangered species known to occur within an approximate one-mile radius of the Kingsbury Bay and Grassy Point Project areas.

- Piping Plover (MN Status – Endangered)
- Common Tern (MN Status – Threatened)
- Beach heather (MN Status – Threatened)

The threatened and endangered species identified in the NHIS Detailed Report are not known to occur within the Project area; impacts to these species due to Project activities are not anticipated.

The recent federal review of rare species potentially affected by the proposed project was included in the Draft NEPA Restoration Plan and Environmental Assessment – St. Louis River Interlake/Duluth Tar Site (IEC 2017). As reported, "(h)abitat in this area provides important services for both migratory and breeding bird populations. Breeding birds, such as common terns (*Sterna hirundo*, conservation concern [FWS 2017]) and other colonial nesting birds, use sandy areas of the estuary for nesting, while sedge wren (*Cistothorus platensis*), marsh wren (*Cistothorus platensis*), Virginia rail (*Rallus limicola*), golden-winged warbler (*Vermivora chrysoptera*, conservation concern [FWS 2017]), wood thrush (*Hylocichla mustelina*, conservation concern [FWS 2017]), and sora (*Porzana carolina*) nest in the emergent marsh areas and adjacent forest. However, some bird species that once used the estuary for breeding have disappeared over the years (potentially due to recreational activities in the area, as noted in SLRCAC 2002), such as piping plover (*Charadrius melodus*, federally endangered [FWS 2017]), black tern (*Chlidonias niger*, conservation concern [FWS 2017]), American bittern (*Botaurus lentiginosus*, conservation concern [FWS 2017]), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*). Individuals of some of these species are occasionally observed in the area which increases the chances of recolonization under appropriate conditions (e.g., restored suitable habitat). Bald eagles (*Haliaeetus leucocephalus*, conservation concern [FWS 2017]) are also year-round residents in the area and hunt in the estuary. Migratory bird guilds include songbirds, raptors, shorebirds, waterbirds (waders and waterfowl), gulls, and terns (some of which are conservation concerns [FWS 2017]). Federally-listed birds identified in the general vicinity of the Lower St. Louis River include the piping plover (endangered), red knot (*Calidris canutus rufa*, threatened), and Kirtland's warbler (*Setophaga kirtlandii* [= *Dendroica kirtlandii*], endangered) (FWS 2017). The piping plover and red knot both utilize sandy beach areas; Kirtland's warbler utilizes young jack pine stands in pine barrens distant from potential wild rice restoration locations in the estuary. Accordingly, all three listed bird species are unlikely to be in the project area.

Federally-listed mammals identified in the Lower St. Louis River area include the Canada lynx (*Lynx canadensis*, threatened), gray wolf (*Canis lupus*, threatened in Minnesota]), and the northern long-eared bat (*Myotis septentrionalis*, threatened [FWS 2017]).The gray wolf and Canada lynx require a relatively large extent of northern forest, and are unlikely to be present in the project area. Northern long-eared bats typically roost during summer months underneath bark or in cavities of live trees and snags (standing, dead, or dying trees); in the winter they typically hibernate in caves or mines.

Invasive Species

According to MDNR sampling results in the St. Louis River, a variety of invasive fish species have entered the harbor over the last several decades, including Alewife, Common Carp, Eurasian Ruffe, Freshwater Drum, Round Goby, Three-spine Stickleback, White Perch, spiny water flea, snails, and

zebra and quagga mussel. Although a variety of exotic taxa have established residence, proliferation in the estuary is limited by the cold water temperatures of Lake Superior. Only the Eurasian Ruffe is abundant in the harbor. However, the MNDNR sampling suggests the Eurasian Ruffe peaked in abundance in 1992, and is currently declining.

The MNDNR is managing predator species, in part, to control exotic animals. The zebra mussel has not reached densities documented in other Minnesota lakes it has infested. Reproductive success and recruitment seems to be somewhat limited. Perhaps the waters of Lake Superior provide limited calcium and/or nutrients necessary for zebra mussel growth.

Purple loosestrife (*Lythrum salicaria*) is an invasive wetland plant that grows fast, is hardy, crowds out native vegetation, and provides little value to fish and wildlife. Purple loosestrife is currently growing in the harbor among the native vegetation and has the potential to negatively impact native populations of fish, waterfowl and marsh birds (MPCA and WDNR 1992). Both MDNR and WDNR have released German loosestrife beetles in the harbor as a control method. The potential for adverse impacts upon fish and bird populations would increase if loosestrife becomes more abundant in the estuary. At Kingsbury Bay, NRRI sampling efforts in 2013-2015 identified purple loosestrife in one plot and near two additional plots. Purple loosestrife was observed growing near one plot at Grassy Point. Because purple loosestrife is on Minnesota's prohibited noxious weed "control" list, efforts must be made to control the spread, maturation, and dispersal of propagating parts (Minnesota statutes, Section 18.82).

Non-native *Phragmites (Phragmites australis)* is an invasive grass species that is known to cause severe negative impacts to local ecosystems. Non-native *Phragmites* is classified as a restricted noxious weed in Minnesota, meaning that importation, transportation, and sale of the non-native subspecies is prohibited. However, it is at a pioneer stage in the U.S. portion of the Lake Superior watershed and represents a rare opportunity to eradicate (within the Lake Superior basin) an invasive species in its early stages. Non-native *Phragmites* has not been documented at Kingsbury Bay, though a well-established population is present west of Grassy Point near Lesure Street.

Non-native narrow-leaved cattails (*Typha angustifolia*) and their hybrid offspring outcompete native cattails, forming dense stands (monocultures). As monocultures invade an area, plant diversity declines. MN DNR has not classified narrow-leaved cattails as Prohibited or Regulated Invasive Species. MN DNR allows aggressive management of narrow-leaved cattails, particularly in wetlands and shallow lakes important for wildlife habitat (MNDNR 2014b). Notable infestations of this species has been documented in other Great Lakes coastal wetland areas. At both Kingsbury Bay and Grassy Point, several large narrow-leaved cattail stands have been mapped in areas planned for dredging (Figures 11A and 15).

Impacts from accidental introduction or harboring of invasive species, related to the removal, transport, and placement of dredge material is expected to be minimal. An invasive species management plan will be developed describing ways to minimize risks associated with invasive species during all Project phases. Mitigation techniques may include:

- Implementing purple loosestrife biocontrol in consultation with the regional MNDNR Aquatic Invasive Species Specialist.
- Burning of narrow-leaved cattail biomass prior to excavation at Kingsbury Bay and Grassy Point.

- Handling and transporting invasive plant biomass removed during construction activities using methods that minimize seed movement or dispersal.
- Cleaning equipment vehicles, gear, and/or clothing before arriving at the Project Site and after completion of the Project.
- Cleaning equipment, vehicles, gear, or clothing that arrive at the Project Site containing soil, aggregate material, mulch, vegetation (including seeds) or animals. The contractor shall dispose of material from equipment and clothing at a determined location.
- Selectively handling dredged materials containing invasive species. For example, wetland materials containing exotic plants will be selectively placed into an unsuitable environment. Specifically, wetland material containing narrow-leaved cattail will be placed over areas that will become upland islands.
- Monitoring by the construction contractor to ensure vegetation establishment within contract specifications. Specifications for revegetation will include performance standards for use of native species and the control of weedy and exotic species.
- Long-term monitoring of the Project area for control and management of invasive species.

Any additional mitigation techniques required by the MNDNR in the acquisition of a Prohibited Invasive Species Permit for the Project will be implemented.

A supplemental Habitat Restoration Plan is currently in development that will address invasive and exotic plant species both within and outside of the Kingsbury Bay – Grassy Point Project area. The Plan will be developed following the completion of final construction design plans for Kingsbury Bay and Grassy Point. Habitat Restoration Plan Partners will initiate invasive plant control and other BMPs to reduce the risk of further exotic plant population invasion or expansion. Final planting and seeding will be completed immediately following construction activities to further reduce likelihood for undesirable plant colonization and recruitment. Initial, on-the-ground, invasive plant control activities are included in this proposal. Partners will set quantitative performance standards for habitat type outcomes for management units to set clear thresholds for adaptive management activities.

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

Construction disturbances will occur over a two year period and one completed, long-term adverse effects are not anticipated. During construction, the following measures will be taken to minimize temporary adverse effects to fish, wildlife, plant communities, and sensitive ecological resources:

- Construction during frozen conditions will be carried out whenever feasible, which will minimize disturbance to wetlands and sensitive ecological areas.
- Construction will not occur during the fish spawning months of early spring; machinery will be kept out of the channels of Kingsbury or Keene Creeks to permit fish movement between channels and the lower estuary.
- Rigorous erosion and sediment control best management practices (BMPs) will be employed to minimize turbidity in the water. Floating silt curtain will be used as deemed appropriate and necessary by authorities to isolate work areas and minimize the extent of turbid water areas that may occur as a result of dredging.
- Turbidity-generating activities will be timed (in consultation with the state fishery managers) to avoid potential impacts during important fish migrations and spawning periods.
- A floating silt curtain will act as a barrier so that fish do not enter the work areas.

- Invasive species mitigation techniques described above will be implemented.

The Project area is included in the state-proposed monitoring programs to accompany the AOC delisting activities. Monitoring will be conducted to evaluate benthic community health and vegetation establishment during a five year period after project construction is completed. Close monitoring of invasive species will track whether invasive species begin to proliferate. It is anticipated that restoring open water wetlands in the three to six foot depth range, the distribution and abundance of invasive species will decline as they do not thrive at these water depths, where native submergent, floating-leaf, and emergent aquatic plants are better acclimated. A long-term maintenance plan for the control of invasive species will be developed for the site.

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.

Kingsbury Bay

In May 2015, AECOM conducted a Phase I terrestrial and underwater remote sensing archaeological survey of the Kingsbury Bay Project area (Figure 12A, Attachment D) (AECOM 2015). The primary objectives of the Phase I archaeological surveys (terrestrial and underwater) were to identify potentially significant archaeological sites within the Area of Potential Effect (APE), define the approximate boundaries of any archaeological sites encountered, and determine if any potentially significant archaeological resources would be adversely affected by the proposed federal action.

AECOM included 51.44 acres in the terrestrial assessment area, though due to access issues only 44.06 acres were viewed. Based on historic mapping, a 6.4-acre terrestrial area owned by Midwest Communications, Inc. for which access could not be obtained has a high potential to contain intact, significant historic archaeological resources dating to the mid-nineteenth century. Per AECOM recommendation, ground-disturbing activities will be avoided in this area. The proposed Project will not include any construction in this area and there will also be no construction-related activity such as staging areas or haul roads. The area will remain undisturbed.

The terrestrial survey consisted of pedestrian inspection and shovel testing and resulted in the identification of three archaeological sites representing a mid- or late- 20th century trash dump (Site 21SLaee) and remains of late 19th or 20th century discard activities (Sites 21SLaef and 21SLaeg). AECOM recommended that all sites were not eligible for inclusion in the National Register of Historic Places (NRHP), and no additional work is recommended.

AECOM included 64.79 acres in the underwater assessment area, of which approximately 54.7 acres were navigable for remote sensing purposes. In total, six targets were identified in the underwater survey area, the majority of which consisted of isolated debris and timber scatters. Other objects encountered include old pier stanchion pipes and adjacent boat moorings. None of the other identified targets represent significant cultural resources. No further work relating to the identification of submerged cultural resources was recommended by AECOM for the Kingsbury Bay underwater survey area.

Grassy Point

During summer 2013, Wolfs Head Research Logistics and Duluth Archaeology Center conducted an underwater Phase I survey at the Grassy Point Project area (Attachment D) (Mulholland and Beebe 2013). Five specific cultural materials locations were identified: two sawmills and three shipwrecks. A more detailed Phase II survey was recommended.

In May and June of 2015, AECOM conducted a Phase II underwater archaeological evaluation of two previously recorded sawmill sites (21SL1206 and 21SL1207) and three potential shipwreck sites (Shipwrecks A, B, and C [now 21SL1233]) in the Grassy Point Project area (Figure 12B, Attachment D) (AECOM 2015b). The Phase II evaluation involved an analysis of cartography and aerial photography and underwater remote sensing over an approximately 20-acre area around the mapped locations, and diver investigation.

Site 21SL1206 is the remains of the St. Louis Lumber Company sawmill and ancillary dock structure, and site 21SL1207 is the remains of the Lesure Lumber Company sawmill and ancillary dock structure. Remote sensing data revealed details of the structures and indicated no potential for additional significant data at either site beyond what has been collected during the Phase I and II surveys. AECOM recommended sites 21SL1206 and 21SL1207 as not eligible for listing in the NRHP.

The previously identified Shipwreck A and Shipwreck B were both determined to not represent the remains of sunken vessels. Shipwreck A was identified as a large debris pile interpreted as out-of-context debris from the demolition of the adjacent St. Louis Lumber Company. Shipwreck B was identified as a series of cut pilings related to the dock structure that formerly surrounded the St. Louis Lumber Company sawmill.

Diver investigation of Shipwreck C, now site 21SL1233, documented the remains of wooden flat top barge. The shipwreck was abandoned sometime between 1924 and 1939, based on historic maps and aerial photograph. Given the fragmentary condition of the hull and the overall lack of site integrity, AECOM recommended site 21SL1233 not eligible for the NRHP.

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.

Scenery at the Project areas includes views of wetland ecosystems and related wildlife and the St. Louis River. Such views occur in many areas of the harbor. Construction operations may temporarily obscure vistas and prohibit access to portions of the St. Louis River. Views of construction activity will cause some visual impact. In comparison to existing harbor industrial and shipping activities, project operations will be similar.

While there are no residential areas near the Grassy Point Project area, a residential neighborhood borders the Kingsbury Bay Project area to the north and east, with homes less than 200 feet from potential dredging. The MNDNR has notified adjacent residents about the intent of the Project, duration, expected visual impacts, and complaint procedures and will continue the relationship with these landowners throughout the duration of the project.

Due to the projected two-year project duration, 24-hour construction activities requiring the use of nighttime lighting are not anticipated. Equipment will operate only during daylight hours (7 am-9

pm). Visual impacts affecting the closest residential neighbors should be short-term and minimal in areas where mature trees located between the site and housing would help screen the area. Significant vapor plumes are not anticipated.

Long-term effects on scenic views and vistas will be positive. Project sites will be aesthetically improved as accumulated sediment, wood waste, and monotypic vegetation stands are removed and wetland habitats restored to a more diverse and natural condition. Post-project goals to improve and expand associated trail systems will provide public access to the enhanced scenic views of the St. Louis 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.

No permanent stationary sources of air emissions will be installed as part of this project.

In the short term, pumps and excavation equipment may have negligible emissions from their operation. All equipment will have legally required emissions controls. The level of emissions from the equipment when in full operation is expected to be minimal.

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.

Construction-related emissions will be exempt as *de minimus* and they will meet the conformity requirements under Section 176 (c) of the Clean Air Act, and 40 CFR 93.153. Equipment that will be used include excavators, loaders, trucks, boats, tugs and pumps. Pollutants generated from fuel combustion include carbon monoxide, nitrogen oxides, reactive organic gases, sulfur dioxide, and suspended particulate matter, all of which carry some associated health risks. In addition combustion will produce a large volume of carbon dioxide, a greenhouse gas (GHG). Dredged material transport impacts will last approximately four months during each open-water dredge season and three months during each winter season. Modernized equipment produces less emissions as Environmental Protection Agency emission levels is more stringent on newer engines

Although predicting the impacts of climate change is inherently complex, some climate-induced changes, much of which is due to GHG emissions, are already manifest in Minnesota and are likely to continue. For example, surface water in Lake Superior has shown summer temperature increases that exceed regional temperature increases on land, in part due to a positive feedback on the warming rate from reductions in ice cover (Glick, et al. 2011) (Winkler, et al. 2014). Great Lakes climate predictions include warmer conditions and more frequent and intense storms (MN Sea Grant 2016). The water levels changes on Lake Superior will be amplified during periods of severe drought or extended periods of high precipitation. Looking forward, long-term climate models predict that net decreases in Great Lakes water levels will occur, along with increases in extreme

weather events such as flooding or drought (Hayhoe, et al. 2010) (Glick, et al. 2011). Current Lake Superior water level is several inches above average.

Broad-scale and/or extreme water level fluctuations will likely affect both biological resources that utilize area habitat, as well as human uses of water resources such as navigation, agriculture, and public enjoyment (Winkler, et al. 2014). Long-term changes in Great Lakes water levels will be important to consider when enhancing aquatic and wetland habitat. These altered conditions could affect flow regimes, convert aquatic habitat, cause fluctuations in species compositions, and reduce habitat sustainability (e.g., if species cannot migrate or adapt to new climate conditions). Precipitation and temperature fluctuations may affect at-risk biological resources in riparian and aquatic habitats. Although there is a high degree of uncertainty regarding the effects of climate change on restoration, precautionary approaches can be taken to increase the resiliency of restoration projects.

To prepare for the potential changes in climate and weather, governmental units should consider the extent to which a proposed action and its reasonable alternatives contribute to climate change through greenhouse gas emissions and take into account the ways in which a changing climate over the life of the project may alter the overall environmental implications of such actions (NOAA 2010). In addressing GHG emissions, agencies should be guided by the principle that the extent of the analysis should be commensurate with the quantity of projected GHG emissions. When assessing the potential significance of climate change impacts by proposed actions, agencies should consider both context and intensity. Incremental GHG emissions related to construction include engine exhaust from bulldozers, excavators, trucks, backhoes, barges, and other vehicles and these predicted emissions are anticipated to be short-term and minor. The efficiency of integrating the Kingsbury Bay excavation with the placement of clean fill at Grassy Point prevents the need for expensive hauling to and disposal at a land fill or to a more distant location for beneficial use. Best management practices for air quality will also minimize emissions of GHGs. Wetlands are particularly good at drawing GHG from the atmosphere and storing it over the long term. Estuarine marshes are particularly productive and likely demonstrate a proportionately larger capability in sequestering GHG emissions.

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 proposed project may create some temporary dust during open-water season construction activities. Fugitive dust could arise from light vehicle traffic at both project sites in association with maintenance operations of equipment and stockpile locations. There may be odor impacts from the excavation and dredging of organic material. However, any odors that are generated are expected to be minor and short term in duration. If windy conditions are present, the odor is expected to disburse readily. No long-term or persistent odor impacts are anticipated.

The contractor will be required to follow best management practices to reduce dust during construction such as:

- Covering loads during transport during the open-water season

- Watering access routes and exposed soils if fugitive dust becomes an issue
- Placing mulch, temporary cover and erosion control mats on exposed areas and stockpiles.
- Requiring any fill materials transported onto the Project site to be clean and free of dirt and debris.

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 will be generated during proposed construction activities. Noise will be generated from machinery operation, back-up beepers, and off-site hauling. Other activities on the site will include mechanical excavation, material handling and hauling, and ancillary work needed to restore the Project site, which will occur during daylight hours between 7:00 am and 9:00 pm in accordance with the City of Duluth's noise ordinance. Construction will take place in varying degrees for 2 years, but seasonal downtime is expected. Mufflers and manifolds will be required on all vehicles and machinery in order to reduce noise. Other than hydraulic dredging operations, all other work will take place during the designated times under the City of Duluth's noise ordinance.

Noise area classification (NAC) is based on the land use activity at the location of the receiver and determines the noise standards applicable to that land use activity (MPCA 2015). The rules also establish daytime and nighttime noise level standards based on Noise Activity Classification (NAC) levels. *Minnesota Rules*, part 7030.0050 defines NAC levels based on land uses as 1, 2, 3, or 4. NAC Level 2 is for commercial and recreational land use types, typical to that of the Project Site. NAC Level 1 is for residential land use types. Noise standards are the most stringent in NAC 1 for land uses of residential, religious, and camping areas. NAC 2 and NAC 3 are less stringent, with NAC 3 encompassing manufacturing and industrial land use areas. Area around the Kingsbury Bay are NAC 1 (residential and camping) and Grassy Point are NAC 3 (railroad, shipping and industrial). A NAC 1 area is from one-half to one-mile away from the construction zone at Grassy Point.

Noise Area Classification	Daytime		Nighttime	
	L_{10}	L_{50}	L_{10}	L_{50}
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

Minn. R. pt. 7030.0040 establishes two noise levels, L_{10} and L_{50}, based on the percent of time noise levels exceed the standard over a one-hour time period: L_{10} is defined as "noise levels exceeding the standard for 10% of the time for one hour (6 minutes/hour)" and L_{50} is defined as "noise levels exceeding the standard for 50% of the time for one hour (30 minutes/hour)".

According to the Federal Highway Administration, the average noise level at 50 feet from typical diesel-powered mobile construction equipment is 87 decibels (dB) (FWHA Construction Noise Handbook, Table 9.1). Sound decreases from a point source at a rate of 6 dB for every doubling of distance from the source (MPCA Guide to Noise Control in Minnesota). The table below provides an

estimated noise level as a function of distance (information from the FHWA handbook and the MPCA guide).

Distance from Source (Feet)	Noise Level (dB)
50	87
100	81
200	75
400	69
900	33

The nearest location noise standards in decibels established for NAC Level 2 areas for daytime or nighttime are 70 dB (L_{10}) and 65 dB (L_{50}). Noise standards established for NAC Level 1 areas are as follows: daytime standards (7:00 am to 10:00 pm) for the respective L levels are 65 dB (L10) and 60 dB (L50); and nighttime standards (10:00 pm to 7:00 am) are 55 dB (L10) and 50 dB (L50).

At Grassy Point, the nearest residential property is approximately 2,000 feet from the closest point of proposed excavation. Noise at the site is not expected to cause negative effects on the quality of life for nearby residential property owners. At Kingsbury Bay, the nearest residential properties are approximately 200 feet from the closest point of proposed excavation. However, most excavation will occur greater than 400 feet from residents. Winter phase construction activities at Kingsbury Bay should be of less concern to receptors as most doors and windows are closed. Approximately 15 residents live within 400 feet of the closest construction activity. The MNDNR is in the process of contacting all the nearest residents along the shoreline to inform them of the project and potential for noise levels exceeding NAC Level 1 standards. To date, no residents have expressed concern for the potential for noise and they have been in support of the potential enhancement of their boat access to the bay and estuary as a result of the project. Upon completion of the Project, no new on-going or new permanent noise is expected.

The contractor will be required to minimize noise effects on Kingsbury Bay by:

- Restricting equipment operation only during daylight hours (7am – 9pm).
- Require all equipment to have properly operating muffler systems.
- Restrict idling time for inactive equipment to 15 minutes.
- Inform construction operators of the nearby residential area and schedule loud operations for mid-day.
- Notify adjacent landowners and businesses about the intent of the project, duration, expected noise levels and complaint procedures.

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.

Kingsbury Bay is accessed over public land from and across the Western Waterfront Trail (WWFT) and the Indian Point Campground. The WWFT has a parking area off Pulaski Street. Pulaski Street also services Indian point Campground. Excavation of the Kingsbury Creek delta will occur during the winter and with trucks hauling material across the WWFT, to Grand Avenue, and ultimately to

Grassy Point. The MNDNR is working together with the City of Duluth to establish the most appropriate route for truck traffic. Winter excavation of the delta will likely result in WWFT and parking lot closure during construction months. Summer work at Kingsbury Bay will involve water-based hydraulic dredging, which will not impact land-based traffic.

Construction related traffic associated with winter work: (Kingsbury Bay)

1) There are approximately twenty five (25) unmarked parking spaces and one (1) designated handicapped parking space at the WWFT trailhead. The Project does not propose additional parking spaces in this area.
2) Access routes and staging areas will be established off the WWFT at a designated location along the shoreline of Kingsbury Bay. Location of these areas will minimize impact to the WWFT and the surrounding natural landscape (trees, wetlands, etc.)
3) During peak operations, a maximum of 20 trucks per hour will be hauling material off-site. This traffic will occur during a seven day work week for approximately three months. Truck traffic associated with transporting excavated material out of Kingsbury Bay will run over the WWFT in order to access the most appropriate route to Grand Avenue. The exact route has yet to be determined. Other project-related traffic is considered to be minimal.
4) Estimates of truck traffic, based on an eight hour work day, will be approximately 10 trucks per hour. This traffic will occur during a seven-day work week over a three month period. Other project related traffic is considered to be minimal.

Grassy Point is accessed by the public from a parking lot located at the end of Lesure Street and across a walkway maintained by the City of Duluth. Similar to Kingsbury Bay, excavation and placement of some material will be accomplished during the winter. During this time trucks will access the Project site from the Waseca Industrial Avenue and Lesure Street. Trucks will be travelling loaded with material from Kingsbury Bay for placement at Grassy Point. Trucks may also be transporting wood waste away from Grassy Point to the temporary storage site at XIK Dock #7, before returning to Kingsbury Bay for more material. Access routes and staging areas along Grassy Point will be established away from the existing parking lot to minimize damage. Summer work at Grassy Point will involve water-based mechanical and hydraulic dredging, which will not impact upland traffic.

Construction related traffic associated with winter work: (Grassy Point)

1) There are approximately twenty (20) unmarked parking spaces and two (2) designated handicapped parking spaces at the existing Grassy Point trailhead. The Project does not propose additional parking spaces in this area.
2) Access routes and staging areas will be established off Lesure Street and the parking lot at a designated location adjacent to Grassy Point wetlands. Location of these areas will minimize impact to the surrounding natural landscape (trees, wetlands, etc.)
3) During peak operations, a maximum of 20 trucks per hour will be hauling material on and off-site. This traffic will occur during a seven day work week for approximately three months. Other project-related traffic is considered to be minimal.
4) In addition, trucks emptying Kingsbury Bay material at Grassy Point may transport wood waste from Grassy Point to XIK Dock #7. The access to Dock #7 is located adjacent to the west of the Grassy Point parking lot off Lesure Street. This truck traffic will not result in any increased impact.

Impacts to traffic as a result of post-project conditions resulting from the proposed restoration are considered to be minimal. However, future related plans by the City of Duluth to provide increased and improved recreational opportunities along the shoreline of Kingsbury Bay may increase traffic. The nature of these changes has not been clearly identified, so cannot be evaluated in this assessment.

General impacts to traffic associated with completing the Kingsbury – Grassy Project:

1) The existing total daily traffic is estimated to be less than 2,500 vehicles per day. The total daily traffic after the proposed Project is anticipated to be less than 2,500 vehicles per day.
2) Maximum peak hour traffic is less than 250 vehicles per hour under the existing condition. The proposed Project will not increase the maximum peak hour traffic above 250 vehicles per hour.
3) Increases in trip generation as a result of the proposed Project are expected to be negligible.
4) Other than automobile, the Kingsbury Bay site is accessible by bicycle and pedestrians along the WWFT. Although the proposed Project will not change accessibility to the site, the City of Duluth has plans to revitalize and enhance recreational opportunities, which would increase accessibility to the area. Grassy Point is currently only accessible by automobile and plans to enhance bicycle and pedestrian access have not been developed.

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: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance.

Upon completion of the Project, the maximum peak hour traffic is expected to be less than 250 vehicles per hour and the total daily traffic is expected to be less than 2,500 vehicles per day for both sites. Congestion of local roads and the regional transportation system is not expected since traffic volumes are anticipated to be minimal. The primary consideration will be the effective routing of truck traffic between Kingsbury Bay and Grassy Point during the winter phase of the project. The MNDNR is working closely with the City of Duluth to determine the route that will result in the least impact to the surrounding communities.

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

Negligible effects on the transportation system are expected as a result of the proposed Project and mitigation is not proposed. MNDNR and Contractors will coordinate with MNDOT and City of Duluth transportation authorities. Spillage along roads and other public areas will be cleaned up immediately. Landowners and businesses will be notified about the intent of the project, duration, expected noise levels, transportation schedules, and complaint procedures.

19. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

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.

The Kingsbury Bay – Grassy Point Project Area is located within the Port of Duluth, Minnesota – Superior, Wisconsin, in the St. Louis River Estuary about five miles from Lake Superior. Construction will occur during the winter and summer-fall seasons over a two year period, beginning in January 2018 and ending during the winter of 2019.

The potential environmental effects related to this project could combine with environmental effects from other past, present, or reasonably foreseeable future projects for which a basis of expectation has been laid. The environmental effects of actions occurring at Kingsbury Bay and Grassy Point are considered with other actions identified below.

The environmental effects on water quality and the physical impacts on the St. Louis River Estuary due to the proposed changes to the floodplain and the conversion of wetland types might result in cumulative potential effects. Other environmental effects of the proposed project, including effects on wildlife and fisheries, rare features, the shoreland, water surface use and effects of terrestrial erosion and sedimentation, hazardous and solid waste generation, air emissions, and noise have limited potential to accumulate to a level of significance..

Water Quality

During the excavation and placement of sediment and for several days after actions are terminated, total suspended sediment will be elevated in the water column. Channel excavations associated with these projects will disturb many hundreds of thousands of cubic yards of sediments. Most of the material used to form the channel and fill the existing channel will be from the existing riverbed.

After the restoration is completed and the river banks are re-vegetated, this segment of the river should attain a higher level of stability that reduces the potential for sedimentation over the long term. Total suspended solids and other water quality effects resulting from the proposed project will be regulated by permitting authorities.

Physical Effects on Public Waters

The large areas of wood waste deposits, latent sediment contamination (above SQT Level 1) and depth of the water column at Grassy Point contribute to the lack of wetland development in Grassy Point nearshore waters. Also much of the emergent wetland marsh at Grassy Point is dominated by invasive species. The risk of recreating shallow emergent marsh dominated by invasive species was considered high. Unconsolidated river bottom was considered a less important component of the estuary and increasing its acreage was not a restoration goal.

Wetland acreage at Kingsbury Bay will stay the same. Approximately three to seven years of growth will be required after dredging is completed for marsh vegetation to reestablish to typical healthy marshes. There will be an estimated reduction of approximately one acre of wetland scrub/shrub and 15 acres of invasive cattails and an increase of 16 acres of deep marsh. Currently at Grassy Point, wetland acreage totals 69 acres and consists of shallow marsh (Type 3) largely dominated by invasive cattails and *Phragmites* and some bog and wetland scrub vegetation. After project completion, the wetland acreage at Grassy Point is expected to increase by 12 acres. Collectively shallow marsh, bog, and scrub shrub, much of which is dominated by invasive species, will be reduced by 21 acres. The project proposes to create an additional 33 acres of deep marsh (Type 5), considered a wetland type less prone to invasive species. An additional 18 acres of upland will be a result of expanding the existing islands and creating the baymouth bar. The increases in deep marsh

and upland acreage will coincide with a reduction in emergent marsh dominated by invasive species and unconsolidated river bottom mostly devoid of vegetation. Unconsolidated river bottom habitat will decrease by 30 acres. The goals of the proposed restoration (reducing amount of detrimental materials in the river channel and restoring estuarine marshes of Lake Superior) should be achieved whilst limiting the negative effects of habitat conversion.

Collectively Grassy Point and Kingsbury Bay sites are proposed to result in an increase of 49 acres of deep marsh. Once the vegetation recovers and stabilizes, the created deep marsh can also be referred to as the Estuary Marsh (Lake Superior), subtype MRu94a, which is ranked as critically imperiled (S1) by the Minnesota Biological Survey (MNDNR). Minnesota's estuarine marsh habitat is exclusively confined to the St. Louis River Estuary and thus the restoration of this community gains greater importance. The proposed project will restore the two sites to enhance the quality of the estuary marsh community by improving and enlarging the shallow sheltered bay habitat that supports it. The conversion of habitat is considered largely beneficial. Creation of upland habitat within public waters was only considered acceptable with the purpose being the confinement of wood waste. Positive habitat conversion was achieved through configuring the island to reduce wind fetch reaching backshore areas and creating a new forested habitat that adds diversity recreation potential to the area.

The MNDNR and partners have considered the cumulative potential effects on the floodway for project areas at Kingsbury Bay, Grassy Point, 40th Avenue West, and 21st Avenue West. These projects lie within the floodplain mapped for the St. Louis River and estuary (Flood Insurance Rate Map City of Duluth, MN St. Louis County Panel Number: 270421 0040 D [Revised November 4, 1992]) where the effective water surface elevation is 605 feet (NGVD 29). The effective water surface elevations published by FEMA in this area of the floodplain are controlled by backwater from Lake Superior (FIS City of Duluth, MN St. Louis County, August 1979). It was determined that the proposed excavations and placement of fill for the cumulative projects will not increase water surface elevations of the floodplain because they are controlled by the water surface elevation of Lake Superior. Furthermore, the placement will not impact mapped floodplains further upstream in portions of the St. Louis River. In addition, the volumes of material cut from below the design elevation of 601.1 ft and subsequently filled below that elevation is less than zero. That means that there will be a net increase in the area of open water and increase in water depth and therefore an increase in volume. Cumulative impacts to the floodplain will not decrease the river's ability to convey water.

Limited negative effects on public waters indicates limited potential for cumulative effects.

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.

Besides proposed construction at Kingsbury Bay and Grassy Point, a wide variety of projects are being designed and implemented in the area that affect the St. Louis River Estuary where the Project is located. Construction affecting the Estuary includes the following projects (three project have already been completed) (see table below):

There are several AOC projects near the proposed Project that have been recently completed, are currently being designed, or are in construction. These include Knowlton Creek on upstream side of the Project and 40th Avenue West, Ponds behind Erie Pier and 21st Avenue West on the

downstream side and Kingsbury Creek and Keene Creek flowing into the Project wetlands. As identified in the USACE-Detroit District's 21st Avenue West Restoration Design Documentation Report (2015) and their 40th Avenue West Restoration Design Documentation Report (2016), and as mentioned above in this EAW, surplus organic material from Kingsbury Bay will also be transported and placed in the 40th Avenue West and 21st Ave West SLRAOC restoration sites. It is anticipated this will occur in 2019. As such, these activities will directly interact with this Grassy Point-Kingsbury Bay project, and they will have temporary environmental effects within the geographic scales and timeframes identified above.

Project	Habitat Restoration or Remediation Work	Construction Completion Goal
Howard's Bay (including Hughitt and Cummings Slips)	Remediate contaminated sediments	2018
Superior Light & Power MGP Site/ Coal Slip	Remediate contaminated sediments	2020
Pickle Pond	Sediment remediation and habitat enhancement	2018
Minnesota Slip	Remediate contaminated sediments	2017
Slip 2	Remediate contaminated sediments	2016
Slip C	Remediate contaminated sediments	2020
Northland Pier/ AGP Slip	Remediate contaminated sediments	2019
Azcon Corp/ Duluth Seaway Port Authority Garfield Slip C	Remediate contaminated sediments	2019
Munger Landing	Remediate contaminated sediments	2020
Ponds Behind Erie Pier	Remediate contaminated sediments	2020
Slip 3	Remediate contaminated sediments	2020
DSPA Garfield Slip D	Remediate contaminated sediments	2020
40th Avenue West Restoration	Restore aquatic habitat	2020
Grassy Point Restoration	*Remove non-native material and restore optimum bathymetry*	*2019*
21st Avenue West Restoration	Restore aquatic habitat	2018
Kingsbury Bay Restoration	*Restore wetland complex*	*2019*
Knowlton Creek Watershed Restoration	Reduce sedimentation and restore cold-water stream habitat	2016
Spirit Lake (includes the USX in-water remediation work)	Remediate contaminated sediments and restore aquatic habitat	2020
Mud Lake Restoration (East and West)	Remediate contaminated sediments, remove legacy wood waste and restore optimum bathymetry	2021
US Steel Superfund Site Remediation/NRDAR	Spirit Lake MNR/capping/removal of contaminated sediments to confined disposal facilities and site restoration	2020-2025
Radio Tower Bay Restoration	Remove legacy wood waste and restore optimum bathymetry	2015
Chambers Grove Restoration	Soften hardened shoreline and establish critical spawning habitat	2015

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.

The MNDNR and its partners are removing eight impairments through actions identified in the AOC RAP as part of an on-going effort to restore and rehabilitate legacy related impacts to the AOC. The goal is to construct the aquatic habitat restoration and sediment remediation actions in the St. Louis River Estuary by 2020 as a means toward delisting the AOC by 2025.

The overall goals for completing these projects are described in the Habitat Plan, The Stage II RAP Update, and the Roadmap to Delisting. One of the primary goals of the Habitat Plan is to restore and enhance shallow, sheltered bays in order to offset littoral habitat lost historically through filling and dredging. Concept Plans were developed for each of the two elements of the Kingsbury – Grassy Project (Figures 8A and 8B). The Concept Plans were based on input from all relevant resources management agencies and groups associated with restoration in the estuary.

Project actions along with other proposed actions listed above are cumulative in nature. The specific outcomes identified above might result in some temporary negative environmental effects and in some instances may require special consideration in the permitting phase of the project. Over the long term the project's potential effect on wildlife and fisheries resources, rare features, the shoreland, and water surface use should result in positive outcomes and beneficial effects to the environment of the St. Louis River Estuary. Contaminants will be remediated on the Project area and critical fish and wildlife habitat will be restored.

Cumulatively, the projects proposed in the AOC are expected to improve the ecological function of the estuary and positively impact critical fish and wildlife resources. Positive impacts include: long-term reduction in sedimentation; removing contaminated sediments; removing legacy wood waste; improving condition of the benthos; increasing density and distribution of aquatic macrophytes; softening hardened shorelines; increasing acreage of shallow sheltered bay habitat; reducing abundance of non-native invasive species; and generally increasing quality of habitat for native fish and wildlife populations. These projects have similar habitat improvement goals with short-term impacts similar to those listed for the Project in this EAW. The general intent is that the cumulative effects associated with completion of these projects will have a positive effect on the St. Louis River estuary, which will move the AOC toward the goal of delisting by 2025.

Project actions should result in limited change to the floodplain, an increase in estuarine marsh acreage and managed total suspended solids and other water quality effects. The cumulative potential effects on the physical nature of the St. Louis Bay Estuary due to conversion of wetland type and changes in the floodplain are generally minor and have a minor contribution to cumulative potential effects. Cumulative potential effect on water quality in the generation of total suspended solids and other effects will be controlled by permits and approvals required before commencing construction and effective monitoring during construction. The conditions for these permits require the use of BMPs to achieve a reduced environmental effect.

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.

All potential environmental effects have been addressed above.

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.

Signature *Kate Fairman* Date March 12, 2018

Title EAW Project Manager

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