Minnesota Department of Natural Resources
500 Lafayette Road • St. Paul, MN • 55155-40_

Date: April 21, 2014
To: Parties on the EAW Distribution List
Other Interested Parties

From: Ronald Wieland
Environmental Planner
Phone: 651-259-5157

Subject: Radio Tower Bay Wetland Restoration Project
Environmental Assessment Worksheet
EQB Monitor Notice

The Minnesota Department of Natural Resources (DNR) has prepared the attached Environmental Assessment Worksheet (EAW) to describe the environmental effects associated with the Radio Tower Bay Wetland Restoration project, located in St. Louis County Minnesota. This document has been prepared as a Mandatory EAW pursuant to Minnesota Rules, part 4410.4300, subpart 27 (Wetlands and Public Waters). The DNR is the Responsible Governmental Unit for the environmental review of this project.

A 30-day public review and comment period will begin on April 28, 2014, with the publication of the notice of availability of this EAW in the EQB Monitor. The DNR invites public comments on the EAW during the public review period from April 28, 2014 to May 28, 2014 at 4:30 pm. A copy of the EAW is available for public review at:

- DNR Library, 500 Lafayette Road, St. Paul, MN 55155
- DNR Northeast Region, 1201 East Highway 2, Grand Rapids, MN 55744
- Hennepin Co.- Minneapolis Central Library, Government Documents, 2nd Floor, 300 Nicollet Mall, Minneapolis, MN 55401-1992
- Duluth Public Library, 520 W Superior St., Duluth, MN 55802

The EAW is also posted on the DNR's website at: http://www.dnr.state.mn.us/index.html ➔ Public Input➔ Environmental Review➔ See Radio Tower Bay EAW in the drop down list.

Written comments must be received by Wednesday, May 28, 2014, at 4:30 pm and sent to:
Ronald Wieland, EAW Project Manager
Department of Natural Resources
Division of Ecological and Water Resources
500 Lafayette Road, St. Paul, Minnesota, 55155-4025

Electronic or e-mail comments may be sent to Environmentalrev.dnr@state.mn.us with "Radio Tower Bay EAW" in the subject line. If submitting comments electronically, please include your name and U.S. mailing address. Signed written comments may be sent via facsimile to (651) 296-1811. For additional information, or copies of the EAW, please call (651) 259-5157

Attachment: Radio Tower Bay Wetland Restoration project EAW

Version 8/08rev

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to preparers: This form and EAW Guidelines are available at the Environmental Quality Board's website at: http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The Environmental Assessment Worksheet provides information about a project that may have the potential for significant environmental effects. The EAW is prepared by the Responsible Governmental Unit or its 559596agents to determine whether an Environmental Impact Statement should be prepared. The project proposer must supply any reasonably accessible data for — but should not complete — the final worksheet. The complete question as well as the answer must be included if the EAW is prepared electronically.

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: Radio Tower Bay Wetland Restoration Project

2. Proposer: Minnesota Department of Natural Resources

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3. RGU: Minnesota Department of Natural Resources

Contact person:	Ronald Wieland
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4. Reason for EAW preparation (check one)

☐ EIS Scoping ☒ Mandatory EAW ☐ Citizen petition ☐ RGU discretion ☐ Proposer volunteered

Minnesota Rules, part 4410.4300, subp. 27, item A. Wetlands and public waters.

5. Project location County: St. Louis City/Township: Duluth

Quarter	Section	Township	Range
SW¼SE¼	10	48N	15W
SE¼SE¼	11	48N	15W

GIS COORDINATES (UTM 15, NAD 83)		
CORNER COORDINATES	EASTING	NORTHING
NW	559596	5168849
NE	560761	5168849
SE	559596	5166819
SW	5060761	5166819
TAX PARCEL NUMBERS		
See ownership map.		

Attach each of the following to the EAW:
County map showing the general location of the project:

Fig 1: Habitat restoration projects within the St. Louis River estuary Area of Concern.

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

Fig 2: Radio Tower Bay Wetland Restoration Project (RTBWRP), St. Louis County Minnesota (SLCMN), vicinity map and project overview.
Fig 3: Topographic map of RTBWRP, SLCMN.

Site plan showing all significant project and natural features:

Fig 4: Parcel map for RTBWRP, SLCMN.
Fig 5: Aerial views of Radio Tower Bay (RTB) in 2007, RTBWRP, SLCMN (views towards the northeast with river shown in lower half of images).
Fig 6: Examples of wood waste present within RTB, SLCMN.
Fig 7: Existing conditions with Phase 1 piling removal area, proposed operational unit locations, and current bathymetry in RTB prior to wood waste and sediment removal.
Fig 8: Proposed future conditions with final contours and location of reference cross-sections in RTB following wood waste and sediment removal.
Fig 9: Existing and proposed cross sections for RTBWRP, SLCMN.
Fig 10: Dewatering facility layout including slurry pipeline and carriage water return paths for RTBWRP, SLCMN.
Fig 11: Details for pipeline safety markers, dewatering facility pad design, and rock weir for RTBWRP, SLCMN.
Fig 12: Details for dewatering facility pad/boundary and carriage water return ditch/splash pad for RTBWRP, SLCMN.
Fig 13: Geotextile tube layout within the dewatering facility for RTBWRP, SLCMN.
Fig 14: Details for erosion and sediment control practices (silt curtain, silt fence, bale sediment barrier and temporary construction entrance) used for RTBWRP, SLCMN.
Fig 15: MCBS native plant communities within the project areas for RTBWRP, SLCMN.

Tables accompanying the EAW:

Tab 1: Summarized results from 2008 sampling for baseline sediment parameters in RTB.
Tab 2: Results of nutrient parameters for 2012 sediment testing in RTB.

Attachments to the EAW:

A: Background on St. Louis Bay and its Area of Concern (AOC) Designation.
B: MDNR NHIS Rare Features Database report letter.

Documents prepared in connection with project planning:

Bay West. 2008. Sediment Sampling Letter Report for Mud Lake and Radio Tower Bay. Bay West, Inc., St. Paul. Prepared for Minnesota Pollution Control Agency, St. Paul. 5 pp. + fig, data.

Brady Valerie, Josh Dumke, and Dan Breneman. 2011. Prerestoration Assessment of Biological Condition for Radio Tower Bay in the St. Louis River Estuary. Natural Resources Research Institute (NRRI), University of Minnesota Duluth. Report to Minnesota Land Trust, Duluth, MN. 32 pp. + app.

Cardno JFNew. 2012. Radio Tower Bay Fish Community Sampling, St. Louis River Estuary. Prepared for Minnesota Land Trust, Duluth, MN. 31 pp. + fig.

Cardno JFNew. 2013. Radio Tower Bay Wetland Restoration Material Properties. St. Louis County, MN. Prepared for Minnesota Land Trust, Duluth. 13 pp. + fig.

Mulholland, Susan C., Lawrence J. Sommer, Julie Kloss and Randolph Beebe. 2011. Archaeological Reconnaissance and Evaluation for Marine Debris Removal/Habitat Restoration Project, Radio Tower Bay, St. Louis River, Minnesota. Duluth Archaeology Center Report No. 11-40. Prepared for Minnesota Land Trust, Duluth. 49 pp. + appen.

Minnesota Land Trust. 2011. St. Louis River Radio Tower Bay Marine Debris Removal and Habitat Restoration Project: Phase I Construction. MLT, 7 pp. + attach, fig.

Mulholland, Susan C., Lawrence J. Sommer and Julie Kloss. 2012. Historic Context Study of AM Radio Broadcasting in the Duluth Area for Evaluation of WREX Radio Tower Complex (21SL1126), Radio Tower Bay, Duluth, MN. Duluth Archaeology Center Report No. 12-19. 19 pp.

6. Description

a. Provide a project summary of 50 words or less to be published in the *EQB Monitor.*

Radio Tower Bay is a shallow-water wetland located in the Lower St. Louis River Area of Concern that is degraded with logging-era wood waste. The Minnesota Department of Natural Resources intends to remove the anthropogenic waste and restore native wetland communities.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

Radio Tower Bay (RTB) is 75-acre shallow water wetland within the St. Louis River Estuary. The bay is located within the neighborhood of Gary/New Duluth in the City of Duluth, Minnesota, approximately 16 river miles upstream from Lake Superior and ½ mile downstream from Boy Scout Landing, a public water access on St. Louis Bay. Most of the RTB is under public ownership of State of Minnesota and City of Duluth. The RTB is within the Lower St. Louis River Area of Concern (AOC), which is a designation by U.S. EPA for a geographical area within the Great Lakes that fails to support aquatic life or is impacted in its ability to support aquatic life due to significant environmental degradation. The proposed project is one of many proposals being planned to clean up St. Louis Bay. The Radio Tower Bay Wetland Restoration Project focusses on the cleanup of wood waste and sediment in RTB, a small shallow bay within the AOC. Restoration is defined as the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded wetland, such as identified in RTB (Figures 1, 2, 3, 4, 5, and 6) (Attachment A).

The Minnesota Department of Natural Resources (MDNR) Duluth Area Fisheries, with assistance from the Minnesota Land Trust (MLT), Minnesota's Outdoor Heritage Fund, Minnesota Pollution Control Agency (MPCA), Environmental Protection Agency (EPA), and the National Oceanic Atmospheric Administration (NOAA), intends to restore RTB wetlands and improve fish spawning, nursery, foraging, and overwintering habitat. The project consists primarily of excavating lumber mill waste down to the natural bed of the bay and creating a deepened outlet and "deep water hole" within the bay. Additional funds may be solicited to help reestablish wild rice beds in RTB, if monitoring indicates seeding would be feasible and beneficial.

Project Summary: Between 1891 and 1899, the RTB was the site of two operating lumber mills (Mulholland et al. 2011). Large amounts of wood waste, ranging from saw dust and chips to large slabs from the milling operations, was disposed directly into the open water and wetlands surrounding the bay. Over time, accumulated wood waste reduced the average and maximum depth, simplified the bathymetric profile, and covered the native substrate. Today, 41 percent of the bay has wood waste deposits thick enough to limit plant growth and biological productivity. Boat access to the bay is limited. The wood waste layer averages 1.6 feet thick and ranges from six inches to more than three feet. The resulting water depths are less than two feet across a 23-acre portion of the bay at mean water elevation (601.1 AMSL). Environmental conditions, such as low water temperature, low dissolved oxygen, and lack of currents within the bay, combined with the high volume of wood waste, limit the effectiveness of processes that would break down or disperse the wood naturally. The layer of wood waste adversely impacts fish and wildlife habitat (Figure 7).

The proposed project framework was chosen from several treatment methods considered during an alternatives analysis. The MDNR proposes to use a hydraulic dredge to excavate the wood waste/muck from RTB, pulverize it into a slurry and transport through a pipeline to a dewatering facility, where the materials will be settled and stored for beneficial use as a soil amendment (organic mulch) or if necessary, disposed into an authorized landfill. After the excavation is completed, the MDNR will monitor the reestablishment of marsh vegetation and use by fish and wildlife species in RTB. The restoration approach is identified as Monitored Natural Recovery (MNR), which entails periodically monitoring the condition of the habitat and the trend toward the recovery of aquatic plant and animal communities. If the monitoring reveals that the recovery progress will not meet expectations, the proposer would seek ways to remedy the restoration process, outside of the scope of this project, through interventions, such as re-seeding, or other applicable restoration techniques (Figures 2 and 3).

The MDNR proposes to remove approximately 114,300 cubic yards (CY) of logging-era wood waste and sediment within a 29 acre area of RTB. On-average, 2.5 feet of wood waste/muck sediments will be removed from the area, with some areas deepened to six feet below mean annual water level (AMSL) to create a channel for recreational boat access and a "deep water hole" for a suitable refugium for fish during heat waves of summer and thick icing periods of winter. Projects included in the AOC cleanup initiative must meet quality assurance standards established through a collaborative process and reported within the Quality Assurance Project Plan (QAPP) process, as required by granting authorities. The QAPP required a pre-restoration assessment of the environment, including bathymetry, thickness of woody debris, and productivity/ecological condition of habitats and biota. Results were evaluated and compared with a nearby reference site in North Bay, which is on the river's north side about one mile upstream of RTB. It is not encumbered by thick wood waste deposits.

Baseline studies were conducted to determine project feasibility, alternative treatment methods for removing the wood waste; and options available for managing wood waste disposal (see project planning documents listed above). The project proposal was designed to meet the conditions and requirements of several permits, including: the MDNR Work in Public Waters, the MPCA NPDES/SDS Construction Stormwater Permit (for the dewatering facility), and the federal Clean Water Act and Rivers and Harbors Act. Samples were collected in 2012 to determine the nutrient concentration of the wood waste/muck substrate and the potential for usage in land applications (Tables 1 and 2). Surveys of historical and archaeological sites were completed.

Prior to initiating the proposed excavation, copper sulfate will be applied to the waters in the bay to stimulate aquatic animals to exit RTB into the river. After aquatic animals are sufficiently evacuated from the bay, a silt curtain to contain turbidity within RTB will be placed across the mouth of the bay.

The slurry pipeline will run eastward along the water surface of St. Louis Bay into Mud Lake and exit the lake to the upland site for dewatering, approximately 50 feet above the bay. The proposed 8.5 acres-dewatering facility site, located one mile north of RTB on US Steel owned land, is sparsely vegetated and highly disturbed due to historic industrial use and waste deposition, including slag, sand, and concrete rubble. The slurry will be pumped into permeable holding containers called geotubes arranged and stacked at the dewatering facility to drain off water and settle its organic solids. The decanted carriage water will be monitored for quality and drained back into Mud Lake (Figure 10, 11, 12, 13, and 14).

With the removal of the wood waste/muck sediments, the water basin in RTB will have a reconfigured shoreline and deeper bathymetry that should be beneficial for the estuarine marsh. The natural vegetation is anticipated to reestablish from the latent seed source in the bay and surrounding wetlands. Aquatic plant colonization and establishment is expected occur within one to two years following project completion. The final restoration outcome for the site will include the enhancement or creation of approximately 28.8 acres of productive shallow/deep estuarine marsh. If objectives are not met, further interventions may be employed, such as wild rice seeding, as resources allow or as part of other AOC initiatives.

Project Details: The proposed schedule for excavation will extend through the 2014 open water season in RTB. The hydraulic excavation of RTB is anticipated to span approximately 50 to 90 days, if excavation operates around the clock on a 24-hour work schedule. Equipment mobilization and de-mobilization will require an additional 30 days. The dewatering facility construction is anticipated to take 30 days during the period starting in late-spring. Reseeding and stabilizing terrestrial disturbed areas will occur during the initial construction phase, at the end of the dredging period, and after decommissioning of the dewatering facility.

The project is described in three steps: Mobilization and Site Preparation, Excavation and Restoration, and Demobilization.

<u>Mobilization and Site Preparation:</u> To prepare the project for implementation the proposer will:

- Construct the dewatering facility and associated erosion and sediment controls;
- Install the slurry pipe and associated pump system between RTB and the dewatering facility; and

- Employ environmental effects minimization techniques including the application of copper sulfate to RTB;
- Place a silt curtain at the mouth of RTB to prevent turbidity caused by the project from entering the St. Louis River.

Dewatering Facility. The dewatering facility will be constructed on substrate composed of industrial slag. Heavy metals are bound to the slag buried in the substrate below the proposed dewatering facility. If carriage water is allowed to percolate through the slag, contaminants in the slag could mobilize. An increase in groundwater pH could also occur. For this reason, the dewatering facility and carriage water return system will be isolated from the slag by an impermeable membrane. The outer perimeter of the facility will be lined with pre-cast concrete barriers (Jersey barriers) and an external silt fence. The facility will be sealed to contain all discharge water up to a sufficient capacity to allow solids to settle before discharged into surface waters. The first layer of geotextile tubes will be placed on the site prior to filling with slurry material (Figure 11, 12, and 13).

Slurry Pipe and Associated Pumps. The corridor of the proposed slurry pipeline will run along the north bank of St. Louis Bay downriver to Mud Lake. The pipeline will be placed adjacent to the wetland fringe until it enters Mud Lake, where it will follow the lake's southern shoreline to the railroad grade, then follow the railroad grade to a bridge where it will cross under the railroad and run directly to the dewatering facility. When assembled, parts of the pipeline will remain buoyant and others will lie on the bottom. If necessary, sections will be anchored in place to prevent drifting.

The pipeline will be 1.7 miles in length and between 8 to 12 inches in diameter. The final pipe sizing will be determined by the contractor. At least two booster pumps will be installed in sequence to maintain sufficient pressure for achieving the desirable flow rate. The booster pumps will be sized to deliver slurry, which will contain about 85 percent carriage water, at a rate of between 3,000 to 5,000 gallons/minute. The pumps will be placed on land or on floating barges, as determined by the contractor. The assembly will be placed away from the navigation channel, carry proper identification, and be supported by additional safety buoys to notify boaters of the presence of the pipe and pump structures (Figure 11).

Radio Tower Bay Area. Before enclosing the dredging area with a silt curtain, copper sulfate will be applied to the aquatic areas to move resident animals from RTB. After animals are sufficiently evacuated, a 700-foot silt curtain or equivalent structure will be installed across the mouth of the bay and remain in place until excavation is completed and turbidity levels reaches an acceptable level. Floats will elevate its top edge to the level of the water surface, weights will anchor its base to the bottom, and firmly implanted stakes will secure the ends. The artificial barrier will be able to adjust several feet to match the transitory level of the river. The curtain will remain closed during the duration of dredging except for equipment movements into and out of the bay for purposes such as refueling, maintenance, and repair (Figure 14).

Excavation and Restoration. *Radio Tower Bay Operational Units*. The RTB project area has been subdivided into five operational units, numbered one to five, to stratify construction protocols and restoration objectives. Each operational unit has a different character set that required a customized prescription to achieve desired results. The units differ in their current condition, the volume of waste proposed for removal (or left in place), excavation methodology (hydraulic dredging or mechanical), and the desired future condition, i.e., restoration outcome. An estimate

of the volume of excavation and desired restoration outcome are provided for each operational unit. Invasive species monitoring and management will be conducted in all operational units (Figures 5 and 7).

Operational Unit One (OU1) will demarcate a 20.2-acre portion of the bay, consisting largely of open water that contains a scarcity of submersed aquatic vegetation. Current water depth in OU1 ranges from a few inches to 2.3 feet deep. Approximately 61,000 CY of wood waste and 14,600 CY of mineral soil will be removed from OU1. The new depth profile in OU1 will range between 2 and 6 feet, based on mean annual water level (601' AMSL). A 4.1-acre area in the unit will be further deepened to create a "deep water hole," having a maximum depth of six feet.

Restoration objective for this unit will be to reestablish 20.2 acres of shallow/deep marsh. The desired future outcome for OU1 will be a mosaic of aquatic vegetation patches and open water. The depth of the unit and the growth of aquatic vegetation should provide better spawning and rearing habitat for larval and juvenile fish. The "deep water hole" will provide off-channel overwintering habitat and a summer temperature refugium for larger fish.

Operational Unit Two (OU2) is a 9.9-acre area composed of 8.2 acres of estuarine marsh and 1.7 acres of sedge meadow. The wood waste thickness in OU2 ranges from 1.0 to 3.3 feet, with a ½ foot covering of accumulated organic material. The estuary marsh and sedge meadow plant communities are impacted by invasive species, such as hybrid cattail and purple loosestrife.

In OU2, 32,900 CY of existing wood waste, organic matter, and mineral soil will be removed to expose native substrates composed of deep peaty deposits. The sedge meadow portion of OU2 will remain undisturbed. The restoration for OU2 will establish 7.7 acres of native shallow marsh. Excavated areas with soft organic substrates and water depths between 2 to 3 feet will be monitored to determine whether wild rice reseeding would benefit the area. If beneficial for the restoration process, additional funding will be solicited for the seeding. If necessary, the seeded areas will be protected from excessive wave energy and seed predation, using temporary structures such as plastic fencing and floating booms.

Operational Unit Three (OU3) will be 3.9 acres in size and positioned along the western end of the project area. The 0.9-acre shallow marsh and a 3-acre shrub swamp have been severely impacted by two- to three-foot layer of wood waste. Aquatic vegetation is sparse in OU3 and much of the shoreline is covered exclusively with discarded lumber debris. This unit contains the two stone sawmill foundations, considered potentially eligible for registration on the National Register of Historical Places (NRHP) (Figure 7).

About 4,300 CY of wood waste and organic matter will be removed from OU3 to expose native substrates and restore the shoreline. The restoration for OU3 will establish 1.8 acres of shallow marsh and 2.1 acres shrub swamp. The 0.2 acre historic site will remain in its present condition.

Operational Unit Four (OU4) will demarcate a 2.6-acre area of shallow marsh located at the mouth of RTB. The water depth of OU4 ranges from 1.5 to 2.0 feet, limiting both recreational boat and construction equipment access to the bay. The OU4 contains scattered wood waste and a thick growth of submersed, floating leaf, and emergent vegetation. Approximately 1,500 CY of mixed material (wood waste, organic mulch, and mineral soil) will be excavated to create a six-foot deep by 25-foot-wide access channel. Approximately 0.2 acres within OU4 will be affected. No work will occur in the remaining 2.4 acres of OU4.

Restoration for OU4 will maintain the depth of the proposed six-foot access channel. Following construction, the access channel will facilitate recreational access to RTB and provide larger fish access to refugia habitat in the bay. Natural establishment of floating leaf and submersed aquatic vegetation will likely occur in the channel, but water depths are expected to limit plant density.

Operational Unit Five (OU5) will contain a19.8-acre shallow/deep marsh and sedge meadow area located on the eastern third of the project area. The OU5 contains little to no wood waste and existing marsh vegetation is in fair to good condition. The OU5 encompasses additional historic structures, including remnant foundations for a seven-tower radio broadcast array, an extensive wire grid that grounded the system, and a functional radio tower. No excavation work is proposed in this unit. The exiting marsh vegetation in OU5 will remain undisturbed.

Dewatering Facility Operations. The geotextile tubes will be placed on the dewatering site prior to filling with slurry material. A manifold pipe array will be used to fill tubes in a sequential order and allow "topping off" as the tubes dewater. A polymer will be added to the slurry to help floating solids and suspended sediments settle and free water to escape through the permeable geotube membrane. A polymer dosing station and testing ports for monitoring the polymer effectiveness will be spliced into the delivery pipe near where the slurry pours into the geotextile tubes. A second layer of geotextile tubes will be placed above the first layer after its geotubes have been filled.

The carriage water released from the geotextile tubes will flow by gravity feed to the low end of the dewatering facility that forms an impermeable stone lined collection basin lined. Water samples will be taken from the central collection area and tested prior to discharging into Mud Lake, the receiving water. From the collection area, the carriage water will flow over a low level stone weir and enter a 900-foot impermeable-stone layered ditch, which will parallel the delivery pipe back to its final discharge point on Mud Lake. The geotextile tubes "geotubes" will conveniently allow for discrete amounts of material to be isolated if necessary, or removed for beneficial use, while minimizing disturbance to the remaining product.

Demobilization: *Radio Tower Bay and Slurry Pipe Corridor.* Equipment will be removed from RTB but the silt curtain will remain in place at the mouth of the bay until water clarity improves. The pipeline and pump system will be disassembled and removed from the area. Areas disturbed during the removal of the dredging equipment and the slurry pipe will be restored with native perennial vegetation following construction and prior to project close out.

Dewatering Facility. The excavated material that has been processed through the cutting head, mixed with organic sediments, and allowed to dewater will remain at the dewatering facility location until it is cleared for beneficial use as compost or, if necessary, disposed in a licensed landfill. At the end of the dewatering process, the facility will be decommissioned and the grounds regraded to fit the surrounding terrain. When no longer of use, the geotubes and impervious membrane will be recycled or disposed in a landfill. Following the final grade layout, the disturbed areas will be seeded with perennial native vegetation to provide soil erosion protection and meet habitat restoration objectives (Figures 10, 11, 12, and 13).

c. 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 need, purpose, and beneficiaries of the project described in this EAW are as follows:

- Need – Improve the quality of remaining fish and wildlife habitat areas within the St. Louis River estuary to compensate for marsh habitat permanently lost due to historic industrial development by removing a historical impact to a degraded wetland in the St. Louis River estuary.
- Purpose – Improve fish and wildlife habitat and recreational use of the site and support the removal of Beneficial Use Impairments: Loss of Fish and Wildlife Habitat and Reduced Fish and Wildlife Populations as part of the State of Minnesota's efforts to delist the Lower St. Louis River AOC. Project completion will contribute toward the goal of restoring 1,700 acres of aquatic habitat in the St. Louis River AOC.
- Beneficiaries – State of Minnesota, residents of Minnesota, Federal environmental agencies, estuary users, adjacent residents, the general public, and key stakeholders listed in this EAW.

The objective of the project is to restore the ecosystem services of RTB and support the future delisting of the St. Louis River Estuary as an AOC.

The proposed project will result in numerous benefits, including but not limited to:

- Contributes to addressing fish and wildlife habitat and population Beneficial Use Impairment (BUI) concerns within the AOC and advances the AOC delisting process.
- Creates and enhances spawning, nursery, foraging and overwintering habitat for fish.
- Exposes native substrate and increase average water depth, restores connectivity of the shallow bay with the river, and removes substantial debris settled along the shoreline.
- Improves access for recreational boaters and anglers.
- Restores biological services to a level similar to those prior to the construction and operation of the saw mills.
- Results in no net loss of wetlands. An additional 8 acres of shallow marsh habitat will be created and targeted for wild rice establishment. Waterfowl loafing and foraging areas will be improved because of increased water depth and increased aquatic plant abundance.
- Requires no fill into a jurisdictional body of water to achieve habitat objectives.
- Potentially provides opportunities for domestic harvest of wild rice.
- On the broader scale, benefits the general public and individuals who directly use and depend on the St. Louis River
- Data gathered under the Quality Assurance Project Plan (QAPP), before, during, and after project completion, contributes to the overall body of knowledge on the character and ecology of the bay and methods used for marsh restoration.

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

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.

Phase 1 of the RTB wetland restoration was implemented in February 2012. On behalf of MDNR, the MLT removed more than 200 derelict wood pilings that crossed the bay. The pilings consisted of spruce and tamarac logs driven into the bay in the late 1800's to support railroad trestle segments, totaling about ¼ mile in length. The rail line had been abandoned for more than 100 years. Un-milled 15- to 20 inch diameter log pilings, up to 30 feet in length, were driven vertically into the river bed. Pilings were exposed between one and three feet above the river

bed. About 1500 feet of emergent wetland was crossed to access the work site (Figure 7).

A large excavator was driven onto the frozen bay and securely hitched to each piling. After ice was cleared from around the piling, each was extracted vertically by vibration and upward pull. The pilings were moved along a temporary access route that crossed the frozen marsh then routed along the railroad corridor to access Highway 39. The pilings were transported to an off-site location for storage until reuse. The logs have been donated to other entities for re-use in the construction of boardwalks, support for bird houses, etc.

Work was conducted under frozen conditions between January 2012 and March 2012. Best management practices were applied, including: preventing the spread of invasive species; preventing traffic from rutting or otherwise disturbing the marsh along the access route; and handling hazardous materials in a safe manner. To prevent the spread of invasive species, equipment, materials, tools, and vehicles arriving/leaving the site were required to be clean and free of mud, dirt, and debris. When establishing the temporary access roads, wetland vegetation was protected by platforms used to support equipment when crossing sensitive habitats. A spill plan was required to prevent fuel and oil from the wetland areas.

At the time Phase 1 was proposed, the MDNR determined that an EAW was not required for this phase of the project and that it could proceed to the permitting phase. The details and timing of the Radio Tower Bay Wetland Restoration Project (Phase 2) were unknown when the pilings were removed. Pursuant to *Minnesota Rules*, part 4410.1000, subpart 4, multiple projects or multiple stages of a single project that are connected actions or phased actions must be considered in total when determining the need for an EAW, preparing the EAW, and determining the need for an EIS. The removal of the wood pilings and this project are considered phased actions. Therefore, the environmental effects of Phase 1 and Phase 2 actions have been considered in total in this EAW.

7. Project magnitude data

Total affected area: 29 acres of wetland restoration area within the operational units, 10 acres for the pipeline corridor and 10 acres for the dewatering site. The remaining 27 acres within operational units that are peripheral to the excavation area will not be disturbed.

Project Component	Area (Acres)	Definition
Radio Tower Bay	56 acres	The total acreage where dredging activities and invasive plant management will occur is 29 ac.
Slurry pipeline corridor	10 acres	A 50-foot wide corridor, about 1.7 miles long, extending from RTB through Mud Lake to the site.
Dewatering facility	10 acres	Includes material storage, land-based slurry pipeline, and carriage water return system areas.
Total	76 acres	

Number of residential units: unattached: N/A **attached:** N/A **maximum units per building**
Commercial, industrial or institutional building area (gross floor space) (total square feet): N/A
Indicate areas of specific uses (in square feet):
Office N/A **Manufacturing** N/A
Retail N/A **Other industrial** N/A
Warehouse N/A **Institutional** N/A

Light industrial N/A **Agricultural** N/A
Other commercial (specify) N/A
Building height N/A **If over 2 stories, compare to heights of nearby buildings**

8. **Permits and approvals required.** List all known local, state and federal permits, approvals 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.*

A task force of 11 federal agencies and stakeholders are working together to implement the Great Lakes Habitat Restoration Initiative (GLRI). Funding for this project was received through the National Oceanic and Atmospheric Administration (NOAA) Great Lakes Habitat Restoration Program under a state-federal cost share arrangement, with the GLRI providing the federal portion and the Minnesota Outdoor Heritage Fund, the state portion. MDNR receive both grants.

Unit of Government	Type of Application	Status
State of Minnesota		
MDNR	Public Waters Work Permit	To be obtained
MPCA	SDS Permit	To be obtained
	NPDES/SDS Construction Stormwater General Permit applicable to the dewatering facility	To be obtained
MHS/SHPO	Archaeology/Historical Review (Section 106)	NOAA is processing the review / concurrence
City of Duluth	MS4 Statement of Compliance	To be obtained
	Floodplain –Special Use Permit	To be obtained
	Temporary access agreement/license	To be obtained
U.S. Government		
U.S. Army Corps of Engineers (USACE)	Section 404 Permit, Clean Water Act	To be obtained
	Section 10, Rivers and Harbors Act	To be obtained
Other		
US Steel	Temporary access agreement/license	To be obtained
EPA	Quality Assurance Project Plan (QAPP)	To be updated following completion of construction

9. **Land use.** Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

Between 1891 and 1899 RTB was the site of two operating lumber mills, which deposited a large volume of wood wastes into the bay, causing substantial deterioration of the natural estuarine marsh. The RTB has not been actively used for industrial or residential uses for more than 100 years. The marsh habitat remained largely in a degraded state due the large amount of wastes settled into the bay. Over time some natural recovery likely occurred, but due to the slow decay of the wood wastes, the productivity and condition of the marsh habitat remains poor. The

remnants of the lumber mills, located on the western edge of the bay, and foundations for a seven-tower radio broadcast array within Operational Unit Five, remain of historical interest. Implementation of the proposed project will maintain the current land use designation of the wetland restoration area as submergent marsh and enhance the site's habitat value to fish and wildlife resources. During the project's planning stage, it was determined that the buried wire grid system should not be disturbed. To prevent disturbance, excavation will not occur within Operational Unit Five, where the grid system was located. All work proposed in adjacent operational units will also be outside of the grid's footprint.

A natural gas pipeline right-of-way is located adjacent to the western boundary of RTB. All excavation and project activities will occur at least 125 feet from the pipeline right-of-way. There is no risk of damaging or destabilizing the pipeline during water based excavation. The right-of-way will not be used for equipment access without first taking adequate measures to protect the pipeline.

The dewatering facility is located approximately one mile north of the bay, on lands owned by US Steel. The facility will be outside of a currently designated Superfund site. The current use of the dewatering facility site is as vacant property that is slated for remediation. High pH groundwater has been identified in the vicinity of the historic waste deposit and in Mud Lake, adjacent to the disposal area.

Conflicts with adjacent and nearby land uses could occur due to the operation of excavation equipment, service trucks, and facility lighting. The construction equipment will create some odors, noise, and dust and lighting fixtures will cause glare and illuminate some nearby areas. Siting auxiliary slurry pumps and pipeline equipment in the river and backwater areas could conflict with surface water users, such as recreational boaters. Potential conflicts with adjacent and nearby land uses due to the following environmental effects--odors, noise and dust; visual effects; and effects on surface water use--will be addressed under EAW Item No 24, Item No. 26, and Item No. 15, respectively.

The logging era-related source of stress occurred prior to the time of significant chemical dumping in the St. Louis River. Examination of the MPCA's, "What's in my Neighborhood" database (WIMN), showed the presence of an abandoned and local waste dump, referred to as the Scenic Overlook Dump site, along the slopes flanking the RTB, just north of the railroad corridor that transects the bay. Runoff from the dump site flows into RTB. The MPCA has not identified any contaminates leaking from the dump at this time.

In 2008, sediment samples were collected at 16 locations in RTB to determine contaminant levels of nine metals, polychlorinated biphenyl (PCBs), and total polycyclic aromatic hydrocarbons (PAHs). The wood waste/muck sediments were found to contain safe levels of the metals, PCBs and PAHs. The level of these contaminants was within the range acceptable for their beneficial use on industrial land, such as in landscape mulch applications. All except one arsenic sample were low enough for the material to be used for landscape mulch in residential areas. Other samples unrelated to the proposed project were taken to help understand the range of sediment contamination throughout the lower St. Louis Bay system. One sample located in RTB showed a high level of PCDD/F compounds (polychloro dibenzo-p-dioxin and polychloro dibenzofurans, commonly referred to collectively as "dioxins") in the sediments of RTB. Further sampling is proposed to determine extent of dioxin contamination in RTB, which will be relevant to the MPCA SDS dredge materials disposal permit. The information on solid waste management is

found in this EAW under Item No. 20.

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

Cover Type	Before (ac.)	After (ac.)	Cover Type	Before (ac.)	After (ac.)
Types 1-8 wetlands (public waters)	56	56	Lawn/landscaping	0	0
Wooded/forest	0	0	Impervious surfaces	0	0
Brush/Grassland	0	0	Stormwater Pond	0	0
Cropland	0	0	Other: Riverine	10	10
			Other (disturbed vegetation)	10	0
			Other (enhanced vegetation)		10
TOTAL			TOTAL (all cover types)	76	76

If **Before** and **After** totals are not equal, explain why: N/A

11. Fish, wildlife and ecologically sensitive resources

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The degraded condition of RTB has been documented in a MDNR 2012 fishery assessment. The studies indicated that the bay contains a higher proportion of pollution-tolerant species than North Bay, a reference site approximately one mile upriver of RTB. The low habitat quality of the bay is attributed to the effects of the thick layer of wood waste that blankets the mineral substrate. The materials limit aquatic plant growth throughout much of the wetland. The bay's shallow bathymetry substantially reduces or eliminates the overwintering and spawning habitat for fish, important to the productivity of St. Louis Bay. Several populations of invasive species were identified during baseline surveys.

General Characteristics of Radio Tower Bay: The RTB is a shallow sheltered bay with a direct connection to the St. Louis River. Water depths are influenced by circulation of water in the bay from both the St. Louis River and Lake Superior. The periodic increase and decrease of water depth due to movement of water from one end of the lake to the other is called a seiche. This change in water depth is less pronounced than the tide in coastal wetlands. Under normal conditions in RTB, the water elevations change slightly and gradually. During windy conditions or as the result of storms, water elevation can increase or decrease by almost a foot in the bay as water is either pushed in or pulled out of the bay. The fluctuating water level and influence of water from both the St. Louis River and Lake Superior make the wetlands in RTB estuarine.

The RTB has not been actively used for industrial or residential uses for more than 100 years. No information is available on the type of wetlands that existed in the bay prior to the establishment of the lumber mills. It is likely that the estuarine wetland in RTB would be similar to wetland presently found at the nearby reference site of North Bay. Both sites are shallow, sheltered bays separated from the St. Louis River by a lowland peninsula adjacent to the main channel of the St. Louis River. Based on the assessment of the wood waste depth in RTB, the bay would likely have had a similar bathymetry and substrate type as North Bay. The present basin in RTB is very shallow, with much of it less than two feet. The substrate in the open water area is fine organic

matter consisting of a thick layer of wood waste overlying muck. In very shallow water the substrate is peat with silt and muck.

Fish and Wildlife Resources and Habitats of Project Area: Vegetation: The RTB, which is approximately 16 miles upstream from Lake Superior, contributes estuarine habitat to the wetland system of St. Louis Bay. The freshwater estuary is a place of increased biodiversity and abundant wildlife. The marsh is regarded as estuarine because seiches, which are wind-driven changes in local water levels in Lake Superior, have significant influence on the water level and flow in the Lower St. Louis River. The wetland habitats in RTB are influenced by the river seiche and river flooding from runoff following snowmelt or heavy precipitation.

Vegetation has been mapped for the project area according to the MDNR Minnesota Biological Survey list of native plant communities (NPC). The proposed dredging area is comprised of wetland vegetation and open water. The NPCs are: Estuarine Marsh (Lake Superior) (MRu94a Marsh System); Sedge Meadow (WMn82b) (recently classified as Northern Rich Fen (OPn92)); Willow-Dogwood Shrub Swamp (WMn82a Northern Wet Meadow/Carr); and Black Ash – Silver Maple Terrace Forest (FFn57a Northern Floodplain Forest) are the NPCs found in the project area. (Figure 15).

A typical estuarine marsh community is dominated by floating-leaved and submergent aquatic plants and contains lessor amounts of graminoids and forbs. Dominant species include yellow pond lily (*Nuphar variegata*), eelgrass (*Vallisneria americana*), common coontail (*Ceratophyllum demersum*), and Canadian elodea (*Elodea canadensis*). Other characteristic species include pondweeds (*Potamogeton* spp.), water stargrass (*Heteranthera dubia*), lesser duckweed (*Lemna minor*), and greater duckweed (*Spirodela polyrhiza*). Soft stem bulrush (*Scirpus validus*) is dominant in some areas. Forb and graminoid composition is variable. Dominant species include broad-leaved arrowhead (*Sagittaria latifolia*), sessile-fruited arrowhead (S. *rigida*), giant bur-reed (*Sparganium eurycarpum*), floating bur-reed (S. *fluctuans*), and cattails (*Typha* spp.). Due to the presence of wood waste as the dominant substrate in RTB, these aquatic plant species are not as abundant in comparison to other sites within the estuary. Removing the wood waste will likely result in improved habitat conditions for this native plant community and allow typical marsh vegetation to become re-established.

The Northern Rich Fen (OPn92) NPC is an open wetland type with abundant fine-leaved sedges, variable forb cover, and typically sparse shrub cover. The community typically occurs in peat land basins, usually over several feet of well-decomposed peat or on floating peat mats. The community is associated with the Northern Wet Meadow/Carr (WMn82), which occurs in settings with a highly variable water level. The OPn92 community may be subjected to moderate fluctuations in water level, i.e., slightly elevated from most of the seiche influence in this segment of St. Louis Bay. Environmental effects on the high quality sedge meadow in OU5 will be minor, as no work is proposed for this area of the site.

The Willow-Dogwood Shrub Swamp (WMn82a) and the Black Ash – Silver Maple Terrace Forests (FFn57) are found on slightly elevated terraces on the periphery of the bay, where flooding is less frequent and of shorter duration. The two communities found are within the project area but located outside of the proposed excavation area, except for approximately three acres of the WMn82a NPC. The Shrub Swamp is subjected to moderate inundation following spring runoff and heavy rains, and periodic drawdowns during summer. Peak water levels are high enough and persistent enough to prevent trees (and often shrubs) from becoming established,

although there may be little or no standing water much of the growing season. As a result of water-level fluctuations, the surface substrate alternates between aerobic and anaerobic conditions. The Shrub Swamp is open wetlands with abundant broad-leaved graminoids and shrub cover is typically greater than 25 percent. Shrubs that may be abundant include willows, red-osier dogwood, speckled alder, and occasionally bog birch. The Terrace Forest is present on sites that flood only occasionally—such as terraces and levees—and usually for just a few days at most. Recently deposited sediment, windrowed debris, and ice scars on trees are all useful evidence for distinguishing active floodplain sites from sites where terrace forests occur. Trees form the dominant layer of this community.

The restoration process is being referred to as Monitored Natural Recovery. Once the wood waste layer is removed, it is anticipated that the majority of the plant community will re-grow from the existing seedbank. Additional funding will be required for reseeding wild rice, if monitoring indicates reseeding would be necessary. The guidelines for establishing wild rice beds will be developed for the St. Louis Bay Area of Concern in early 2014 and should be available by June 2014. The guidelines will provide information on selecting a seed source, seeding the bed, and establishing, maintaining, and monitoring the stand.

Fish and Wildlife Resources: The MDNR conducted aquatic vegetation assessments within RTB and North Bay, a reference area not affected by thick wood waste deposits. A pre-restoration zoological assessment was completed in 2011 as part of the QAPP by the University of Minnesota - Natural Resources Research Institute (NRRI) from Duluth. Sampling was conducted in July and August, 2011 and May through July, 2012 to determine the abundance of larval and juvenile fish and macro-invertebrates.

When compared to the reference site, the fish population in RTB contained smaller individuals, remained dominated by insectivores throughout the season and had a greater proportion of pollution tolerant fish. The large presence of insectivores indicated a disturbed trophic structure for fish was present within the bay. The QAPP surveys found habitat generalist species, including black crappie, pumpkinseed, golden shiner, common carp, and black bullhead. Larval sampling captured 21 individual fish larvae from 12 species over three sampling events. No larval fish were captured in 2012 during two sampling events. The 2012 QAPP report also speculated that due to the overall shallow water conditions in RTB fish use during the winter is severely limited or impossible, because the entire water column would be highly susceptible to freezing.

The shallow, sheltered bay habitat within RTB could harbor a number of native amphibians and reptiles. Observations made during the biological assessment identified snapping turtles and other common turtles but no mammals or amphibians were noted. Unfortunately, the large amount of wood waste that makes up the substrate currently may impair the ability of these species to reproduce. The wood waste contributes to eutrophication and oxygen depletion which causes amphibian larval death.

The 2011 macro-invertebrate assessment indicated the community is dominated by pollution-tolerant taxa, such as chironomids and oligochaetes. The RTB's macro-invertebrate community scored between a 6.7 and 6.9 on the Hilsenhoff's Index of Biotic Integrity (HIBI) metric, considered fairly poor and consistent with organic pollution. A post project re-assessment will be implemented at intervals in the project and reference area to assess benthic macro-invertebrate and fisheries communities and evaluate the changes in the ecosystem health of the back bay.

Removing the wood waste will increase the overall depth of RTB, locally provide additional bathymetric diversity, and reconnect native sediments to the biotic community. The improved habitat and anticipated vegetative growth will increase the amount of fish spawning, nursery, foraging, and overwintering habitat. The proposed project will also expose native clay, sand, and organic substrates, which will improve the conditions for aquatic plant colonization and likely increase the overall habitat diversity within the bay. Improved aquatic vegetation will also result in an increase in macro-invertebrate diversity and populations, which will provide food resource for fish, waterfowl, and other aquatic organisms. It is anticipated the proposed project will enable larger fish and more habitat sensitive game and forage fish to use the site in greater numbers, including during the winter months as a refugium.

Environmental Effects and Mitigation: The restoration process will cause a temporary and localized disturbance to fish and wildlife resources in RTB. Dredging operations could cause some fish losses due to entrainment of fish seeking spawning areas, habitat degradation caused by turbidity, and incidental take of amphibians or mammals. Losses of amphibians or mammals that currently use the site are anticipated to be minimal. Carbon emissions and noise produced by the pumps may affect local wildlife populations during project excavation, lasting several months. The larger channel excavated for RTB could increase the seiche influence on the marsh and sedge habitats within the bay. Some peripheral habitats may experience a greater degree of flooding. Over the long term the habitats will provide better conditions for wildlife as the habitats recover.

Prior to initiating excavation activities and installing the turbidity curtain, copper sulfate will be applied to the waters in the bay to stimulate fish and other animals to move to the aquatic areas outside the bay. Copper sulfate is classified by the MDNR as a non-restricted use chemical. Based on MDNR experience in applying copper sulfate for fish movement, the treatment(s) will be highly effective to encourage fish to move out of the bay. Copper sulfate is a chemical that the MDNR Fisheries Section commonly uses on walleye ponds to increase the efficiency of catching young-of-the-year walleye. The application rate to be used at RTB is approximately one pound per acre of water surface area. Some copper sulfate is anticipated to settle out into the sediment at the bottom of the bay after application. However, due to the low application rate and the copper sulfate becoming diluted with other material in the dewatering basin, a negligible concentration of the chemical will result in the excavated material.

After one or more copper sulfate applications, a silt curtain will be installed across the mouth of the bay to prevent fish from re-entering the bay. The curtain will be anchored to the bottom of the bay to effectively prevent sedimentation from moving into open waters and will act as a barrier to prevent fish, amphibians, and reptiles from moving back in during the course of the excavation. Additionally, the selected contractor will be required to fence off the project site. The fence will be effective at preventing amphibians and reptiles from re-entering the site from the surrounding wetland areas.

The copper sulfate applications in RTB waters will likely act as an irritant to amphibians and reptiles as well, encouraging them to move out of the bay. The excavation will result in more natural substrate (gravel, sand and silt), which provides valuable nesting medium for a variety of amphibians and improves the growth of submergent/emergent aquatic vegetation that is also beneficial to feeding, resting, and breeding animals.

The Radio Tower Bay Restoration Project will cause some short-term impacts to the unnatural woody benthos present at the site. The long-term benefits of providing clean, natural sand and

gravel substrate will greatly outweigh any temporary loss of the current wood waste substrate. The post-project conditions will support more diverse and productive habitat for all animal groups using the site. Furthermore, addressing the degraded conditions (wood waste) would result in movement toward removal of the "loss of fish and wildlife habitat" Beneficial Use Impairment (BUI) for the Area of Concern (AOC) and overall better the habitat condition for amphibians within the bay. A seaward silt curtain and landward silt fence will prevent ingress of animals into the construction area and the potential for entrainment during the dredging operation.

Following the removal of the anthropogenic wood waste stressor, the primary strategy for long-term protection and management is to monitor how the system responds through natural recovery. The existing seed bank and adjacent plant colonizers should readily establish in the newly exposed native substrate. With a direct connection to the St. Louis River, the long-term condition of the site is determined by various factors larger than the direct project activities, such as climate change, sedimentation from the watershed, and introduction of new invasive species, for example. Because the site is adjacent or in the vicinity to high quality wetlands in the AOC, specifically Operational Unit 5 and North Bay, the monitored natural recovery method of restoration is the best first course of action. Through post-restoration QAPP monitoring, if it is determined that the site is not progressing toward achieving project objectives, additional interventions, such as invasive species treatment and additional seeding, will be employed.

Species in Greatest Conservation Need (SGCN): The RTB is located within the Laurentian Mixed Forest Province, the Western Superior Uplands Section, and the Glacial Lake Superior Plain Subsection. The subsection occupies a small area in Minnesota, southward of Duluth, but captures a larger area in Wisconsin. This subsection occupies a glacial lake bed and consists of a relatively narrow band of lacustrine clays located along the south and west shore of Lake Superior. The SGCN have been tabulated for the subsection to include 55 species, including over 40 birds and a few species of reptiles, amphibians, fishes and mussels. It is likely that SGCN use the RTB but few SGCN species have been recorded. No key habitats of the subsection will be affected by the proposed project. The site will become more attractive to SGCN as the habitats recover and become more productive.

Invasive Species: During recent botanical studies, four invasive species were identified within the bay: 1) Hybrid cattail (*Typha* spp.)--common and dominant throughout the estuary marsh and sedge meadow wetland communities; 2) Purple loosestrife (*Lythrum salicaria*)--scattered throughout the estuary marsh and sedge meadow wetland communities, with locally dense patches; 3) Reed canary grass (*Phalaris arundinacea*)--common throughout the more heavily impacted areas of the estuary marsh; and 4) Common tansy (*Tanacetum vulgare*)–limited to the periphery of the estuary marsh and more upland portions of the site. After the excavation, the newly created bathymetry will result in the conversion of 29 acres of the bay to unconsolidated bottom clear of vegetative growth. The increased depth of the bay's bathymetry over the excavated area will limit reestablishment of most invasive species presently found on-site, except at the periphery of the excavated area.

The MDNR Operational Orders 113 provides guidance and directives applicable to the agency staff and contractors for implementing site-level management to prevent or limit the introduction, establishment, spread and treatment of invasive species. Operational Order 59 provides guidance and governance for applying herbicides to all MDNR staff and contractors. All herbicide applications will need to comply with labeling, safety protocols, and precautions as prescribed. Pesticide application must be preceded by a Natural Heritage Information System (NHIS)

database review to insure endangered or threatened species or significant native plant communities are not harmed.

Monitoring for invasive species will be conducted concurrently with post-restoration QAPP sampling. If follow up indicates that invasive species reestablishment would limit the success of the project, the site will be referred to the MDNR Invasive Species Program for further management guidance.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources on or near the site? _X_ Yes __No. If yes, describe the resource and how it would be affected by the project. Describe any measures that will be taken to minimize or avoid adverse impacts. Provide the license agreement number (LA-___) and/or Division of Ecological Resources contact number **(ERDB 20130222)** from which the data were obtained and attach the response letter from the DNR Division of Ecological Resources. Indicate if any additional survey work has been conducted within the site and describe the results.

The Minnesota Natural Heritage Information System (NHIS) database was reviewed on March 6, 2013 to determine whether any rare, threatened, or endangered plant or animal species or other significant natural features are known to occur within or near the project area. This query identified historical records for two state-listed plant species, an extant critically imperiled native plant community, and the site is encompassed by a Site of High Biodiversity Significance, as defined by the MDNR Minnesota Biological Survey (Attachment B).

The Estuary Marsh community has a State conservation ranking of S1, indicating its "critically imperiled" status in Minnesota. The occurrence of estuarine marsh in RTB has been altered from the model character observed for estuarine marshes in excellent condition. Due to the presence of wood waste as the dominant substrate in RTB, typical aquatic plant species observed in estuarine marshes are not as abundant and the bay contains a higher percentage of species, such as cattails, that are invasive or increase in presence due to habitat disturbances (Figure 15).

The project will restore degraded emergent and submergent wetlands. While the amount of wetlands will not increase or decrease, the quality of those wetlands will improve, because the concentration of invasive species will be reduced and the degraded estuary marsh/sedge meadow will be restored to shallow/deep water estuarine marsh, considered the historical wetland in RTB.

The key purpose of this restoration project is to restore the estuarine habitat in RTB to a healthy, functioning wetland system. The project will remove a historical impact to a degraded wetland in the St. Louis River estuary. Removing the wood waste will likely result in improved habitat conditions for this estuarine community and enable typical marsh vegetation to re-establish and become more productive. The restored community will support a more diverse animal community, including species of fish, macro-invertebrates, and birds. The proposed habitat improvements are anticipated to increase the quality of the resources available to fish and wildlife, and in the process, compensate for habitat that has been permanently lost due to industrial development along the bay. After the condition of the estuarine marsh has improved and stabilized, the restored habitat will contribute to reaching the habitat improvement goal set for the St. Louis River AOC, which is to restore 1,700 acres of aquatic habitat in the area.

The proposed restoration site and slurry pipeline corridor are within a Minnesota Biological Survey (MBS) Site of High Biodiversity Significance, which stretches from Bear Island to

Smithville, a distance of several miles. This MBS sites contains disturbed areas including active and inactive industrial land, dredged channels, areas of sediment contamination, and a portion of an EPA superfund site. In addition, the native plant communities within this area have been variously affected by disturbances, including bridges and roadways, railroads, radio towers, industrial activities, and residential development. Some low quality habitats such as invasive cattail marshes dominated by narrow-leaved cattail (*Typha angustifolia*) occur within the conservation site. The MBS site has been established because it contains numerous examples of rare features and native communities and it is the only site in Minnesota that contains estuarine habitat. The Bear Island to Smithville site contains several occurrences of Estuary Marsh, a native plant community that is critically imperiled in Minnesota. The long term goal for this site is to improve native habitats and local populations of rare species found within the site. The Radio Tower Bay Wetland Restoration project will improve the quality of the estuarine marsh community and contribute to the overall improvement of the Bear Island to Smithville site by removing a historical impact caused by the heavy deposition of woody waste in the bay.

The Northern Rich Fen (OPn92) NPC, similar to the Sedge Meadow (WMn82b) NPC, is located in OU2 and OU5. It is regarded as a sensitive ecological resource within the project area but not rare in Minnesota. Impacts to the high quality sedge meadow in OU5 will be avoided because no work is proposed for this area of the site. During pre-construction coordination with the contractor, OU5 will be identified as a "no access" area. The quality of the sedge meadow in OU2 is currently poor, with invasive species including hybrid cattail and purple loosestrife commonly found. Disturbance in OU2 will be limited to removing wood waste and non-native species in only a part of the unit. Once the project is complete, conditions in OU2 are expected to be more favorable for the community.

No rare species were documented during the botanical investigation of the RTB. Two vascular plant species listed in the NHIS database were found to be present in the vicinity of the project area: bur-marigold (*Bidens discoidea*) and twoleaf waterweed (*Elodea bifoliata*) are species that are tracked by the State of Minnesota and are currently listed as special concern and endangered, respectively. Bur-marigold is found in forested wetlands or shrub swamp habitats. A small amount of this habitat is found on the periphery of the project area. No occurrences were recorded during biological assessments. If present, potential impacts will be minimal, because no excavation work will occur within these habitats. Twoleaf waterweed is a submergent aquatic plant found in open estuary marsh habitat. The species was not observed during the preliminary biological survey completed in October 2012.

Three state special concern or threatened mussel species have been found within the vicinity of the project area. Mucket (*Actinonaias ligamentina*), creek heelsplitter (*Lasmigona compressa),* and black sandshell (*Ligumia recta*) are known to occur in small to large rivers and are primarily associated with riffles and sandy or gravelly habitat. Given habitat preferences of the mussels, their presence within the disturbed sheltered RTB is not likely. A minor amount of excavation will occur at the entrance to RTB, along a bank of the main channel of the St. Louis River. It is doubtful that sandy or gravelly riffle habitat would be affected. The placement of the silt curtain at the mouth of the bay will largely confine sedimentation to the active dredging area.

Lake sturgeon (*Acipenser fulvescens*) is a state listed fish species of special concern known to occur in the vicinity of the project area. It prefers to spawn in riffle areas with clean gravel in large rivers, such as the main channel of St. Louis River near Fond du Lac dam. Juvenile fish may use a variety of habitats in the estuary for a period of several years before spending the majority

of their time in Lake Superior. Juvenile lake sturgeons were not observed in fisheries assessments in RTB in 2011 and 2012. The lake sturgeon does not prefer shallow marshy habitats as found in RTB. Avoidance measures to be taken to reduce impacts to other fish species--copper sulfate application and silt curtain placement--will ensure the effects of construction on the lake sturgeon population would be minor.

12. **Physical impacts on water resources.** Will the project involve the physical or hydrologic alteration — dredging, filling, stream diversion, outfall structure, diking, and impoundment — of any surface waters such as a lake, pond, wetland, stream or drainage ditch? **X** Yes __No
If yes, identify water resources affected are on the **PWI: 69-1291, St. Louis Bay**. Describe alternatives considered and proposed mitigation measures to minimize impacts.

The proposed project will excavate anthropogenic wood waste, mulch, and sediment from approximately 29 acres of RTB, which is a back bay within St. Louis Bay, a public water resource. The intent of the project is to remove the thick layer of settled wood wastes that inhibits growth and productivity in RTB, in the process restoring wetland habitat for fish and wildlife and improving recreational access to RTB. The wood wastes have caused degradation of benthos, loss of fish and wildlife habitat, and degraded fish and wildlife populations.

Work in Public Waters (WPM): The following information identifies rules that regulate proposed project activities within the public waters of St. Louis Bay. Proposed projects affecting the course, current, or cross-section of a public water body often require a Public Waters Work Permit from the MDNR and permits from other agencies. Pursuant to *Minnesota Rules*, part 6115.0200, subpart 3, which defines prohibitions of excavation under certain instances, the proposed excavation appears not prohibited. As identified in *Minnesota Rules*, part 6115.0200, subpart 5, a MDNR Work in Public Water permit will be required.

Data Gathering in EAW for WPW Permit: This EAW helps to meet some of the basic requirements identified within the Public Water Resource rules, Chapter 6115 and describes regulatory programs and policies relevant to permitting authorities. Pursuant to *Minnesota Rules*, part 6115.0150, the proposed development must be consistent with the goals and objectives of applicable federal, state, and local environmental quality programs and policies, including but not limited to shoreland management, floodplain management, water surface use management, boat and water safety, recreational management, and protected species management, all of which are addressed in this EAW.

Dredge Material Disposal: As stipulated in *Minnesota Rules*, part 6115.0200, subpart 5, the project appears reasonable and practical based on local geological and hydrologic conditions of the isolated back bay and sediment sampling has been conducted to determine if the disposal of excavated materials is subject to requirements of *Minnesota Statutes*, Chapter 115, regarding pollutant concentrations reaching regulatory thresholds for required disposal into a licensed land fill. The SDS permit regulates dredge material disposal and stands with applicable Chapter 115 statutes. If materials are below a specified threshold level set by MPCA, the rules state that the most acceptable means of disposing the materials is their complete removal from the waters and disposal or reuse for other purposes outside of the floodplain; this disposal method is proposed. If above a specified threshold level, the materials will be required under the permit to be disposed at a licensed landfill.

Standards for Excavation: As defined in *Minnesota Rules*, part 6115.0201, subpart 3, concerning specific standards for excavation within a water basin, the project appears to meet the provisions

under Item A, since it has local, state, and federal sponsorships. If the project is successful, it is reasonably to predict that all purposes listed under Item B will likely come to fruition, that is: improve recreational use of the bay, reduce potential for winter fish-kill within the back bay, and remove sediments that are a major source of nutrients and/or contaminants.

Furthermore, the project appears to meet the standards under subpart 3, Item C, that the overall improvement or enhancement is based upon adequate background and field test data. These field data have been gathered and analyzed, as described in the project's Quality Assurance Project Plan (QAPP), including the environmental conditions of the site, present bathymetry, and the baseline status of the floral and faunal communities in the bay and a nearby control site devoid of wood waste. Additional analysis has been conducted on the proposed dredge materials to determine its nutrient content.

With the completion of this EAW, the proposed project appears to meet the provisions of *Minnesota Rules* part 6115.0215, subpart 5 regarding restoration of Public Waters, as defined under Items A to G. A public waters work permit will be granted if the following conditions are met. Pursuant to Item A of this subpart, the proposed project must be compared with other reasonable alternatives to determine whether it is the minimal impact solution to a specific need.

Alternatives Analysis*:* A summary of an alternatives analysis completed by project collaborators is provided below. The alternatives were configured from possible methods of access to the site and methods of excavation, transportation, and disposal of waste materials including the following dichotomies: 1) land-side access vs water-side access, 2) mechanical excavation vs hydraulic excavation, 3) slurry piping vs truck or barge transport, and 4) land fill disposal vs beneficial reuse. The most reasonable combinations of methods were carried forward in the feasibility analysis to construct three project alternatives for comparison: (Alt. 1) Hydraulic excavation with transport to a de-watering basin— with mechanical excavation employed around cultural resources in Operational Unit 3; (Alt. 2) Mechanical excavation with barge transport to Berwin Dock; and (Alt. 3) Mechanical excavation with truck transport to landfill. The implementation difficulty, cost level, and environmental, social, and cultural effects, were compared for the three project alternatives.

Alternatives		
1. Hydraulic Excavation – De-watering Facility	**2. Mechanical Excavation – Berwin Dock Disposal**	**3. Mechanical Excavation – Landfill Disposal**
Environmental Effects		
Least amount of effect on areas outside of Radio Tower Bay. De-watering facility site will be located on an disturbed industrial site	Multiple steps involved in handling material increases potential for spillage. Difficult to isolate bay with a silt curtain during excavation and loading operation. Larger footprint on areas outside of Radio Tower Bay	Multiple handling of material increases opportunities for spillage. Equipment and truck access increase disturbance and potential effect to areas outside of Radio Tower Bay. Work performed in winter would minimize effects on surrounding areas.

Alternatives		
1. Hydraulic Excavation – De-watering Facility	**2. Mechanical Excavation – Berwin Dock Disposal**	**3. Mechanical Excavation – Landfill Disposal**
Cultural Resource (CR) Effects		
Includes mechanical excavation around cultural resource areas to reduce potential disturbance; materials fed to hydraulic dredge	Able to sort material and excavate to minimize accidental damage to CR resources. Allows for potentially appropriate CR mitigation.	Able to sort material and excavate to minimize accidental damage to CR resources. Allows for potentially appropriate CR mitigation.
Social Effects		
No significant increase in traffic on public roads. Transport and disposal occurs in areas that are already disturbed or providing a similar function (right-of-way corridor).	Causes an additional 3,000 to 4,000 barge trips on river Increases in truck traffic from Berwin Dock to landfill (approximately 2,000 15-yard trucks).	Increases in truck traffic on public roads (approximately 7,500 15-yard trucks). Truck and equipment noise generated through neighborhood areas.

Hydraulic excavation with pipeline transport to a de-watering basin (Alt 1) was selected as the preferred alternative. The alternative is considered to have the least potential for environmental effects to areas outside of RTB. The technology used in Alternative 1 has a proven record for moving fine mucky sediments, is feasible to implement in the project area, and is more efficient than the other methods considered. Hydraulic excavation is capable of handling most types of materials, has the advantage of pumping directly to disposal sites, and can operate on a continuous basis to reduce the period of time the back bay is exposed to disturbance.

The environmental effects of hydraulic excavation will be confined to the excavated area within the back bay, while the other alternatives using mechanical means will cause additional disturbance to peripheral habitats and increase traffic and potential hazards encountered on waterways or roadways. The volume of traffic generated under the preferred alternative will be minimal, involving the movement of only dredging equipment and crew. The potential for waste spillage during transport will be lower for the preferred alternative, which involves minimal land-based activities and material handling.

Beneficial Purposes: Pursuant to *Minnesota Rules*, part 6115.0215, subpart 5, Item B, the project must achieve one or more beneficial purposes. Completion of the project will improve and restore fish habitat and improve natural hydrologic conditions in RTB, supporting efforts to delist the St. Louis River estuary as an EPA-designated Area of Concern. Recreational use, specifically access to RTB for angling and canoeing and kayaking will be improved. Providing overwintering habitat for fish will be an additional benefit.

Befitting of *Minnesota Rules*, part 6115.0201, subpart 6, the proposed project's purpose is to improve fish and wildlife habitat. This subpart stipulates that plans be prepared showing the nature and degree of habitat to be benefited and evidence that the project will not create other adverse effects such as flooding, erosion, sedimentation, or navigational obstructions. Items in this EAW describe the habitat characteristics and potential adverse effects.

Environmental Effects and Mitigation: As required under Item C, the proposed project must not exceed more than a minimum encroachment, change, or damage to the environment, particularly to the ecology of the waters. The footprint of the proposed excavation is limited to areas where the wood waste causes a negative impact on the ecological condition of RTB. Once the woody material is removed from the bay, the estuarine marsh vegetation is anticipated to regenerate relatively quickly from the latent seed sources and propagules from the RTB environs.

As prescribed under Item D, the adverse effects to the physical and biological character of RTB will be minimized according to specification described in the QAPP: 1) Early coordination with regulatory agencies and engaging in thorough and extensive pre-project planning among scientists and AOC technical committees; 2) Defining operational units within the bay to improve the specificity of the dredging to the requirements of each unit; 3) Constructing and maintaining erosion control practices such as a turbidity curtain at the mouth of the bay; and 4) Monitoring the progress of the contractor during construction to meet project goals and regulatory standards.

Compensatory mitigation is not proposed for this project, which serves as a habitat improvement project. Removing wood wastes from the bay will improve fish and wildlife habitat. The deeper bathymetry in the bay will help in reestablishing the estuarine marsh habitat, especially beneficial for nursery and foraging. Other measures to prevent adverse effects on public waters are described elsewhere in this EAW, such as the preparation of a Spill Plan under Item No. 20b. Items E and F are addressed under Item No. 14 and Item No. 27 of this EAW, respectively. Item G involves actions resulting from the placement of fill in the wetland, which is not applicable.

Slurry Pipeline: Construction and maintenance activities associated with the slurry pipeline will result in some damage to the marsh surface. 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 the marsh will smother vegetation underneath 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 habits 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 location allows easy access for monitoring. The contractor will have on-site personnel monitoring the pipeline path and booster pumps on a 24-hour basis 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.

Federal and Other Permits: The U.S. Army Corps of Engineers, (USACE), with jurisdiction under Sections 10 of the Rivers and Harbor Act of 1899 and Section 404 of the Clean Water Act, have determined that the aquatic resources impacted by the proposed project are regulated by the USACE under Section 404 of the Clean Water Act. The USACE have authorized the proposed project under Section 10 of the Rivers and Harbors Act by Department of the Army (DA) Nationwide Permit (27) and under Section 404 of the Clean Water Act by the DA Regional General Permit (RGP-003-MN). The USACE oversight of the DA Regional General Permit precludes the MPCA from regulating wastewater under its NPDES authority (Section 402 of the CWA). The SDS permit and the NPDES/SDS Construction Stormwater Permit associated to the dewatering facility are the only permits of the project under the authority of the MPCA.

The excavation area and slurry pipeline corridor fall exclusively within jurisdictional public waters of St. Louis Bay. Therefore, the project will not invoke the wetland regulatory process under the Wetland Conservation Act. The dewatering site and pipeline corridor leading from the bay are situated on disturbed uplands. The dewatering site discharge that will flow into Mud Lake is regulated under the DA Regional General Permit.

13. Water use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? __Yes X No

14. Water-related land use management district. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? X Yes __ No

The RTB is within the 100-year floodplain of the St. Louis River and is part of the public water. At this point near the mouth of the St. Louis River, flood level is largely controlled by Lake Superior, essentially reducing the potential flood levels to less than a couple of feet above the lake. The proposed project is consistent with floodplain standards, because no net fill into waters of the State will occur as a result of this project. The project will restore historic water depths, re-establish wetland habitats, and will not construct any temporary or permanent structures in the floodplain. Based on these factors, the project is compatible with floodplain land use restrictions as define in the City of Duluth Unified Development Ordinance 50-18.1, Natural Resources Overlay, Section C (Floodplains).

Wild and scenic rivers management standards and ordinances do not apply to this project, because the St. Louis River is not designated as a wild and scenic river. The RTB is not located within an area with existing shoreland management standards and ordinances.

15. Water surface use. Will the project change the number or type of watercraft on any water body? **X** Yes _No

If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

It will be necessary to site stationary equipment such as floating pipe sections and pumps in Mud Lake and along the edge of the main channel of the St. Louis River (Figures 2 and 3). The assembly may interfere with recreational boating during the period of project operations. To minimize potential conflicts with boaters, the slurry pipeline will be positioned along the shoreline of the St. Louis River and then along the south shoreline of Mud Lake to the existing railroad grade that transects Mud Lake along a north-northeastern trajectory. From there the pipeline will follow the railroad grade to the northeast for a short distance, where it will cross underneath the trestle and continue in a north-northwesterly direction across the western side of Mud Lake to its northwest shore.

The pipeline may restrict boaters from accessing a portion of the south western part of Mud Lake. Mud Lake is a shallow, sheltered bay with minimal recreational use. Most of the pipeline is positioned along marshy habitats not frequented by boaters. Boater safety will be enhanced by clearly marking the pipeline with buoys and signage, providing lighted warning of the equipment obstruction. The MDNR 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 (Figure 11).

The RTB is currently inaccessible to watercraft with the exception of canoes and kayaks. The project is not providing any facilities or resources to directly facilitate watercraft use, such as a marina or boat docks, but the increased depth within the bay and the vegetation free access channel is expected to increase recreational use within the bay.

16. **Erosion and sedimentation.** Give the acreage to be graded or excavated and the cubic yards of soil to be moved: **acres: 39**; **cubic yards: 114,300**. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

The tally of acreage graded or excavated includes 29 acres to be excavated in RTB and 10 acres to be graded for the dewatering facility and its drainageway. Minimal grading or soil movement is anticipated along the pipeline corridor.

Radio Tower Bay: The volume of materials moved from RTB (114,300 cubic yards) includes 85,100 CY of wood waste, 7,800 CY of peat-like organic matter that accumulated on top of the floating wood waste, and 21,400 CY of mineral soil (sediment). One access approach to the excavation site will be necessary for transport of equipment and crew. A silt fence to prevent the ingress of animals into the construction area will be placed along the perimeter of the excavation zone. The 0.1 mile silt curtain will be placed at the entrance to RTB to isolate the construction zone from the St. Louis River. It will remain functional throughout the dredging operation.

The operation of the hydraulic dredge will cause high turbulence in the bay itself but the work will be isolated from the St. Louis River by the silt curtain. A limited amount of sediment will escape to the St. Louis River Estuary during the infrequent movement of equipment, such as for refueling and maintenance. The re-suspension of sediment that will occur during the excavation will be fully settled before the silt curtain is removed (Figure 14).

Although considered a rare event, an extreme rainstorm could increase the risk of sedimentation. There is a risk of the silt curtain becoming dislodged during such events and a high sediment load being released from the RTB. To prevent its displacement during extreme weather, the silt curtain will be firmly anchored, inspected regularly, and quickly repaired if a breach occurs. In the event that rainfall causes a large outflow from the bay that displaces the silt curtain, most of the sedimentation would likely remain in the shallows of RTB. The MDNR public waters work permit authorizing the excavation will include a provision requiring plans showing that the project will not create other adverse effects such as erosion and sedimentation, according to *Minnesota Rules*, part 6115.0201, subpart 6.

Slurry Pipeline: The slurry pipeline and pumping stations are within public waters. The placement and operation of the pipeline could cause resuspention of sediments at a few shoreline/shallow bottom contact points and along the hill-slope leading from Mud Lake to the dewatering facility. Sediment control measures along the pipeline route will be implemented at vulnerable shore/bottom contact points to minimize erosion and resuspention of sediments.

Dewatering Facility: The dewatering facility site will be graded to create a suitable platform for the geotubes and drainageway. The platform will be shaped for drainage, with 0.3 to 0.4 percent slopes along a west-east or east-west gradient towards a central trough with a 0.5 percent north-to-south slope. The decanted water will collect along the south edge of the facility prior to draining over a shallow weir. The 900-foot drainageway leading from the stone weir to Mud Lake will be constructed on a 10 to 15 percent sloping grade leading to the outlet on Mud Lake.

The volume of earth movement required for shaping the dewatering platform and drainageway has not been determined. The present ground surface of the dewatering site is gently sloping, varying only a few feet in elevation, with one small mound about ten feet above the surrounding construction zone. The dewatering platform and the drainageway will be configured to the existing land contour to limit grading requirements (Figure 10).

Some erosion could occur during the construction of the dewatering facility and along the proposed drainageway, where side slopes are greater than ten percent, and at the outfall structure near the shoreline of Mud Lake. Prior to the construction of the dewatering facility, downslope erosion controls will be in place and functioning properly.

An impermeable membrane will be embedded between clean gravel and surface stone to prevent additional water percolating into the slag materials. The stone layer placed above the membrane will reduce water velocity, eliminate erosion, and reduce the resuspention of colloidal materials. The drainageway will also have an impermeable layer and an 18-inch layer of mostly cobble- and stone-sized riprap greater than six inches in diameter to help dissipate energy. Some filtering will occur while flowing through the coarse stone layer. The rock weir and apron/splash pad structures will be installed, respectively, at the beginning and end of the drainageway to dissipate energy before the water enters Mud Lake. Additional filter treatments will be placed at the rock weir if necessary (Figures 11 and 12).

The Minnesota Department of Transportation (MnDOT) Spec 3876.2 mixture 150 will be used to establish vegetation on areas disturbed during the construction and operation of the dewatering facility. Seeding will take place within seven days of disturbance to prevent the establishment and spread of invasive plant species. Disturbed areas will be reseeded with perennial plant materials, using MnDOT Spec 3876.2 mixture 350, within one month of the de-construction of obsolete elements of the dewatering facility. Some parts of the dewatering facility will remain intact to support the long-term storage and operation of the dewatering facility. Upon full decommissioning, the site will be regraded to conform to surrounding landscape and prevent erosion and vegetated to stabilize disturbed soils.

17. Water quality: surface water runoff

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

The RTB's topography is flat and surface water on the site is directly connected to the St. Louis River. Work in Radio Tower Bay will occur solely on lands positioned below the OHWL. For projects affecting lands below the OHWL, the Work in Public Waters permit typically fulfills the regulatory responsibilities engendered in the MPCA's stormwater pollution prevention plan (SWPPP). To avoid duplicative jurisdiction, the SWPPP is not required for activities in RTB.

The "watershed" for the facility is 8.5 acres in size. The perimeter structures will isolate the drainage platform (pad) from the external gradient of the surrounding area. The dewatering facility and drainageway will be constructed on a layered base, from bottom to top—six inches clean fill-impermeable membrane-six inches stone. The runoff will be isolated from the ground surface by the impermeable membrane. It will flow through the stone layer above the membrane surface and remain relatively clean when entering Mud Lake. A typical one-inch rainfall event would produce approximately 231,000 gallons of runoff. The carriage water (see Item No. 18) will commingle with the rainwater if operation/drainage continues during rainfall periods.

The NPDES/SDS Construction Stormwater General Permit (No. MN Rl0000l) is required for construction of the dewatering facility. Area of land disturbance during construction will be greater than one acre and therefore be subject to the terms and conditions of the permit and the discharge of construction stormwater. *Minnesota Rules*, part 7090.2040 requires the project manager of a construction activity to complete a Stormwater Pollution Prevention Plan (SWPPP) prior to submitting an application for this permit and prior to conducting any construction activity. Operators of construction activity must complete a 12-step discovery process before completing the permit application and beginning construction. The process helps the project manager determine eligibility for coverage under the general permit. The EAW covers many of the 12 steps completed during the on-line permit application. Permit coverage will begin seven days after submitting a complete application (Figures 11 and 12).

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The St. Louis River watershed, which covers 3,584 square miles, is located at the head of the Great Lakes and represents the extreme headwaters of the St. Lawrence River. Minnesota's 2012 Impaired Waters List identifies this section of the St. Louis River (Reach ID 04010201-532) as impaired for aquatic consumption due to the following pollutants or stressors: DDT, Dieldrin, Mercury in Fish Tissue, Mercury in Water Column, PCBs in Fish Tissue, and PCBs in Water Column. The immediate and major downstream water body of the RTB is the main channel of the St. Louis River. Its confluence with Lake Superior is located about 16 miles downstream from the RTB. The St. Louis Bay waters are managed as class 2B waters, i.e., the waters are protected for a healthy warm water aquatic community and industrial cooling and materials transport use without a high level of treatment.

The river segment that includes RTB is rated suitable for swimming and wading, with low bacteria levels throughout the open water season. In a 2013 water quality monitoring report, the MPCA found the Mission Creek to the Oliver Bridge reach of the St. Louis River meets criteria for ammonia level and fully supports the aquatic recreation use of class 2B.

Because the wetland restoration project area will be isolated from the river by the silt curtain, limited drainage from the bay will occur during operations. Some elevated flowage out of the bay could only occur during high rainfall events. After dredging operations are completed, the channel leading into the bay will be approximately six feet deep and twenty-five feet wide to allow a more dynamic exchange of water and sediments during high water events and wind-driven seiches. This dynamic connection between the bay and the estuary is a design outcome that is intended to facilitate healthy exchange of sediment and nutrients and provide a flushing effect to the bay once the restoration is complete. Other unimpaired bays in the estuary are maintained through the same physical function. Mud Lake is an off-channel wetland of the St. Louis River Bay and is the immediate downstream water body receiving runoff from the dewatering facility.

18. Water quality: wastewaters

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

Approximately 85 to 88 percent of the slurry will be carriage water, which will be released as wastewater from the dewatering facility. The wastewater will be discharged to Mud Lake, which

forms a broad wetland/lake within the St. Louis Bay. The estimate of total wastewater volume ranges from 131 million to 170 million gallons over the course of the project.

The dewatering facility platform (pad) will consist of a six-inch base layer of clean, imported fill, an impermeable membrane, and a 6-inch top layer of coarse stone to isolate the carriage water from the industrial waste materials beneath the ground surface. Gravitational forces will cause the carriage water to drain through the permeable geotube membrane into the coarse stone layer then flow along the sloping impermeable membrane to a collection basin. The 6-inch top layer of coarse stone placed over the impermeable membrane will provide approximately 417,000 gallons of storage.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies (identifying any impaired waters), and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

During the transport of slurry, incidental fallback of dredge material into surface waters of St. Louis Bay will be prevented by keeping equipment in good working order. In the event of a spill of dredge material, the contractor will be required to suspend operations until the leak is fixed. Spillage will be removed immediately under the MDNR's supervision and the area receiving waste material will be returned to previous elevations (Figure 10).

The dredge slurry will be treated at the dewatering facility with a cationic polymer at a rate of 10.7 lbs per dry ton (dredged material) prior to being pumped into the geotextile tubes. The polymer application will speed up the settling of dredge solids from the carriage water. The wastewater will be discharged at a rate not to exceed 4 cubic feet per second through a controlled stone weir then follow an impermeable drainageway that has been anchored with rock. The ditch is designed to carry the carriage water and any potential precipitation received on site.

Prior to being discharged, the wastewater will be tested for turbidity and possibly other water quality parameters. Testing will be conducted during the startup and periodically thereafter until processing is completed. If the discharge water does not meet water quality standards applicable to St. Louis Bay, further treatment may be necessary. If the water quality parameters are well within the water quality standards, testing may be conducted less frequently.

As discussed under Item 20 in the EAW, the proposed post-dredging sampling protocol for dioxin is contingent on the results from the sampling of sediments in RTB during the spring, 2014. If sediments exhibit dioxin levels that require additional monitoring, the sediments collecting in the settling basin will be tested for dioxin to ensure water quality standards are being met.

The USACE have authorized the proposed project under Section 10 of the Rivers and Harbors Act by Department of the Army (DA) Nationwide Permit (27) and under Section 404 of the Clean Water Act by the DA Regional General Permit (RGP-003-MN). As identified in DA Regional General Permit (RGP-003-MN), all work or discharges to a watercourse resulting from permitted construction activities, particularly hydraulic dredging, must meet applicable Federal, State, and local water quality and effluent standards on a continuing basis. The water quality testing protocol will be further refined by the USACE in cooperation with the MPCA.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary. N/A

19. Geologic hazards and soil conditions

a. Approximate depth (in feet) to ground water: 0 minimum, >6 average;
to bedrock: >60 minimum; >60 average.

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

Groundwater: 0 feet minimum; 0 feet average - Radio Tower Bay site

Groundwater: 1 foot minimum; 1 foot average – dewatering facility site

Bedrock: Less than 7 feet minimum; Less than 7 feet average – Radio Tower Bay site

Bedrock: Less than 7 feet minimum; Less than 7 feet average – dewatering facility site

No sinkholes, shallow limestone formations, karst conditions, or other geologic hazards are present on the wetland restoration site or the dewatering site.

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil texture and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

The Natural Resources Conservation Service (NRCS) provides electronic soil survey maps through the Web Soil Survey. The RTB excavation area falls within the "open water" mapping unit (MU), generally identifying the estuarine marsh habitat, and the following MU--Bowstring and Fluvaquents (1020A), loamy with zero to two percent slopes and frequently flooded. The 1020A MU essentially circumscribes the sedge meadow community found within the bay. The dewatering facility will occupy disturbed soils within the "urban land" component of the Urban land – Cuttre – rock outcropping complex MU (18A) that has zero to three percent slopes. The facility will occupy a vacant lot, formerly used as a disposal site for waste materials and slag from a steel mill, until operations ceased several decades ago. The waste materials remain on the site.

Groundwater contamination will not occur during project operations because no contaminants will be used or generated at RTB or at the dewatering facility. A small quantity of fuel could spill during project operation. The potential for groundwater contamination will be minimized by developing a Spill Plan and not allowing fuel storage within the project areas. The discharge water will not be allowed to infiltrate the waste materials below the ground surface.

20. Solid wastes, hazardous wastes, storage tanks

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

The sediment characterization completed in 2008 indicated the type and level of pollutants in the RTB 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.

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.

Sixteen samples were collected in RTB and analyzed for contaminant levels of typical pollutants encountered in St. Louis Bay. The sediments were tested for total PCBs, PAHs, and nine types of metals contaminants--Arsenic, Lead, Zinc, Cadmium, Mercury, Chromium, Nickel, Copper, and Selenium. All contaminant parameters identified in the 2008 report were below the SRV Management Level 2 threshold. All but one sample of arsenic were below the SRV Level 1 threshold (Table 1).

In 2012 a single, randomly-located sediment sample was collected in RTB as part of a St. Louis River estuary-wide study to determine the presence of pollutants, including polychlorinated dibenzo(p)dioxins and furans (PCDD/Fs, or dioxins). The sample yielded a SRV dioxin concentration level that placed the sample in Management Level 3. The MDNR has developed a testing and contingency plan to better understand the distribution and concentration of dioxin within RTB. The plan is necessary for determining whether special construction and handling methods for dredge material disposal is required. A sediment sampling design is being developed and will be submitted to MPCA for approval during the SDS permitting process. The MDNR plans to collect a composite dioxin sample for each of the operational units getting excavated.

The MDNR has defined a contingency plan for dredge material management, if the samples yield dioxin at Level 3 concentrations. Fortunately, using the geotextile tubes for dewatering allows material to be segregated according to its defined dredge material management level, which will be determined from the samples taken in RTB during the spring, 2014. Wood waste excavated from operational units that qualify for Level 1 or Level 2 re-use will be proposed for use as a soil amendment. Further testing will be completed at the dewatering facility for the materials originating from operational units that yield Level 3 SRV values (Figure 14).

Results generated during the spring 2014 dioxin sampling of operational units in RTB will determine post-dredging sampling protocol at the dewatering facility. All of the operational units may yield dioxin concentrations in Level 1 or Level 2, which will allow the beneficial reuse of the materials. However, if the materials sampled in RTB have dioxin concentrations of Level 3, the solids will be isolated at the dewatering facility for further testing. The bulk product isolated in the geotubes will be resampled to determine whether the materials retain the Level 3 management classification. Additional mixing and settling may reduce concentrations of dioxin

to a lower management level, making them suitable for industrial applications. Samples will also be taken from the sediment found in the collection basin for the return water. These samples will be taken to ensure that water quality standards are being met. Upon satisfactory determination of the Management Level, MPCA would be able to appropriately define within the SDS permit the conditions of operation for the dredge material placement work.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

No toxic or hazardous materials will be used or are present on the site. Copper sulfate used for evacuating fish from the bay is classified by the MDNR as a non-restricted use chemical. The copper sulfate will be used at the recommended rate 0.37 to 0.95 lbs/acre feet, which is equivalent to 0.14 to 0.35 parts per million (ppm). The application rate is based on recommendations for water bodies with a total alkalinity between 41 and 100 ppm. Alkalinity in the lower St. Louis River is between 77 and 95 ppm. An application rate of up to 1 ppm in water bodies with total alkalinity greater than 50 ppm is safe for all fish. The treatment loses its effect rapidly because the dissolved copper quickly precipitates and remains in a relatively stable form in the sediments. There will be limited potential for compounding environmental effects due to the use of copper sulfate because there is not a history of using copper sulfate in RTB.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

No above or below ground tanks are present on the site. Excavation equipment will be re-fueled from a boat. Pumps along the slurry pipeline and in the dewatering facility will be re-fueled by trucks or ATVs. Prior to project startup, the selected contractor will be required to develop and implement a written refueling strategic plan and an emergency spill response plan. A standard safety measure identified in the plans require that above ground storage tanks, containing over five-hundred gallons of fuel and located within 500 feet of a Class 2 surface water, need to be located in a secure, impermeable structure to capture potential tank leakage, pursuant to *Minnesota Rules*, Chapter 7151.

The potential for fuel or other fluids associated with equipment operation and maintenance to spill or otherwise be released on site will be addressed in the required Spill Plan. The Minnesota Duty Officer Program, established by Minnesota Department of Public Safety, provides a single answering point for local and state agencies to request state-level assistance for emergencies, serious accidents or incidents, or for reporting hazardous materials and petroleum spills. The duty officer is available 24 hours per day, seven days a week. The Spill Plan will have a contacts list.

21. Traffic. Parking spaces added: 0

Existing spaces (if project involves expansion):
Estimated total average daily traffic generated: 0

Estimated maximum peak hour traffic generated and time of occurrence: 0
Indicate source of trip generation rates used in the estimates.

Staff will use McCuen Street (Highway 39) to access the RTB site. Traffic will be generated when accessing, monitoring, and maintaining site and equipment. No dedicated parking areas

are planned. Travel on residential streets will be minimized. Traffic will be similar to the pre-project levels.

The alternative method proposed for this project has reduced the need for trucking the wood waste. Water-side excavation does not require access roads to transport equipment and move dredge materials off-site. The slurry pipe will transport materials along an existing right-of-way and will result in almost no transportation impacts. Transporting material in a slurry pipe helps to minimize impacts due to spillage or the need for re-handling of excavated materials between the project site and the dewatering facility.

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. Using the format and procedures described in the Minnesota Department of Transportation's Traffic Impact Study Guidance *(available at: http://www.oim.dot.state.mn.us/access/pdfs/Chapter%205.pdf)* or a similar local guidance, provide an estimate of the impact 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. N/A

22. Vehicle-related air emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts.

Diesel fuel exhaust emissions contain pollutants including carbon monoxide, nitrogen oxides, reactive organic gases, sulfur dioxide, and suspended particulate matter, all of which carry some associated health risks. At a maximum there will be in operation six diesel motors, including the pumps, excavators, and boosters. All equipment will have emissions controls that meet air quality standards. When in full operation, the emissions from the equipment will be local and limited. The site is sufficiently isolated from residential areas. Emissions will mix with surrounding air currents and largely dissipate before reaching known receptor sites.

23. Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality. N/A

24. Odors, noise and dust. Will the project generate odors, noise or dust during construction or during operation? _X_ Yes __ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

Material will be removed from the site using a water-based hydraulic dredge and pumped to a dewatering site located approximately one mile from RTB. Several diesel powered engines will be operating during construction. Project construction will continue for approximately 50 to 90 days. The operation is proposed to run continuously during day light and nighttime hours. The primary source of noise at RTB will be associated with the excavation activities. Noise will be generated by the operation of diesel-powered equipment, such as the hydraulic pump or the

mechanical excavator. Noise level generation during operation will likely be relatively persistent because equipment will constantly be excavating material.
The proposed project will create temporary occurrences of odors and dust during construction activities. The waste wood materials that will be moved will be in an aqueous state and are not a likely candidate for creating dust. There may be odors generated from the peat excavation as the organic material decomposes. However, any odors that are generated are expected to be minor and of short term duration. Most of the dredging zone will remain flooded during the duration of the project. If windy conditions are present, the odor will disburse readily. No long-term or persistent odor impacts are anticipated.

The noise generated by the diesel powered equipment is described below. *Minnesota Rules*, part 7030.0040 establishes two noise levels, L10 and L 50, based on the percent of time noise levels exceed the standard over a one-hour time period: L10 is defined as "noise levels exceeding the standard for 10 percent of the time for one hour (6 minutes/hour)" and L50 is defined as "noise levels exceeding the standard for 50 percent of the time for one hour (30 minutes/hour)." 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 1 includes residential areas. The only area near enough to the project area to be affected by noise disturbances will be the residential neighborhood located west of RTB, which is classified as NAC Level 1.

Noise standards established for NAC Level 1 areas are as follows (all noise levels are measured in decibels (dB): 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).

According to the Federal Highway Administration, the average noise level at 50 feet from typical diesel-powered equipment is 81 dB (FWHA Construction Noise Handbook). Sound decreases from a point source at a rate of 6 dB as the distance from the source doubles (MPCA Guide to Noise Control in Minnesota).

The table below provides an estimated noise level as a function of distance, based on information from the FHWA handbook and the MPCA guide.

Distance from Source (Feet)	**Noise Level (dB)**	**Notes/Reference point for RTB work**
0	87	Calculated from FHWA handbook
50	81	Average referenced for excavator/generator (FHWA handbook)
100	75	Calculated based on the MPCA guide
200	69	Calculated based on the MPCA guide
400	64	Calculated based on the MPCA guide
800	58	Most equipment operation in RTB will occur at distances at least 800 feet from the adjacent residential area
1,600	52	Representative of the furthest distance to the south and east that excavation will occur (in Operational Unit 1)

The closest residential area to the excavation activities is approximately 500 feet, with a majority of the activities occurring more than 800 feet from residential areas. Operational Units 1, 3, and

4, which represent approximately 70 percent of the excavation area, are located more than 800 feet away from receptor sites. At these distances, noise levels would likely be less than 58 dB, which is below the daytime L50 of 60 dB for NAC 1. However, noise levels for nighttime excavation in all Operational Units may exceed the NAC 1 nighttime L50 standard of 50 dB (Figure 2).

To bring nighttime operations into compliance with *Minnesota Rules* 7030.0040, the contractor will utilize sufficient noise arrestor devices on the equipment exhaust systems to lower noise below the 50 dB threshold. This is a common practice by dredge contractors when operating near residences or to achieve local noise standards. Further testing may be necessary if conditions warrant an evaluation. Noise and odors associated with equipment operation should be within background levels of the adjacent operating railroad and state highway transportation corridors.

No odor, noise, or dust impacts are anticipated at the dewatering site. The compost materials will be pumped into geotextile tubes for dewatering. The material will be stored in geotubes until used for beneficial purposes, i.e., land dressing or mulch, on an upland site within the AOC. The advantage of the geotextile tubes is the dredged material covered remains covered, which reduces the potential for dust problems or attracting birds. The risk of the stored organic debris of becoming a fire hazard is considered low.

25. Nearby resources. Are any of the following resources on or in proximity to the site?
Archaeological, historical or architectural resources? **X** Yes __No
Prime or unique farmlands or land within an agricultural preserve?__Yes **X** No
Designated parks, recreation areas or trails? **X** Yes__No
Scenic views and vistas? __Yes **X** No
Other unique resources? **X** Yes__No
If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

Archaeological, historical or architectural resources: In 2011, cultural resource investigations at RTB were conducted by Duluth Archaeology Center (Mulholland et al, 2011). Three types of historic properties were identified within the proposed excavation project area: 1) A railroad trestle/bridge, 2) Two sawmills, and 3) A radio station tower complex. Phase I field survey work included both a pedestrian walkover of the terrestrial part of the area of potential effect (APE) and an underwater survey (remote sensing and visual components) of the aquatic part. Physical remnants of historic properties include pilings from the Duluth and Winnipeg Railroad bridge/trestle (early 1890s to 1898); six of the seven bulky cement tower bases and a ground plane antenna system from the WREX AM radio station (1949-1953); and two sets of features from the Becklinger and Bowman and Richards and Pool (later Clark and Jackson) sawmills (1891-1899). One of the radio towers is still functional, serving an operating AM radio station. The tower array was grounded by an extensive wire grid system (ground plane antennae) buried in the mucky substrates of the bay (Figure 5).

The historic properties were considered for evaluation in terms of both structures and archaeological sites. None of them were recommended eligible for placement on the NRHP as a historic structure. The superstructure components of the former railroad trestle/bridge pilings are gone and no archaeological deposits associated with this property were identified. All superstructure components of the two sawmill properties are gone. They were considered potentially eligible as archaeological sites, although no test pits were examined. None of the towers of the original radio tower complex are present and one of the seven original tower bases

had been removed. A FM radio tower that is still active was placed at the site where the tower base was removed. The complex may be eligible as an archaeological site. The seven tower configuration at WREX was one of the first in the U.S. In addition, the ground plane antenna system and linear areas of gravel between the towers are still present on the bottom of the bay.

The railroad pilings were removed in winter 2012 following determination that the railroad bridge and trestle pilings were not eligible for the NRHP, removal of these structural remnants was not considered an adverse impact. No excavation or equipment access will be allowed in the vicinity of the sawmill foundations.

To prevent disturbance, the historical sites will be demarcated and mechanical excavation will be employed around the historical site to remove the woody debris. The waste materials will be moved outside of the historical site by amphibious excavation equipment for processing with the hydraulic dredge. A cultural resource professional will be present during excavation in this unit to identify any potential historic or archeological artifacts exposed during construction. The ground plane antenna system and gravel areas between the towers and radio tower bases will be left undisturbed. No adverse impacts are expected for these potentially historic features. The NOAA is facilitating coordination with the State Historic Preservation Office to determine whether SHPO concurs with MDNR that the project will have no effect on the historic properties.

Designated parks, recreation areas or trails: State Water Trails are recreational routes managed for canoeing, kayaking, boating, and camping in Minnesota. One of 33 designated trails, the St. Louis River State Water Trail, begins at Seven Beaver Lake in Superior National Forest, near Hoyt Lakes, Minnesota, and continues downstream for 200 miles, finally reaching Lake Superior. The trail passes near the RTB excavation area. The projection of noise from project activities will affect surface water users in proximity to RTB. The noise may discourage some users from using areas close to the project. The effect would be temporary and limited.

The active construction zone for excavating materials from RTB is approximately 1300 to over 1600 feet from River Place Campground and Dockage, a private campground facility, where 40 tent or RV camp sites are available for use. A river access is available for boaters.

The St. Louis Bay National Estuarine Research Reserve is located just across the thalweg of the St. Louis River in Wisconsin. The Reserve contains a large expanse of undeveloped land, some considered of wilderness quality, near Oliver and upstream of Superior, Wisconsin. The 16,697-acre Lake Superior Reserve is a combination of four distinct land areas and portions of connecting waterways in Douglas County, in the northwest corner of Wisconsin where the St. Louis River flows into Lake Superior. Each area possesses its own combination of habitats. The Reserve includes uplands and submerged lands; riparian and riverine habitat; riverine islands; emergent freshwater marshes, interdunal wetlands and scrub swamp; aspen, dry and hardwood forests; and open sand beach and dunes. The four non-contiguous areas are located within 10 miles of each other. The site consists exclusively of public lands and waters owned by Wisconsin Department of Natural Resources, City of Superior, Douglas County and the University of Wisconsin. The Reserve provides a wide range of research and public education opportunities.

Other Unique Resources: A railroad grade owned by the City of Duluth defines the north project limit of the bay. It has been used through a lease by a private individual for the occasional operation of a light duty, scenic rail tour. As a result of damage to a section of track not associated with this project sustained in the June 2012 flood, the scenic train has temporary ceased operation. Because the damage has not been repaired, the operation's future is uncertain.

26. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? **X** Yes __ No
If yes, explain.

The operation is proposed to run continuously during day light and nighttime hours. The lighting standards identified under the OSHA are specified for general construction areas, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas. A 3 foot-candle illumination level is the minimum requirement to meet safety standards for the construction zone (29 CFR 1926.56). Illumination of the excavation area has the potential to affect nearby residents.

The visual impacts affecting the closest residential neighbors should be minimal because households are situated on hills 30 feet above and more than 500 feet away from the excavation operations in the bay. Mature trees located between the site and the residential housing would help screen the area, reducing potential noise and light from reaching those receptor sites. There is one residence located on the hillside that has a view of the area. The existing tree line provides a visual buffer to mitigate the visual impacts. Visual impacts to this receptor site will be minor because the work will occur at a lower elevation and not within direct sight lines (Figure 4).

27. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? X Yes __No.
If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain

City of Duluth Comprehensive Plan (2006): The project site is part of the Western Planning Area for the City of Duluth. The land surrounding the bay is currently designated as undeveloped, low density residential, and warehouse/utility. The Duluth Comprehensive Plan characterizes the site as submergent marsh. The City's adopted comprehensive plan includes a future land use map, which guides the future development and conservation within the City of Duluth for a 20-year planning period. The RTB is in a designated Preservation Area, which includes lands with substantial restrictions, high natural resource or scenic value, or severe development limitations. These are primarily public lands, but limited private use is anticipated, subject to use and design controls. Examples of these land uses include most city parklands and primary viewsheds; shorelands of lakes, rivers, streams; wetlands and floodplains; high-value habitat; low-intensity private or public uses. The uses that work here include low intensity uses, such as trails; viewshed protection and access; and water access for fishing, canoeing, and kayaking, with limited parking. This wetland restoration project is compatible with the City of Duluth's future land use objectives.

The dewatering basin area is designated as General Mixed Use, with a Sensitive Lands Overlay along the shoreline. General Mixed Use is intended to encourage the broadest mix of uses, including light industrial, office, commercial, and residential use, with performance standards to ensure compatibility. This land use category includes areas transitioning from industrial uses and large redevelopments that require master plans and phased development. The Sensitive Areas Overlay is for high resource value lands or natural resources that may be developed under conservation design standards, transfer of development rights program designs, or low-impact performance standards. The overlay is intended to preserve natural qualities of the land or other important assets while allowing development to occur. The dewatering basin location is

compatible with this mixed use vision because low lying near shore areas are considered sensitive lands and not suitable for industrial reuse.

The proposed wetland restoration and the dewatering basin are both compatible with the City of Duluth Comprehensive Plan.

St. Louis River Habitat Plan (May 2002): The Habitat Plan was prepared to facilitate protection of the ecological diversity of the Lower St. Louis River. It sets forth conservation goals that represent an ecological ideal for the river. The intent of the plan is to set conservation goals that will achieve both ecological and social benefits.

The RTB is a sheltered bay on the St. Louis River. The Habitat Plan, which is an outcome of the St. Louis River AOC Stage 1 Remedial Action Plan and the delisting process, identifies sheltered bays as critical areas for biological diversity and ecosystem function, as well as remnants of high quality wetland habitat. Where sheltered bays have been impacted, the identified conservation goal is to undertake activities that bring them into a better ecological condition.

The proposed wetland restoration project is included in the Habitat Plan. The dewatering facility site's use is also compatible with the Habitat Plan. It is a temporary feature that is supportive of the long-term restoration of the site.

This project is compatible and integral with the comprehensive process required to delist the St. Louis River as an AOC. Completing this project will play a role in reaching improvements necessary for delisting the AOC delisting. The proposed project is also compatible with the current City of Duluth Comprehensive Plan. The excavation will remove the historical impact of wood waste on a shallow, sheltered bay in the estuary and contribute toward the delisting goals. Implementation of the proposed project will maintain the current land use designation of the wetland restoration area as submergent marsh and enhance the site's habitat value to fish and wildlife resources. The placement of the excavated material on the site for dewatering is compatible because the materials will be used for beneficial purposes to provide a suitable substrate for upland restoration planned for the larger property area.

28. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? _ Yes **X** No.
If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

29. Cumulative potential effects. Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement.

Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative potential effects. (Such future projects would be those that are actually planned or for which a basis of expectation has been laid.)

Describe 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 *(or discuss each cumulative potential effect under appropriate item(s) elsewhere on this form).*

The environmental effects of Phase 1 pilings removal completed in Radio Tower Bay in 2012, as

described in this EAW under Item No. 6e, were limited because operations were completed during winter months. No cumulative effects of the two projects are indicated.

This project is related to work being completed to delist the St. Louis River Estuary as an AOC. Other proposed AOC projects will be conducted to remove the beneficial use impairments identified for the St. Louis Bay environment (Figure 1). Many of the projects have not been advanced to the implementation phase but similar protocol will be required for their implementation, thus reducing potential environmental effects caused during implementation. Similar QAPP directives as defined for this project will provide guidelines for conducting project plans and operations. Many of the AOC projects will be required to undergo either the state or the federal environmental review processes, or both. The Mud Lake and Spirit Lake Projects are within several miles of RTB. The projects are still in the planning stages and have not been described enough to ascertain their environmental effects in relation to the proposed project. The US Steel Superfund site and associated cleanup operations also require QAPP, feasibility, and environmental review studies. The environmental effects of the Radio Tower Bay Wetland Restoration Project are largely isolated from the St. Louis River. Other projects proposed for the AOC will be difficult to isolate from the river using natural and artificial barriers or will involve much larger areas of remediation.

As identified under Item 6d in this EAW, this project along with other AOC projects are intended to restore the ecosystem services of St. Louis Bay and support the future delisting of the St. Louis River Estuary as an AOC. The projects will result in numerous benefits to the AOC. Completion of the AOC projects will reach the goal of restoring 1,700 acres of aquatic habitat in the St. Louis River AOC. Future AOC projects may rely on the use of material excavated from RTB as a soil amendment or biological media for the restoration of vegetative cover at other impacted upland sites or as clean material to create islands or other aquatic habitat within the bay.

Most of the cumulative potential effects of this project will be very beneficial to the longterm condition of the St. Louis Bay. Beneficial aspects of the proposed AOC projects include increased fish and wildlife habitat, increased fish and wildlife populations, and decreased anthropogenic impacts to St. Louis River Estuary. The goal is to delist the AOC and to continue improving the quality of habitats in the St. Louis Bay estuary. Many cumulative potential effects will be beneficial to the St. Louis River Estuary and lead to its delisting as an AOC.

The proposed project will have the following environmental effects that could combine with other projects to cause cumulative potential effects:

- Increased sedimentation in the St. Louis River. The risk of releasing large amounts of sediments into the St. Louis River is low. There is a low probability that a large storm event could displace the silt curtain enclosing RTB. When the silt curtain is operational, only minor amounts of sediment would migrate into the St. Louis River. The public water work permit will incorporate BMPS to prevent sediment from being released into the river.
- Increased level of noise surrounding the excavation zone. The machinery and equipment will be installed and calibrated to meet noise regulations for NAC Level 1 areas situated several hundred feet away from the site. Natural buffering is in place to prevent many receptors from the noise generated in RTB. Further testing would be conducted if residents voice disapproval of the nearby operation.

30. Other potential environmental impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No other potential environmental impacts have been identified.

31. Summary of issues. *Do not complete this section if the EAW is being done for EIS scoping; instead, address relevant issues in the draft Scoping Decision document, which must accompany the EAW.*

List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

There are no additional issues or effects identified in the EAW that may require further investigation prior to the construction of the project. No additional mitigative measures are being considered, other than those already outlined in the EAW.

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 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature

Date:

April 21, 2014

Title: Environmental Review Planner

Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at the Minnesota Department of Administration, Office of Geographic and Demographic Analysis. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-201-2492, or http://www.eqb.state.mn.us.