September 2021 version; Contains greenhouse gas quantification and assessment as well as adaptation and resiliency information

DRAFT, Revised
Environmental Assessment Worksheet

This most recent Environmental Assessment Worksheet (EAW) form and guidance documents are available at the Environmental Quality Board's website at**:** https://www.eqb.state.mn.us**/** The EAW formprovides information about a proposed project's potential environmental effects, and also used as the basis for scoping an Environmental Impact Statement. Guidance documents provide additional detail and links to resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can beaddressed collectively under EAW Item 21.

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 anEIS.

1. **Project title:** Kingsbury Bay Watershed Sediment Reduction Project

2. **Proposer:** MN Department of Natural Resources
   Contact person: Ben Nicklay
   Title: St. Louis River Project Manager
   Address: 525 Lake Ave #415
   City, State, ZIP: Duluth, MN, 55802
   Phone: 218-302-3242
   Email: ben.nicklay@state.mn.us

3. **RGU:** MN Department of Natural Resources
   Contact person: Becky Horton
   Title: Project Manager
   Address: 500 Lafayette Road
   City, State, ZIP: St. Paul, MN 55155
   Phone: 651-259-5122
   Email: becky.horton@state.mn.us

4. **Reason for EAW Preparation:** (check one)

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

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

   M.R., part 4410.1000 subpart4: Connected actions and phased actions

5. **Project Location:**

   - County: St. Louis
   - City/Township: City of Duluth
   - PLS Location (¼, ¼, Section, Township, Range):
     - Tributary 4 Sites: SE ¼, SW ¼, & SW ¼, SE ¼, Sec. 11, & NE ¼, NW ¼, & NW ¼, NE ¼, S14, T49N, R15W
     - Tributary 1 Sites: SW ¼, NW ¼, & SE ¼, NW ¼, & NW ¼, SW ¼, & NE ¼, SW ¼, & Govt Lot-2, SE ¼, S13, T49N, R15W
   - Watershed (81 major watershed scale): St. Louis River (AUID: 04010201-533)

September 2021 version; Contains greenhouse gas quantification and assessment as well as adaptation and resiliency information

- GPS Coordinates (decimal degrees):
  - Tributary 1 (68th Avenue West Creek): 46.72750, -92.18833 (Latitude 46° 43’ 39” N, Longitude 92° 11’ 18” W)
  - Tributary 4 (unnamed tributary to Kingsbury Creek): 46.73528, -92.20583 Latitude 46° 44’ 07” N, Longitude 92° 12’ 21” W
- Tax Parcel Number:
  - Tributary 4:
    - 010-2741-1040
    - 010-2745-00045
    - 010-2741-01076
    - 010-2745-00010
  - Tributary 1:
    - 010-4630-00810
    - 010-4630-01680
    - 010-4630-01560
    - 010-4630-01500
    - 010-4630-01480
    - 010-4630-01470
    - 010-0370-02110
    - 010-0370-04390
    - 010-0370-04270
    - 010-0370-04230
    - 010-2420-00290
    - 010-2420-00440
    - 010-2420-00240
    - 010-2420-00270
    - 010-2420-0028
    - 010-2420-1800
    - 010-2420-01530
    - 010-2420-01580
    - 010-2420-01570
    - 010-2420-01560
    - 010-2420-03580
    - 010-2420-03700
    - 010-2420-03780
    - 010-1783-00260
    - 010-2420-03570
    - 010-2420-03560

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

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

Attachment 1: Figures
- Figure 1: Project location map
- Figure 2: Topographic map
- Figure 3: Tributary 4 location map
- Figure 4: Tributary 1 location map
- Figure 5: Local geography and waterbodies map

Attachment 2: Project Designs

- List of data sources, models, and other resources (from the Item-by-Item Guidance: *Climate Adaptation and Resilience* or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project duringthe life of the project (as detailed below in item 7. Climate Adaptation and Resilience).

MN Climate Trends Map
MN Climate Explorer map
Flood Factor Tools
EPA's CREAT Climate Scenarios Projection map
EPA's Streamflow Projections Map
EPA Emission Factors for Greenhouse Gas Inventories
EPA, 40 CFR Part 98 – Mandatory Greenhouse Gas Reporting

6. Project Description:

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

The Minnesota Department of Natural Resources proposes to reduce erosion and improve stream connectivity in priority areas of the Kingsbury Creek and 68th Avenue West Creek watersheds in Duluth, Minnesota. The project will stabilize a total of 2,620 linear feet of stream, improve aquatic habitat, and address stormwater and culvert concerns.

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

removal or remodeling of existing structures, and 4) timing and duration of construction activities

The Minnesota Department of Natural Resources (DNR) proposes the Kingsbury Bay Watershed Sediment Reduction Project (Project) to reduce erosion and improve stream connectivity in priority areas of the Kingsbury Creek and 68th Avenue West Creek watersheds in Duluth. Project goals are to reduce sediment loads, stabilize stream channels, restore floodplain connectivity, improve aquatic habitat, and reduce the amount of sediment deposited in Kingsbury Bay. A subset of project designs are shown in Attachment 2.

The primary actions include:

- Regrade and install vegetated reinforced soil slopes (VRSS) to stabilize streambanks
- Install grade control structures to raise the channel grade so the stream has access to its floodplain
- Resize the channel to an appropriate shape and dimension
- Replace or remove culverts that are damaged or no longer function as intended
- Install a catch basin and tiling to address stormwater runoff and stop gully erosion

The Project will increase the resiliency of the recently completed Kingsbury Bay – Grassy Point project that removed large sediment deposits from Kingsbury Bay and restored open water and wetland habitat. Over many decades, the bay received high sediment loads from areas of excessive erosion and channel incision due to urban development in Kingsbury Creek and 68th Avenue West watersheds. Flood events over the past decades, highlighted by the June 2012 flood (less than one percent probability of exceedance), further degraded the watersheds and exacerbated erosion issues. The watersheds could take decades or longer to stabilize on their own, so restoration is needed to keep sediment stored in the watershed rather than ending up in Kingsbury Bay.

Sediment reduction in these watersheds meets the requirements to compensate the public for natural resource damages at the Interlake/Duluth Tar Superfund site as identified in the Saint Louis River Interlake/Duluth Tar (SLRIDT) Restoration Plan and Environmental Assessment. On behalf of the DNR, Barr Engineering Co. completed a feasibility study of these watersheds in 2019 that identified stream reaches and watershed areas contributing excessive sediment. Barr also provided conceptual plans for restoration or stabilization for fourteen projects, eight of which are addressed by this Project.

The Project is located on two streams in Duluth: 68th Avenue West Creek (Tributary 1) and an unnamed tributary to Kingsbury Creek (Tributary 4). Tributary 1 and Tributary 4 are part of the naming system used in the 2019 Feasibility Report and throughout the planning process, but they do not indicate their position in the watershed or other hydrologic significance. Tributary 1 has a drainage area of 0.16 square miles and is not a public water. Tributary 4 is a protected tributary to a designated trout stream and has a drainage area of 0.51 square miles. There are five construction sites on Tributary 1 (sites 1A-1E) (Attachment 2, pages 1 – 5) and two on Tributary 4 (sites 4A and 4B) (Attachment 2, pages 6 – 7). The total Project area is 11.07 acres and 2,620 feet of stream length however most of the Project acreage will not be disturbed. The width of disturbance along the stream ranges from 10 to 30 feet, with an average of 20 feet, and combined with the disturbance from access paths and the catch basin, total disturbance is only

2.63 acres.

The work largely consists of installing grade control structures, regrading and stabilizing stream banks, and enhancing vegetation in the riparian corridor. The stream channel will not be diverted, realigned, or channelized and the channel cross-section only altered in the immediate vicinity of grade control structures. In addition, three culverts on 68th Avenue West Creek will be addressed. A culvert in site 1A will be removed since it is causing bank erosion and no longer providing utility in an undeveloped city right of way (ROW). The end section of a site 1E culvert will be replaced since it has collapsed and is restricting stream flow. The third culvert drains stormflow at site 1E, but is damaged and causing gully formation. It will be repaired. Another component of the Project addresses stormwater from a residential community that currently flows down an eroding gully and contributes significant sediment to the stream at site 4A. It includes the installation of a catch basin and piping to collect stormwater and route it to the stream.

Anticipated equipment used during construction may include 330-class or smaller excavators, a bulldozer, marookas (tracked dump trucks), and a front-end loader. The smaller excavators and tracked vehicles will operate primarily along the streambank. Access trails have been located along existing roads and disturbed areas where possible (Attachment 2).

Silt fences, seeding and mulching, erosion control blankets, and other appropriate erosion control measures (such as working during low flow periods and limiting the amount of disturbed area and soils exposed at one time) will be incorporated into the construction phase of this project. As the Project construction progresses, disturbed sites will have the soil prepared for reseeding, be reseeded with appropriate vegetation, and be mulched to encourage rapid re-vegetation.

Construction is anticipated for summer 2022 and will take a total of 10-12 weeks with one crew. The exact timing and order of operations will be determined by the contractor, but project components are typically completed as they are encountered when working from upstream to downstream within a site. When more than one component are at the same location, channel shaping is usually completed first followed by the installation of grade control structures and rock riffles. Vegetated Reinforced Soil Slope (VRSS) installation typically occurs after the other channel work is completed. The order in which project sites are completed is also left up to the contractor with the exception that Tributary 4 sites need to be completed prior to the September 15th trout spawning restrictions. No ongoing work or maintenance is expected.

Project components:

Channel Shaping:

In areas where the stream is incised and lacks a floodplain, it will be reshaped to a dimension based on local stable streams, adjusted for differences in drainage area at the site. Reshaping involves moving on-site materials to match the elevations and profile in the plan specifications. It is typically done by an excavator operating alongside or in the channel while the stream is temporarily dewatered (the process for temporarily dewatering is described in Item 12) . For Tributary sites 1A and 1B, the stream cross sectional area will range from 4.5 to 6 square feet with a floodplain bench width of at least 6.9 feet. For

Tributary sites 1C–1E, cross sectional area will range from 6.7 to 7.2 square feet with a minimum floodplain bench width of 10.1 feet. For Tributary 4 sites, cross sectional area will be 10.1 square feet with a minimum floodplain bench width of 15.1 feet.

Grade Control Structures:

Cross vanes and j-hook boulder vanes are two grade control features that will be installed in the stream channel to help prevent incision, decrease near bank stress and bank erosion, and create a stable channel shape. The structures are constructed by configuring boulders in the channel bed so that flows are directed to the center of the channel and away from stream banks. The concentrated stream energy also creates a scour pool below the structure, enhancing fish habitat. Cross vanes (see Attachment 2, page 10) span the entire channel and typically are in the shape of an arch with the apex upstream while j-hooks span two thirds of the channel with the hook pointing upstream (see Attachment 2, page 8). They are typically constructed by an excavator operating alongside or in the channel while the stream is temporarily dewatered. There are 106 grade control structures planned for the Project, with most being installed in sites 1A and 1B. Boulders will be brought in from a local source. Boulders may be utilized if available onsite at Tributary 1 sites only.

Rock Riffles:

Rock riffles are composed of a specified mixture of fine and mostly coarse substrates that help stabilize the channel bottom and create channel complexity for aquatic organism habitat. Once the channel is shaped, the mixture is added on the top of the substrate as specified in the plans. They are typically constructed by an excavator operating alongside or in the channel while the stream is temporarily dewatered. These structures help stabilize the steepest parts of the stream and typically tie into a grade control structure at their end. They are also designed to have an inner berm, a narrow deeper area the length of the structure that keeps low flows concentrated so that they maintain better depth for fish cover. There are 52 rock riffle structures in the Project with a total length of 566 feet.

Vegetated Reinforced Soil Slope (VRSS):

To protect streambanks, VRSS will be installed in areas that are susceptible to erosion or subjected to erosive currents, such as the outside bank of meanders. VRSS uses rip rap to protect the toe of the bank up to the normal water surface level (Attachment 2, page 9). From there, it uses layers of fill, gravel, and topsoil wrapped in a biodegradable woven coconut mesh that protects the substrates until vegetation takes root. Live stakes and shrubs are incorporated into the structure to acceleration revegetation. Approximately 800 feet of VRSS will be installed in 15 sections.

Project Sites:

Tributary 1

Site1A:

This site (Attachment 2, page 1) is located at the west end of Redruth Street. It is the most upstream Tributary 1 site and contains very steep stream slopes ranging from 4-7%. The channel is also very incised with little floodplain. Thirty-one cross vanes along with 21 rock riffles (197 linear feet) will be constructed. The stream bed elevation will be raised up to 4 feet to connect it to an existing floodplain or to a created floodplain as part of the channel shaping process. The channel will be raised by adding fill material to the channel bottom until it meets the elevation

specified in the plans. Streambanks will be graded along the entire stream length and 80 linear feet of VRSS will be installed. A failing culvert west of Redruth Street that is no longer needed will be removed and disposed of. The new channel will tie back into the existing stream grade upstream of the culvert running underneath the Duluth Winnipeg, and Pacific (DWP) Trail. No work is proposed for that culvert and the DWP is outside the Project boundary.

Site 1B:
Site 1B (Attachment 2, page 2) is located downstream of the DWP trail and the primary concerns are channel incision and a lack of floodplain access. The channel is still steep, with an average slope of 3.4%, so forty-three cross vanes and 24 rock riffles (202 linear feet) are proposed at this site. It will also be lifted up to 3 feet to allow floodplain access. Streambanks will be regraded along the entire site length and 140 linear feet of VRSS will be installed.

Site 1C:
Site 1C (Attachment 2, page 3) is located to the northwest of the intersection of South 71st Avenue West and Waseca Street. The two goals at this site are to stabilize two small eroding gullies with grade control structures and to stabilize a five-foot head cut with a series of grade control structures and rock riffles to spread the drop out over 100 feet. The resulting slope will still be 7%. Some additional floodplain will be created but space is limited due to the terrain and nearby infrastructure. In total, seven cross vanes will be installed as well as 80 linear feet of VRSS and 72 linear feet of rock riffle. The construction will not affect the culvert going under the street intersection.

Site 1D:
Site 1D (Attachment 2, page 4) is located southeast of the intersection of South 71st Avenue West and Waseca Street and northwest of the culvert under Highway 23. The stream is not as incised here and less steep (2.3%). A 20 foot wide by 200 foot long corridor will be regraded to reshape the channel, create floodplain, and lessen the slope of streambanks. Two j-hook structures and two cross vanes will be installed to provide grade control and keep flows directed to the center of the channel. Two sections of VRSS will be installed totaling 70 linear feet. The construction will not impact the culverts upstream or downstream of the site.

Site 1E:
Site 1E (Attachment 2, page 5) is located southeast of South 69th Avenue West and is downstream of a large culvert system that conveys the stream and local stormwater. The culvert crosses under Highway 23, several businesses, and a Burlington Northern Santa Fe (BNSF) rail line. The culvert outlet has collapsed and will be replaced during construction. A second culvert that conveys stormwater under S 69th Avenue West is damaged and causing erosion as it flows down a steep hill to the stream. This culvert will be repaired and extended so that it discharges at stream grade onto rip rap. In addition, a 20 foot wide by 170 foot long corridor along the stream will be graded to reshape the channel and streambanks to allow for more floodplain. The stream slope will stay at roughly 0.5%. Two j-hook and two cross vane grade control structures will be installed.

Tributary 4
Site 4A:

Site 4A (Attachment 2, page 6) is in a deep forested valley to the southeast of the Zenith Terrace residential community. The narrow valley restricts where floodplain can be created and how much some steep streambanks can be graded back. Stream slopes range from 2.6% to 3.7%. Grade control structures will be installed at key locations to help raise the channel or to help protect vulnerable streambanks. In total, two j-hooks and four cross vanes will be installed. Streambanks will be graded back over 250 linear feet and VRSS installed on another 250 linear feet. Two rock riffles will also be installed on 55 linear feet.

Stormwater from the Zenith Terrace community has created an eroding gully down the 30 foot hillside to the stream. A catch basin will be installed in a previously disturbed area on top of the hill and the stormwater transported down to the stream through piping. Rip rap will be placed to stabilize the gully and protect the outlet from erosion.

Site 4B:
Site 4B (Attachment 2, page 7) is located about 200 feet downstream of the Tributary 4A site and just upstream of the Kingsbury Creek mainstem. Stream slopes in this reach range from 3.8% to 6.1%. Approximately 120 linear feet of stream bed and bank will be graded to reshape the channel and provide floodplain. Vegetated Reinforced Soil Slope will be installed on 170 linear feet of bank and two rock riffles totaling 40 linear feet. Additionally, a 2,500 square foot area adjacent to the stream below a waterfall will be graded to provide floodplain and keep the streamflow concentrated in one channel. Rocks and woody debris will be placed in this area to provide roughness that helps slow flood flows and divert them back to the channel.

c. Project magnitude:

Description	Number
Total Project Acreage	11.07
Total Project Disturbed Acreage	2.63
Linear project length	2,620 feet
Number and type of residential units	N/A
Residential building area (in square feet)	N/A
Commercial building area (in square feet)	N/A
Industrial building area (in square feet)	N/A
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	N/A

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

The purpose of the Project is to reduce erosion and keep sediment stored in the watershed rather than being transported downstream and deposited in Kingsbury Bay. It will increase the resiliency of the DNR's recently completed Kingsbury Bay – Grassy Point Habitat Restoration Project that removed approximately 120,000 cubic yards of sediment from Kingsbury Bay and restored open water and wetland habitat. The Kingsbury Bay – Grassy Point Project is an important part of delisting the St. Louis River Area of Concern as identified in the Habitat Plan

and Roadmap to Delisting ((St. Louis River Citizens Action Committee 2002) (WDNR and MPCA 2016)). The St. Louis River was federally listed as an Area of Concern due to legacy pollution and habitat degradation that led to significant impairment of beneficial uses. The Kingsbury Bay – Grassy Point Project will help to remove the beneficial use impairments so the river can be delisted. Like the Project, the work in Kingsbury Bay was also implemented as part of the Natural Resources Damages Assessment settlement for the SLRIDT Superfund Site.

Furthermore, the Kingsbury Creek mainstem is impaired for aquatic life, with both fish and macroinvertebrates assessments falling below the standard for coldwater streams. The Minnesota Pollution Control Agency (MPCA) Stressor ID report identified total suspended solids as a stressor to the fish communities (MPCA 2016). A total maximum daily load (TMDL) was completed on Kingsbury Creek for Total Suspended Solids (TSS) to address the biological impairments and was approved by U.S. EPA in 2020. The Project has the potential to reduce streambank erosion by 150 tons/year in Tributary 4 and 250 tons/year in Tributary 1, though Tributary 1 does not flow into Kingsbury Creek.

The Project will be carried out by the DNR and benefit the inhabitants of the aquatic and riparian ecosystems, as well as nearby residents and the citizens of Duluth with better aesthetics. The Zenith Terrace community will also benefit from the improvements to their stormwater management.

e. Are future stages of this development including development on any other property planned orlikely to happen? ☒ Yes ☐ No
If yes, briefly describe future stages, relationship to present project, timeline and plans forenvironmental review.

Barr's 2019 feasibility study identified fourteen priority projects to reduce sedimentation in the Kingsbury Creek and 68th Avenue West Creek watersheds. The eight projects addressed by this project were selected by resource managers to maximize sediment reductions with available funding. The DNR and other partners desire to complete the remaining six sediment reduction projects in the future. The remaining future projects are all in the Kingsbury Creek watershed and would be similar in scope to this project with the possible addition of stream re-meandering. One future project includes stabilizing a slumping bluff on the Kingsbury Creek mainstem. The South Saint Louis Soil and Water Conservation District has expressed an interest in restoring another future project along the Proctor Golf Course, but work is still likely a few years away. Funding would have to be found for any future projects and at the time of this writing, no additional planning has occurred.

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

While this project achieves multiple benefits by making the watersheds more stable and resilient, it would not be such a high priority if not for the large restoration project completed in Kingsbury Bay. The project removed approximately 120,000 cubic yards of sediment from Kingsbury Bay and restored open water and wetland habitat for fish and wildlife. Boating and fishing opportunities improved in the bay as well. However, without addressing the sources of sediment, the bay is susceptible to filling in again.

The DNR completed an EAW for the Kingsbury Bay Restoration Project in 2018. On May 30, 2018, a Record of Decision was issued with a determination that an Environmental Impact Statement was not required. Construction of the Kingsbury Bay Restoration Project commenced in summer 2019 and was completed in fall 2021 after three seasons of work.

7. Climate Adaptation and Resilience:

a. Describe the climate trends in the general location of the project (see guidance: *Climate Adaptation and Resilience*) and how climate change is anticipated to affect that location duringthe life of the project.

All project construction activities will take about three months, but Project areas will be left as is once construction activities are complete. Climate trends for the area point to overall warmer temperatures, especially daily low temperatures. While estimates for precipitation and changes in streamflow vary, they generally point to more precipitation and higher streamflow. The Project will not be impacted by (or contribute to) changes in ambient air temperature due to climate change. Stream temperatures may rise with warmer air temperatures, but the Project will not have an effect on this. Future increases in precipitation and intense storms pose a risk of increased erosion and streambank failure to Project areas but the risk will be lower than if the Project were not completed. A stable channel that is connected to a floodplain should be more resilient to future floods.

The Minnesota Climate Trends tool provides historical temperature and precipitation data going back as far as 1895. The information summarizes annual trends from 1895 through 2021 for the North Shore Highlands Ecological Subsection (MNDNR, n.d.-a).

- Average daily mean temperatures have increased by 0.22°F per decade, with the trend rising from 35.8°F to 38.5°F.
- Average maximum temperatures have increased by 0.16° per decade, with the trend rising from 46.8°F to 48.7°F.
- Average minimum temperatures have increased by 0.28°F per decade, with the trend rising from 24.9°F to 28.3°F.
- Average annual precipitation has increased by 0.31 inches per decade, with the trend rising from 26.6 inches to 30.4 inches.
- The Palmer Drought Severity Index is calculated by month rather than annually. For each month, the Index has risen has increased by an average 0.15 per decade, which suggests fewer and/or less intense droughts.

The Minnesota Climate Explorer Tool provides climate projections of temperature and precipitation using several climate prediction models for three different time periods and different greenhouse gas concentrations (MNDNR n.d.-b). The following tables show the range of outcomes for the North Shore Highlands Ecological Subsection.

Table 1. Average daily mean temperature (°F)

	Lower Range	Mean	Median	Upper Range
1980-1999 Modeled Present	36.0	38.6	38.4	41.8
2040-2059 Mid-Century (RCP 4.5)	39.6	42.3	42.0	46.1

2080-2099 Late-Century (RCP 4.5)	40.3	44.3	44.3	47.8
2080-2099 Late-Century (RCP 8.5)	45.2	48.2	48.1	51.7

Table 2. Average annual precipitation (Inches)

	Lower Range	Mean	Median	Upper Range
1980-1999 Modeled Present	16.5	31.6	28.2	62.4
2040-2059 Mid-Century (RCP 4.5)	16.4	31.2	27.8	70.0
2080-2099 Late-Century (RCP 4.5)	17.1	36.5	32.3	75.8
2080-2099 Late-Century (RCP 8.5)	19.8	39.0	33.8	90.9

The Flood Factor tool provides future flood risk ratings relative to other US communities along five categories: residential properties, commercial properties, roads, infrastructure, and social services (Flood Factor n.d.). Tributary 4 is an area with moderate risk while Tributary 1 is in an area of major risk. Several homes are identified along Tributary 1 as having major or severe risk. The tool also shares that extreme precipitation events are expected to increase 0-5% in the next 15 years and 5-10% in the next 30 years, compared to the 1980-2010 average.

The EPA's CREAT Climate Scenarios Tool shows changes to precipitation and storm intensity given different future climate scenarios (US EPA, n.d.-a). Relevant information from the tool is shown in Tables 3 and 4.

Table 3. Short- and long-term change in average annual precipitation under different climate scenarios.

	Hot/Dry	Central	Warm/Wet
2035	0.3%	4%	8.4%
2060	0.5%	7.9%	16.3%

Table 4: Short- and long-term change in 100-year storm intensity under different climate scenarios.

	Stormy	Not as Stormy
2035	11.2%	1.7%
2060	21.8%	3.4%

The EPA's Streamflow Projections Map shows potential future streamflow changes under different future environmental conditions (US EPA n.d.-b). Relevant information from the map is shown in Tables 5, 6, and 7.

Table 5. Changes in annual daily average streamflow calculated as a ratio of the projected future flow (2071-2100) divided by baseline historical flow (1976-2005).

	Average Streamflow Ratio
Wetter projection (90th percentile)	1.23
Drier projection (10th percentile)	0.82

Table 6. Changes in low streamflow calculated as a ratio of the projected future flow (2071-2100) divided by baseline historical flow (1976-2005). Annual low is the average lowest single day

streamflow. The 2-year low is the 7-day low flow which as a 50% probability of occurring in any given year. The 10-year low flow is the 7-day low flow which has a 10% probability of occurring in any given year.

	Annual Low	2-Year Low	10-Year Low
Wetter (90th percentile)	1.01	1.05	0.99
Drier (10th percentile)	0.81	0.9	0.88

Table 7. Changes in annual daily high streamflow calculated as a ratio of the projected future flow (2071-2100) divided by baseline historical flow (1976-2005).

	Average Streamflow Ratio
Wetter (90th percentile)	1.3
Drier (10th percentile)	0.78

b. For each Resource Category in the table below: Describe how the project's proposed activities and how the project's design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

Resource Category	**Climate Considerations (as identified above in 7a)**	**Project Information (what features of this resource category address addresses vulnerabilities because of/due to climate the climate trend)**	**Adaptations (effect on that feature)**
Project Design	• Climate trends for the general location predict a warmer and wetter climate with more frequent and higher intensity storm events.	Climate change risks and vulnerabilities identified include: • Large floods (especially during and shortly after construction) could cause new bank failures and erosion.	• The design is expected to make the stream more resilient to future storm events and increased precipitation by creating a stable channel, creating floodplain access, and repairing or removing damaged culvert infrastructure. • Best Management Practices (BMPs) will be followed during construction to minimize risks.

Resource Category	**Climate Considerations (as identified above in 7a)**	**Project Information (what features of this resource category address addresses vulnerabilities because of/due to climate the climate trend)**	**Adaptations (effect on that feature)**
Land Use	• Climate trends for the general location predict a warmer and wetter climate with more frequent and higher intensity storm events.	Climate change risks and vulnerabilities identified include: • The Project will not be changing land use or increasing the amount of impervious surface	• The Project is expected to make the stream more resilient to future storm events and increased precipitation by creating a stable channel, creating floodplain access, and repairing or removing damaged culvert infrastructure. • Disturbed areas will be covered with erosion control blanket and reseeded soon after construction is completed to reduce the time bare soils are exposed.
Water Resources	• Climate trends for the general location predict a warmer and wetter climate with more frequent and higher intensity storm events.	• Reshape channel and stabilize streambanks • Remove or repair damaged culvert infrastructure • Create floodplain access • Address stormwater runoff at the Zenith Terrace residential community	• The Project stabilizes the stream channel making it more resilient to climate change impacts • Removes climate change vulnerabilities by addressing damaged culverts and stormwater runoff
Contamination/ Hazardous Materials/ Wastes	• Climate change predictions are not anticipated to influence the potential environmental effects of generation/use/storage of hazardous waste and materials.	Climate change risks and vulnerabilities identified include: • Not Applicable	• Not Applicable

Resource Category	**Climate Considerations (as identified above in 7a)**	**Project Information (what features of this resource category address addresses vulnerabilities because of/due to climate the climate trend)**	**Adaptations (effect on that feature)**
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	• Climate trends may result in changes in the distribution of fish, wildlife, and plants. Warmer climate trends may result in more available habitat for invasive species.	• Heat stress and/or drought could make reestablishing vegetation difficult following construction • Transportation and spread of invasive species to the project area and disruption of fish and wildlife	• Disturbed areas will be covered with erosion control blanket and reseeded with natives along with a cover crop soon after construction is completed to reduce the time bare soils are exposed. • Efforts to mitigate the transport and spread of invasive species will be implemented (and are discussed in detail in Section 14).

8. Cover types: Estimate the acreage of the site with each of the following cover types before and afterdevelopment:

Cover Types	**Before (acres)**	**After (acres)**
Wetlands and shallow lakes (<2 meters deep)	0.38	0.38
Deep lakes (>2 meters deep)	0	0
Wooded/forest	7.88	7.88
Rivers ~~and~~/streams	0.23	0.23
Brush/Grassland	0.11	0.11
Cropland	0	0
Livestock rangeland/pastureland	0	0
Lawn/landscaping	0	0
Green infrastructure TOTAL (from table below*)	0	0
Impervious surface	0	0
Stormwater Pond (wet sedimentation basin)	0	0
Other (Developed)	2.47	2.47
TOTAL	11.07	11.07

Green Infrastructure*	Before (acreage)	After (acreage)
Constructed infiltration systems (infiltration basins/infiltration trenches/ rainwater gardens/bioretention areas without underdrains/swales with impermeable check dams)	0	0
Constructed tree trenches and tree boxes	0	0
Constructed wetlands	0	0
Constructed green roofs	0	0
Constructed permeable pavements	0	0
Other (describe)	0	0
TOTAL*	0	0

Trees	**Percent**	**Number**
Percent tree canopy removed or number of mature trees removed during development	6.8	N/A
Number of new trees planted	N/A	0

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

Unit of Government	Type of Application	Status
United States Army Corps of Engineers (USACE)	River and Harbors Act, Section 10 Clean Water Act Section 404 Permit	Possibly Needed To be submitted
DNR	Public Waters Work Permit	To be submitted
Minnesota State Historic Preservation Office (SHPO)	Archaeological, Cultural, and Historic Resource Review	Complete
Minnesota Pollution Control Agency (MPCA)	Clean Water Act 401 Certification NPDES/SDS Construction Stormwater Permit State Disposal System Permit	To be submitted Possibly Needed Possibly Needed
City of Duluth	Filling/Grading/Excavation Permit Wetland Conservation Act Erosion and Sediment Control Permit Shoreland Permit Temporary Access Agreement/License	To Be Submitted To Be Submitted To Be Submitted To Be Submitted In Process

Unit of Government	Type of Application	Status
St. Louis County	Temporary Access Agreement/Permit	In Process
Minnesota Power	Temporary Access Agreement	In Process
BNSF	Temporary Access Agreement	To Be Submitted by Contractor
Private Landowners	Temporary Access Agreement	Some in process, some complete

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos.10-20, or the RGU can address all cumulative potential effects in response to EAW Item No.22. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 21.

10. Land use:

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

The Tributary 4 sites are mainly forested and either owned privately or by the State of Minnesota. The Zenith Terrace residential community is located to the northwest of site 4A. An open area within the project boundary is used by the residential community as a storage and maintenance area (see Figure 3). This area will be used for staging during the Project and is also where the catch basin will be constructed (see Attachment 1, page C-31). To the west of site 4B is a Minnesota Department of Transportation (MNDOT) maintenance yard where construction crews will access the stream from. A Minnesota Power high voltage transmission line also crosses the 4B project area. There is no infrastructure for public recreation at either 4A or 4B. However, there are major transportation corridors to the southwest and east; US Highway 2, Skyline Drive, Interstate 35, and a Canadian National Railway line.

The Tributary 1 sites include private land as well as land managed by St. Louis County (tax forfeit) and the City of Duluth, including undeveloped rights of way (ROW's). Much of the land is undeveloped forest to the northwest of site 1A, but the stream enters a narrow riparian corridor as it flows southwest through the Fairmount residential neighborhood on its way to Kingsbury Bay. In addition to the residential neighborhoods, there are several commercial mixed-use zones along Highway 23 and a BNSF rail line between sites 1D and 1E.

Many recreational opportunities exist in the greater area of Tributary 1. Fairmont Park, the Lake Superior Zoo, Indian Point Park, and the Indian Point Campground are located to the southwest of the stream while several sections of the Western Waterfront Park exist along the St. Louis River waterfront. The Superior Hiking Trail, a natural surface trail used year-round by hikers and snowshoers, crosses the upper watershed of 68th Avenue West Creek. The Thompson Hill Trail, utilized by snowmobiles in winter, also crosses upper watershed of 68th Avenue West Creek. The paved multi-use DWP and Duluth Traverse trail crosses 68th Avenue West Creek between project sites 1A and 1B and is utilized year-round by walkers, runners, skaters, and bikers. The

Waabizheshikana Trail is a natural surface trail utilized year-round by walkers and bikers that crosses 68th Avenue West Creek before it enters Kingsbury Bay. No facilities exist adjacent to project sites, but several assisted living facilities, schools, and churches are located within a half mile of the project sites. Some industrial areas are also within a half mile of the Project, located along the St. Louis River to the northeast and southwest.
There are not prime or unique farmlands in the general area of the Project.

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

City of Duluth Comprehensive Land Use Plan
Duluth's Comprehensive Land Use Plan *Imagine Duluth 2035* (City of Duluth 2018) emphasizes people and their connections to natural places. The plan identifies future land use for both stream riparian corridors as open space with the surrounding communities designated traditional neighborhoods, low-density neighborhoods, and urban residential.

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

The Project is compatible with the following local zoning and overlay districts:

Floodplain and Shoreland Management
Neither stream has a FEMA mapped floodplain. The City of Duluth shoreland management zones specify development setback standards that apply to shorelands within 1,000 feet of Lake Superior or within 300 feet of rivers, creeks, streams, and tributaries. The three zone types are general development waters, natural environmental waters, and coldwater rivers with general development waters being the least restrictive and coldwater rivers being the most restrictive. For example, structures in general development waters, natural environmental waters, and coldwater rivers must be set back 50 feet, 75 feet, and 150 feet, respectively. The upper half of Tributary 1 is zoned natural environment waters and the lower half is zoned general development. Tributary 4 is zoned as coldwater rivers.

City of Duluth Zoning
Residential-Traditional (R-1) – The R-1 district is established to accommodate traditional neighborhoods of single-family detached residences, duplexes and townhouses on moderately sized lots. This district is intended to be used primarily in established neighborhoods. Many of the dimensional standards in this district require development and redevelopment to be consistent with development patterns, building scale, and building location of nearby areas. Site 4A and all Tributary 1 sites include R-1 zoning.

Residential-Rural (RR-1) – The RR-1 district is established to accommodate large-lot, single-family detached residential uses, typically surrounded by significant open space, on lots of at least 5 acres each. The district encourages distinctive neighborhoods with a semi-rural character. Complimentary uses such as limited agriculture, small-scale institutional uses, parks, minor utilities, and certain other temporary uses are allowed. Site 1A and both Tributary 4 sites include RR-1 zoning.

Residential-Urban (R-2) – The R-2 district is established to accommodate multi-family apartments and townhouses, in an urban setting. This district also allows for single-family detached dwellings, duplexes, and group living accommodations. The district is intended primarily for locations closer to commercial and mixed-use activity centers, and may serve as a transition between lower-density residential areas and more intense commercial and mixed use neighborhoods. Sites 1B and 1D include R-2 zoning.

Rural-Conservation (R-C) – The R-C district is established to accommodate low-density, single-family detached residential uses on parcels of at least ten acres each in areas where the comprehensive land use plan calls for protection of rural character. The district encourages development designs that conserve open space and natural resources and preserve rural character. Complimentary uses such as limited agriculture, parks, minor utilities, and certain temporary uses are allowed with restrictions. Only site 1E has R-C zoning.

Other
Neither stream is designated as a wild and scenic river or critical area.

iv. If any critical facilities (i.e. facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding,describe the risk potential considering changing precipitation and event intensity.

Neither stream has FEMA mapped floodplains, and the proposed work should help mitigate some future increases in precipitation and flooding by reconnecting these areas with their floodplain to allow excess flows to spread out and dissipate energy. The Project does not propose any facilities or hazardous material storage.

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

The Project is compatible with Duluth's comprehensive plan as well as adjacent land use and zoning. It will not change the current or future land use. A stable and functioning stream should increase the aesthetics of both undeveloped forests and residential communities.

b. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above and any risk potential.

There are no known incompatibility issues due to Project implementation. While work will take place in the streambed and along the streambank, the Project will meet shoreland zoning ordinances, as defined in the Duluth shoreland standards. Restoring the stream to a more stable channel will reduce erosion and sedimentation downstream to Kingsbury Bay. A more stable channel will be more resilient to future storm and flood events.

11. Geology, soils and topography/land forms:

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

The Duluth Complex subtype of gabbro to troctolite form the bedrock geology of these watersheds. The Natural Resource Conservation Service (NRCS) Web Soil Survey indicates that the depth to bedrock is less than three feet at Tributary 4 and more than six feet for Tributary 1. Based on the underlying geology, there are no areas within the Project that are susceptible to sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. No karst features are mapped within the proposed Project area. No effects on geological features are anticipated from the Project.

b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highlypermeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed inresponse to Item 12.b.ii.

The Custom Soil Resource Report provided by the NRCS identifies the soils in the Project areas as the following:

- F159D – Urban land-Ameek-Normanna complex
  - 3-18% slopes
  - fill material from surrounding uplands, gravel pits, and blasted bedrock
- F148F – Ahmeek-Rock outcrop-Fluvaquents, frequently flooded, complex
  - 0-50% slopes
  - loamy material over dense loamy till parent material
- GP – Pits, gravel-Udipsamments complex
  - sandy and gravelly outwash parent material
- E16D – Amnicon-Cuttre-Rock outcrop complex
  - 0-8% slopes
  - loamy material over dense loamy till parent material
- E18B – Urban land-Cuttre-Rock outcrop complex
  - 0-8% slopes
  - fill material from surrounding uplands, gravel pits, and blasted bedrock
- E9E – Miskoaki-Fluvaquents, frequently flooded complex
  - 0-45% slopes
  - clayey till parent material

Soil types F148F, E16D, and E9E are classified as 'D' hydrologic soils, which exhibit slow infiltration and high runoff potential. All soil types listed are rated as severe in the NRCS Erosion Hazard for unpaved roads/trails and the Soil Rutting Hazard. They also have medium susceptibility to compaction. Additional information is available in the NRCS Custom Soil Resource Report (Attachment 8).

An estimated 590 cubic yards of rock material will have to be imported to the Project sites. The estimated total fill (not including riprap/boulder structures) is 460 cubic yards, and the total cut is 110 cubic yards. Grading is expected to occur over 1.58 acres. Soil erosion control measures will be utilized during and after construction to prevent unnecessary erosion and stabilize disturbed slopes and stream banks until new vegetation takes hold. Construction vehicle traffic will be confined to a minimal number of access roads and routes to prevent widespread rutting and soil compaction. The contractor will not work during large rain events and will minimize impacts to soils susceptible to rutting. Access paths and areas that may have experience soil compaction can be tilled at the end of construction to loosen soils.

- NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 12 must be consistent with thegeology, soils and topography/land forms and potential effects described in EAW Item 11.

12. Water resources:

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

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

The Project involves restoration work on two streams that drain to the St. Louis River at Kingsbury Bay. The first stream is an unnamed tributary to Kingsbury Creek (S-002-003-001)(Tributary 4) that is a public water, protected tributary to a trout stream, and is designated as a cold water shoreland zone. It flows into Kingsbury Creek (S-002-003) which is a public water and designated trout stream. Kingsbury Creek is designated cold water shoreland zone and has a FEMA mapped floodplain. The second stream is 68th Avenue West Creek (Tributary 1) which is not a public water but has both natural environment and general development shoreland zones. 68th Avenue West Creek flows directly into Kingsbury Bay. The St. Louis River (S-002) is a public water with a mapped floodplain and designated general development shoreline zone. It is also an area of Minnesota Biological Survey site of moderate biodiversity significance, a DNR lake of outstanding biological significance and a wild rice lake identified by DNR Division of Wildlife staff. There are many documented invasive species present in the St. Louis River including Alewife,

Common Carp, Eurasian Ruffe, Freshwater Drum, Round Goby, Three-spine Stickleback, White Perch, spiny water flea, snails, quagga and zebra mussel. Current water quality impairments within one mile of the Project are shown in the table below.

Table 8. MPCA Draft 2022 Impaired Waters List [Section 303(d) of the Clean Water Act]

Reach Name	Reach Description	Year Added to List	Stream/River Segment ID	Affected Designated Use	Pollutant or Stressor
Keene Creek	Headwater to St. Louis River	2012	04010201-627	Aquatic Recreation	Escherichia coli
Keene Creek	Headwater to St. Louis River	2022	04010201-627	Aquatic Life	Chloride
Kingsbury Creek	Mogie Lake to St. Louis Bay (SLB)	2012	04010201-626	Aquatic Life	Benthic macroinvertebrates bioassessments
Kingsbury Creek	Mogie Lake to SLB	2022	04010201-626	Aquatic Life	Chloride
Kingsbury Creek	Mogie Lake to SLB	2012	04010201-626	Aquatic Life	Fish bioassessments
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	2002	04010201-501	Aquatic Consumption	DDT
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	2002	04010201-501	Aquatic Consumption	Dieldrin
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	2002	04010201-501	Aquatic Consumption	Dioxin (including 2, 3, 7, 8-TCDD)
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	1998	04010201-501	Aquatic Consumption	Mercury in fish tissue
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	1998	04010201-501	Aquatic Consumption	Mercury in water column
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	1998	04010201-501	Aquatic Consumption	PCB in fish tissue
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	1998	04010201-501	Aquatic Consumption	PCB in water column
St. Louis River (SLB)	Pokegama R to Mouth of SLB at Blatnik Bridge	2002	04010201-501	Aquatic Consumption	Toxaphene

Reach Name	Reach Description	Year Added to List	Stream/River Segment ID	Affected Designated Use	Pollutant or Stressor
Stewart Creek	T49 R15W S21, west line to SLB	2012	04010201-884	Aquatic Recreation	Escherichia coli

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells,including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

Depth to groundwater varies across the Project sites. At the Tributary 1 sites, groundwater depth can be within 2 feet of the surface. At site 4A, groundwater is over 50 feet below the surface while it is only over 10 feet below the surface at site 4B.

The Project is not in a MDH wellhead protection area and the MDH Well Index identifies no wells within the project boundaries. There is one domestic well (ID 274095) approximately 800 feet to the south and across US Highway 2 from Tributary 4 sites. There is also an unverified well (ID 172062) and three sealed wells (IDs 531804, 531806, and 531806) roughly 500 feet and 1,500 feet respectively to the northeast of the Tributary 1 sites. The well logs are included Attachments 2-6. There are numerous wells about a half mile and further from the Project sites.

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

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

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

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for sucha system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigateimpacts. Discuss any effects to surface or groundwater from wastewater discharges,taking into consideration how

current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.

The Project will not generate or release wastewater during construction or operation.

ii. Stormwater - Describe changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction including how the project will affect runoff volume, discharge rate and change in pollutants.Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments orare classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

Tributary 1 and Tributary 4 both drain to the St. Louis River at Kingsbury Bay and ultimately to Lake Superior. Tributary 1 flows directly into the St. Louis River while Tributary 4 flows into Kingsbury Creek before meeting the St. Louis River. There will be no change in land cover due to the Project nor a change in surface hydrology. The quality and quantity of stormwater of pre- and post-project runoff will be the same, though the sediment load reaching Kingsbury Bay will be reduced.

Total disturbance will be about three acres. Erosion will significantly drop in the long term but there is higher risk in the short term if a high rainfall event occurs during construction or before the site revegetates. An NPDES/SDS Construction Stormwater General Permit and associated Stormwater Pollution Prevention Plan (SWPPP) will be required from the MPCA, which will address erosion and sedimentation during and after project construction. The Project will follow the permit conditions that are written. The Project will also adhere to guidelines associated with the City of Duluth Erosion Control permit. Both the MPCA and City of Duluth permits will likely include best management practices (BMPs) for perimeter sediment control including vegetated buffers, silt fence, and wattles (bundles or 'logs' filled with natural material that are laid horizontally along the ground to slow water and capture sediment), and erosion control practices such as minimizing the area of disturbance, rapid re-vegetation, mulching, erosion blankets, and/or hydromulch.

The Project would lower the risks from future increases in precipitation and storm intensity by

stabilizing channels and streambanks, providing floodplain access, addressing stormwater, and replacing or removing damaged infrastructure.

iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe anywell abandonment. If connecting to an existing municipal water supply, identify the wells tobe used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should theappropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.

The Project will not appropriate any water for construction or operation. It is not anticipated that the Project will require a DNR Water Appropriations Permit. The streams may be temporarily dewatered, and the streamflow diverted around the active construction area (either via a temporary channel or by pumping and discharging) before being returned to the stream. This would limit impacts to water quality at the Project site and areas downstream during construction.

iv. Surface Waters

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

Barr completed a wetland delineation survey in August of 2021. Eight wetlands, totaling 0.76 acres, were delineated in the Tributary 1 sites, all consisting of a wet meadow, Type 2, PEM1A wetland community. Seven wetlands, totaling 0.30 acres, were delineated in Tributary 4 sites. Two wetlands (0.21 acres) were wet meadow, Type 2, PEM1B wetland communities. Three wetlands (0.07 acres) were wet meadow, Type 1, PEM1A wetland communities. One wetland

(0.01 acres) was an alder thicket, Type 6, R4SB3 wetland community. The last Tributary 4 wetland (0.01 acres) was a small seasonally flooded basin, Type 1, PEM1C wetland community.

The total wetland acreage within the Project areas is 1.06 acres, however some of the wetlands are outside of the areas of disturbance. Disturbed wetlands will be less than one acre and is estimated at 0.78 acres. Potential impacts include excavation, leveling, tree removal, rutting by heavy machinery, and seeding/planting or other erosion control measures.

A Joint Application Form for Activities Affecting Water Resources in Minnesota will be submitted to the USACE and the MNDOT for review and approval. Any development impacting wetlands requires the formal approval by the designated city wetland representative. City ordinances require the applicant to submit a complete wetland delineation performed by a professional wetland delineator. Avoidance, minimization and mitigation protocol for wetlands is generally determined during the permitting process under consultation with the local Technical Evaluation Panel (TEP), which includes representatives of the US Army Corps of Engineers, DNR, Board of Water and Soils Resources, St. Louis County Soil and Water Conservation District, City of Duluth, among possibly others.

The wetlands are not identified as public water wetlands and are not situated below the ordinary high water (bankfull level) (OHWL) of the creek channels. Therefore, Wetland Conservation Act rules apply. According to *Minnesota Rules*, part 8420.0415, subpart D, and possibly other subparts related to restoration, the proposer will seek a "No Net Loss Determination" from wetland authorities based on the restoration objectives of the Project, including erosion control, bank stabilization, aquatic habitat improvement, and establishing a hydraulic connection between the channel and floodplain. Although existing wetlands will be impacted by construction related activity, their wetland features will generally be enhanced by increasing the frequency and duration of overbank flooding and reducing the amount of sedimentation affecting those areas. In the riparian wetland areas that are disturbed, native vegetation will be seeded or planted, and areas will be mulched with straw or covered with erosion control blankets.

No wetlands will be converted to upland and any impacted wetlands will be restored so there will not be any lasting impacts to the host watershed. The DNR also anticipates wetland creation in areas adjacent to the stream by increasing the frequency and duration of overbank flooding. The Project is not expected to have any effect on future wetland impacts due to climate change. One alternative that will be explored is the location of the access path at site 4B as there are wetlands present that may be avoidable. Other alternatives may be proposed during the permitting process by the TEP. No mitigation actions are proposed or expected.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicialditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid, minimize, or mitigate environmental

effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The major goals of the Project are to reduce erosion and stabilize the channel bed and banks. Project construction will have temporary physical impacts on the stream channels and riparian areas, but the long-term results will overall be positive as there will be less erosion and sedimentation. Vegetation clearing will be needed to clear access routes to the stream and along the stream corridor; width of disturbance along the stream ranges from 10 to 30 feet. Heavy equipment will reshape the channels by grading back streambanks and excavating channel materials. All material will be reused, but in some locations rock riffle material will be brought in from off site to remake the channel bed and banks. Boulders from off site will be used to create cross vanes and j-hook grade control structures that will help define and stabilize the new channel. The new channels will either be raised to connect to an existing floodplain, or a new floodplain will be carved at the streams existing elevation. As areas are finished, crews will cover disturbed areas with erosion control blankets, native plant seed mixes, and shrub plantings.

The Project will be constructed to minimize erosion to the greatest extent possible. Construction timing is planned for low flow conditions in summer or fall. The stream flow may be routed or pumped around the active construction site, if needed. Locations will be determined by the contractor and would likely be less than 100 feet long and would be utilized for short time periods of construction and would be routed within disturbed areas along the streams. Construction will halt during significant rain events and exposed soils covered. Disturbed areas will be kept to a minimum. Erosion control measures will include seeding and mulching all exposed soils, stabilizing soils, installing erosion control blankets, re-vegetating exposed soils, and maintaining erosion control measures until re-vegetation is complete. Generally, exposed banks will be seeded or planted with native vegetation and/or covered with biodegradable erosion control blanket that will be staked in place. The plantings will minimize long-term erosion of stream banks.

Construction activities have the potential to temporarily add turbidity to areas downstream, but erosion will be significantly reduced from pre-project levels once the site is revegetated. The streams will be more resilient to future impacts from increased floods due to more intense storms, by reconnecting the streams with their floodplains and installing grade control structures.

Neither stream is large enough for watercraft.

13. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions - Describe existing contamination or potential environmental hazardson or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or

exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

No evidence of contamination has been identified in the Project area. The MPCA's *What's In My Neighborhood* database indicates that there are not any contaminated sites within the Project sites. However, there are several locations along the Highway 23 corridor within 500 feet of sites 1D and 1E with active and inactive underground storage tanks as well one active site that produces small amounts of hazardous waste (<100lbs per year).

The database also shows there have been at least four confirmed petroleum product leaks at these sites over the past 50 years mainly due to faulty underground tanks. The investigations and associated cleanup have been completed, but two leaks (1992 and 2010) within 200 feet of Tributary 1 reported possible groundwater contamination. The extent and dispersal of the groundwater contamination is unknown. There is also an active investigation into a separate gasoline leak reported in June of 2021 located within 100 feet of the culvert that passes Tributary 1 under Highway 23, several businesses, and the BNSF rail line. A detailed report from the MPCA was completed in April 2022. Petroleum volatile organic compounds, gasoline range organics, and diesel range organics were found within soil samples taken from the investigation site. The report states that groundwater contamination is not expected since the depth of soil impacts (15 feet) and the depth of groundwater (60 feet) are at least 45 feet apart and separated by clay.

The Project does not anticipate significant work in or impacts to groundwater, which will reduce potential adverse effects from the leaks described above at sites 1D and 1E. Despite this, excavation of soils could expose some hidden contamination at any Project site. When unknown materials are encountered (i.e., buried containers, unknown seepage, oils, etc.), the proposer will evaluate the risk of contamination and remove the materials under guidance from local or MPCA hazardous material authorities.

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

We do not expect any significant solid wastes to be generated by the Project, though there will be small amounts of construction related wastes, such as plastic and paper containers and packaging. Any waste produced will be removed from the Project site either at the end of each workday or during final clean-up and properly disposed of.

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size

and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverseeffects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Excavation of soils could expose some hidden contamination. When unknown materials are encountered, i.e. buried containers, unknown seepage, oils, etc., the proposer will evaluate the risk of contamination and remove the materials under guidance from local or MPCA hazardous material authorities.

During the construction phases of the Project, fuels, oils, lubricants, and other materials typical for use by earthmoving equipment. An accidental release or spill of any of these substances could occur and could result in potentially adverse effects to on-site soils. However, the amounts of fuel and other lubricants and oils will be limited, and the equipment needed to quickly contain any contamination will be located on site. No other chemicals or hazardous materials are needed for or will be generated by the Project.

The Contractor will be required to prepare a Spill Prevention and Response Plan to address accidental spills or the release of any hazardous material or petroleum products. The plan will be required to include the following measures to avoid and/or minimize spills during construction activities:

- Fueling and equipment maintenance will not be allowed within 100 feet of the water's edge without deploying spill capture methods.
- The contractor shall maintain fuel spill containment kits and trained spill response personnel on site at all times.
- Any spill or release of a hazardous material or petroleum products will be reported to the construction site supervisor who will take immediate action to minimize the potential for groundwater or surface water pollution.
- In the event of a significant spill or release of a hazardous material or a petroleum product, the construction site supervisor will immediately deploy on-site equipment and supplies to contain the spill and contact the DNR, MPCA and the Minnesota Duty Officer, according to emergency procedures identified in Minnesota Rules, part 7045.0574.
- Temporary, above ground, on-site fuel storage will not be allowed within the 100-year floodplain.
- Below ground storage tanks will not be allowed.

To minimize any potential for spills, fuels for construction will be stored at staging areas away from the stream and pervious surfaces. Equipment refueling and maintenance will be done away from the stream and pervious surfaces, thus reducing the risk of potential contamination.

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

The Project will not generate or store hazardous wastes during construction.

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

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

Fish

Fish habitat is very limited in Tributary 1 due to its small drainage area and very low flows for most of the year. Adjacent landowners have reported seeing it run dry during summer months. No fish surveys are available for the stream, and it is unlikely there are significant fish populations utilizing the stream.

Tributary 4 also has a small drainage area but has more flow and available aquatic habitat. It is documented to have water cold enough for trout habitat and trout have been observed in the stream, however no fish surveys are available. A 2017 survey in the Kingsbury Creek mainstem found adult brown trout just downstream of the mouth of Tributary 4. Blacknose Dace and White Sucker were noted as present and Creek Chub were abundant. A 1995 survey found Blacknose Dace, Brook Stickleback, Brown Trout, Central Mudminnow, Creek Chub, Johnny Darter, Logperch, Longnose Dace, Pearl Dace, Shiner, Smallmouth Bass, and White Sucker along the Kingsbury mainstem. These species are also likely to inhabit reaches of Tributary 4.

Wildlife

Potential wildlife communities are similar at both streams. Resident wildlife species include white-tailed deer, black bears, furbearers (coyotes, bobcats, raccoon, and mink), cottontail rabbits and a variety of small mammals (mice, voles, shrews). A wide variety of bird species frequent the area including raptors (bald eagles, hawks, and owls), waterfowl (wood ducks, mallards, and Canada geese), waterbirds (kingfishers, great blue herons) and songbirds. Reptiles and amphibians also frequent the area.

Vegetation

The Project is located within the Split Rock Till Plain Land Type Association, a part of the North Shore Highlands subsection and Northern Superior Uplands Section of the Ecological Classification System of Minnesota. Historically, the forest type in the area was comprised of white and Norway pine, cedar, aspen, and birch. Today, the project areas are dominated by deciduous forest tree species including aspen, birch, maple, basswood, and oak.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, andother sensitive ecological resources on or within close proximity to the site. Provide the license agreement number ( ) and/or correspondence number (ERDB 20220100) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The Natural Heritage Information System (NHIS) concurrence letter (Attachment 3) identified one

18. Greenhouse Gas (GHG) Emissions/Carbon Footprint

a. GHG Quantification: For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to cometo that conclusion and any GHG emission sources not included in the total calculation.

Greenhouse gas emissions related to the Project include those related to the construction of the Project. No operational GHG emissions are anticipated, as there is no permanent infrastructure or ongoing operations. Construction is slated to begin in summer 2022 and finish before the end of 2022. For this assessment construction GHG emissions included:

- On-road vehicle emissions: haul trucks
- Off-road vehicle emissions: earthmoving equipment (excavators, loaders, etc.)

On-road vehicle emissions include those generated by the haul trucks, which will bring needed equipment and supplies to the Project site. This operation will consist of 1 truck making two 40-mile trips per day for twelve weeks. The trucks are assumed to be in operation from 7:00 am to 7:00 pm. Carbon emissions related to the on-road vehicle emissions is estimated to be 8.2 short tons.

Table 9. Project on-road equipment use

On- road Equipment	Trucks/hr	Hrs/day	Days	Miles	Est. miles	miles/gal	Est. gals
Diesel Haul Trucks	1	2	60	40	4,800	6	800

Table 10. Project emissions from 0n-road equipment.

Emission Factors[1]			Emissions[2]			
CO_2 kg/gal	CH_4 g/mile	N_2O g/mile	CO_2 Short tons	CH_4 Short tons	N_2O Short tons	CO_2e Short tons
10.21	0.0095	0.0431	8.168	0.001	0.062	8.231

[1] Center for Corporate Climate Leadership (updated March 26, 2020) provided emission factors for greenhouse gas inventories (Tables 2, and 4) and global warming potential (GWP)
(GWP for CH_4 = 25; GWP for N_2O = 298)

[2] CO_2e emissions calculated using the following equations per the EQB Revised EAW Guidance:

- tons CO2 = fuel use in physical units *CO2 Emission Factor (kg CO2/physical unit of fuel use) * Conversion of kg to tons
- tons CO2e = Vehicle Miles Traveled * N2O Emission Factor (g/mile) * Conversion of g to tons * GWP
- tons CO2e = Vehicle Miles Traveled * CH4 Emission Factor (g/mile) * Conversion of g to tons * GWP

Off-road vehicle emissions include those generated by construction equipment that will remain on the Project site for the duration of construction. This includes earthmoving equipment such as excavators and loaders. There are potential differences in the specific equipment utilized based on the contractor selected to complete the work. For the purposes of this assessment, we assumed that two diesel-powered off-road construction vehicles would be in operation during the construction period, though one operating at only half the daily hours.

The off-road vehicle emissions will be in operation for the duration of the construction of the Project. For the purposes of this assessment, we assumed construction would be ongoing for twelve weeks. Under this assumption, total days of construction would amount 60 days. The number of construction days may be less than the assumed amount if inclement weather or other circumstances arise. However, we opted to use the maximum allowable for this GHG assessment to consider the maximum emissions generated from the proposed Project. Construction is assumed to be ongoing from 7:00 am to 7:00 pm during this time, however this may vary seasonally (i.e., longer days in the summer months, shorter days in the winter months).

According to our assessment, carbon emissions related to construction vehicles emissions is estimated to be 111.835 short tons.

Table 11. Project emissions from off-road equipment.

Off-road Equipment	No./day	Hours/day	Total Days	Gallons/hour	Estimated gallons
Diesel Construction Equipment	1.5	12	60	10	10,800

Table 12. Project emissions from off-road equipment.

Emission Factors[1]			**Emissions[2]**			
CO_2 kg/gal	**CH_4** g/gal	**N_2O** g/gal	**CO_2** Short tons	**CH_4** Short tons	**N_2O** Short tons	**CO_2e** Short tons
10.21	0.2	0.047	110.268	0.054	1.513	111.835

[1] Center for Corporate Climate Leadership (updated March 26, 2020) provided emission factors for greenhouse gas inventories (Tables 2, and 4) and global warming potential (GWP)
(GWP for CH_4 = 25; GWP for N_2O = 298)

[2] CO_2e emissions calculated using the following equations per the EQB Revised EAW Guidance:

- tons CO2 = fuel use in physical units *CO2 Emission Factor (kg CO2/physical unit of fuel use) * Conversion of kg to tons
- tons CO2e = Vehicle Miles Traveled * N2O Emission Factor (g/mile) * Conversion of g to tons * GWP
- tons CO2e = Vehicle Miles Traveled * CH4 Emission Factor (g/mile) * Conversion of g to tons * GWP

b. GHG Assessment
   i. Describe any mitigation considered to reduce the project's GHG emissions.
   ii. Describe and quantify reductions from selected mitigation, if proposed to reduce theproject's GHG emissions. Explain why the selected mitigation was preferred.
   iii. Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.

No mitigation to reduce the Project's GHG emissions is proposed. Construction-related emissions will be exempt as *de minimus* and they will meet the conformity requirements under Section 176 (c) of the Clean Air Act, and 40 CFR 93.153. Predicted GHG emissions related to the Project are limited to those generated during construction. There will not be any operational GHG emissions. The Project sponsor will encourage the selected contractor to reduce GHG emissions from construction, which may include minimizing idling equipment or encouraging carpooling to the site by equipment operators.

19. Noise

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

Minnesota Rules, part 7030.0040 establishes two noise levels, L_{10} and L_{50}, based on the percent of time noise levels exceed the standard over a one-hour time period: L_{10} is defined as "noise levels exceeding the standard for ten percent of the time for one hour (6 minutes/hour)" and L_{50} 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 while NAC 3 includes highways and rail lines.

Noise standards established for NAC Level 1 areas are as follows: daytime standards (7:00 am to 10:00 pm) for the respective L levels are 65 decibels (dBA) (L_{10}) and 60 dBA (L_{50}); and nighttime standards (10:00 pm to 7:00 am) are 55 dBA (L_{10}) and 50 dBA (L_{50}). According to the Federal Highway Administration, the average noise level at 50 feet from an excavator is 81 dBA (FWHA Construction Noise Handbook, Table 9.1). Sound decreases from a point source at a rate of six dBA for every doubling of distance from the source (MPCA Guide to Noise Control in Minnesota). The table below provides an estimated noise level as a function of distance, based on information from the FHWA handbook and the MPCA guide.

Table 11. Expected noise level at different distances from construction equipment.

Distance from Source (Feet)	Noise Level (dBA)	Notes/Reference
50	81	Average referenced for excavator/generator in Table 9.1, FHWA handbook
100	75	Calculated based on the MPCA guide
200	69	Calculated based on the MPCA guide
400	62	Calculated based on the MPCA guide
800	56	Calculated based on the MPCA guide

Construction work at Tributary 4 will range from 400 feet to 1,200 feet from the nearest sensitive receptors, which are the residences to the northwest of the project area. However, the staging area (where equipment will be less active) for one of the sites is within 200 feet of the residences. The stream is in a deep valley at the upper sites, so the travel of noise will be minimized by the surrounding ridges. The Tributary 1 sites have residential residences within 100 feet of the project sites. The DNR will contact these residents to inform them of the Project and provide them a description of work hours. No work is anticipated between the hours of 7:00 PM and 7:00 AM.

The contractor will be required to minimize noise effects by:

- Restrict equipment operation only during daylight hours (6am – 7 pm), Monday-Saturday.
- Require all equipment to have properly operating muffler systems.
- Restrict idling time for inactive equipment to 15 minutes.
- Notify adjacent landowners and businesses about the intent of the Project, duration, expected noise levels and complaint procedures.

All sites have rail lines and highways within a half mile. The DWP trail (NAC 2) is also adjacent to sites 1A and 1B for about 400 feet. Signs will be placed along the trail outside the construction zone to alert trail users of the construction activity. Construction crews will only be present at each site for a few weeks so all noise impacts will be temporary in nature.

Project construction will temporarily generate noise above current use for residents and trails users. Construction will use equipment classified as "mobile equipment" including dozers, cranes, graders, excavators, etc. Typical sounds will include engine noise, sounds of metal on rock, and safety back-up alarms. The residences and trail users adjacent to the Tributary 1 work sites will be exposed to construction related noises. Hours of operation will mitigate this to some extent. Once complete, the Project will not generate noise.

20. Transportation

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

1) The Project will not create additional parking spaces. During construction, crews will park vehicles at proposed staging areas, away from the public highways. 2) Movement of crews, the acquisition of construction materials, and refueling will likely generate a temporary traffic increase in the vicinity. The number of vehicles entering and leaving the Project area throughout each day is expected to be about 15 vehicles. 3) Off-site vehicle movements will occur during the start and end of the work schedules but could occur at any time during the hours of equipment operation from 7:00 AM to 7:00 PM. 4) Normally less than 20 daily trips are anticipated. 5) Alternative bus transportation is available along Grand Avenue and to the Zenith Terrace community which is within half a mile from all project sites, providing a viable option for crews working on all sites.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvementsnecessary. The analysis must discuss the project's impact on the regional transportation system.*If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance,

No Project related congestion is expected, and the Project will not generate an additional 250 vehicles or 2,500 trips per day on affected roads. During construction, about 15 vehicles will access the worksite. This includes workers personal vehicles, heavy equipment and fuel delivery, and dump trucks hauling material.

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

Access routes from public roads will be evaluated for safety and operators of equipment turning onto and off public highways will use caution. Safe driving expectations will be covered with contractors during initial site visits and project briefings. No other additional measures will be needed to mitigate Project-related transportation impacts.

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

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

The Project area is 11.07 acres and will address 2,620 linear feet of stream. However, only 2.63 acres will be physically disturbed during construction activities. The stream channel, eroding streambanks, and adjacent floodplains will be reshaped as specified in the plans and grade control features, vegetated reinforced soil slopes, and rock riffles will be installed along seven project sites. Two sites are on Tributary 4 and five sites are on Tributary 1.

Potential environmental effects of construction in the Project areas include water quality/stormwater pollution, temporary wetland impacts, visual, dust, noise, and traffic impacts over roughly three months during the summer and fall of 2022. Effects to wildlife, fisheries, rare features, hazardous and solid waste generation, and air emissions are expected to be negligible. A habitat assessment for the state-endangered pale sedge will be conducted to determine if habitat is present and if project impacts to this plant may occur. The area of potential effect (APE) for wetlands, visual, dust, noise, and traffic is an approximate 1,000 foot zone surrounding the 11.07 acres of construction sites. The APE of temporary water quality/stormwater pollution includes the mid- and lower elevations of Kingsbury Creek, 68th Avenue West Creek, Kingsbury Bay, and areas downstream in the St. Louis River estuary. Following construction, the Project will have ongoing beneficial effects to aquatic habitat and water quality in these streams and Kingsbury Bay.

<u>Wetlands and Water Quality:</u>
Disturbed wetlands is estimated at 0.78 acres. Potential impacts include excavation, leveling, tree removal, rutting by heavy machinery, and seeding/planting or other erosion control measures. No wetlands will be converted to upland and any impacted wetlands will be restored so there will not be any lasting impacts to the host watershed. The Proposer also anticipates wetland creation in areas adjacent to the stream by increasing the frequency and duration of overbank flooding.

The major goals of the Project are to reduce erosion and stabilize the channel bed and banks. Project construction will have temporary physical impacts on the stream channels and riparian areas. Construction activities have the potential to temporarily add turbidity to areas downstream, but erosion will be significantly reduced from pre-project levels once the site is revegetated. Best management practices will be utilized to minimize erosion and sedimentation during project construction; examples include vegetated buffers, silt fence, and wattles, and erosion control practices such as minimizing the area of disturbance, rapid re-vegetation, mulching, and erosion blankets.

Visual:
During construction, equipment may be visible from roads and trails. Any negative visual impacts from equipment or the disturbed landscape will be short term in nature and aesthetics of the sites will be improved once construction is complete and the disturbed areas revegetated.

Dust:
The Project may create some temporary dust during construction activities. Fugitive dust could arise during hauling and stockpiling of earthen materials and large tree branches and trunks. Construction will involve the movement and grading of soils and rock materials in dry or moist soil condition. Most materials handled are stone and wood and do not cause fugitive dust generation. Effects associated with fugitive dust and offensive odors will be limited to the construction site and immediately adjacent areas. The contractor will be required to follow best management practices to reduce dust which are described in Item 17c.

Noise:
During construction, noise levels will temporarily increase and exceed NAC noise levels due to construction equipment engine noise, sounds of metal on rock, and safety back-up alarms. Hours of operation will mitigate this to some extent. Once complete, the Project will not generate noise.

Traffic:
The Project will require trucks to haul 590 cubic yards of material to the sites in addition to the daily movements of works and equipment. The additional traffic of about 15 vehicles per day over the course of the project is not expected to create traffic congestion near the project sites.

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

The 2019 Feasibility Report identified fourteen projects within the Kingsbury Creek and 68th Avenue West Creek watersheds. This Project only addresses eight of them, with the remaining all located in the Kingsbury Creek watershed. They are similar in scope in that they would address erosion and unstable channels to reduce sediment supply and improve aquatic habitat. Some may also address channel pattern and re-meander the stream channel. While there are multiple entities that have an interest in seeing these projects completed, no planning has started, nor funding secured. Any construction is at least two years out. Since planning has not begun and

funding has not been secured for these additional 14 projects, these projects do not meet the definition of a reasonably foreseeable future project (for which a basis of expectation has been laid), and is therefore not included in the discussion in part C below.

The DNR contacted the South Saint Louis Soil and Water Conservation District, the City of Duluth, MNDOT, and Saint Louis County and identified the four projects below.

A MNDOT project is underway at the Thompson Hill Visitor Center to regrade and resurface parking areas, improve lighting, replace sidewalks, increase accessibility, and install railings. Work should be completed in the spring of 2022, before the proposed Project will begin, creating a new "existing condition." This project is not included in the discussion in part C below since it would not occur within the same timeframe of the proposed Project.

The Zenith Terrace community is planning to replace a culvert on Tributary 4 upstream of the Project. The timeline is unknown. Since the timeline of this project is unknown, this project does not meet the definition of a reasonably foreseeable future project (for which a basis of expectation has been laid), and is therefore not included in the discussion in part C below.

The owners of parcel #010-2741-01076 to the east of site 4A are in the process of developing the parcel for a low-density residential housing subdivision. Detailed project plans have not been obtained. However, construction will include about 3,000 feet of roadway and a stormwater basin along with 13 residential lots. Each lot would be about five acres and include septic and wells. The full construction timeline is unknown, however, work on the roadway started this spring.

A second residential development with about 16 homes is proposed on 2.5 acres located approximately 600 feet east of site 1B. This development will include about 16 homes which will be connected to city water and sewer. Information on project timeframes and detailed plans have not been obtained. Since the timeline of this project is unknown, this project does not meet the definition of a reasonably foreseeable future project (for which a basis of expectation has been laid) and is therefore not included in the discussion in part C below.

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

Construction of the residential development east of site 4A discussed above is likely to create similar temporary impacts to visual, dust, noise, and traffic as described in Item 21A above. Significant cumulative effects are not expected from the temporary increases in these items.

It is unknown if the residential development site contains wetlands, and if so, if impacts to wetlands would occur. The residential project would be subject to state and federal wetland laws, and any permanent impacts to wetlands would need to be mitigated for per the Rules of the Minnesota Wetland Conservation Act. The overall goal of the Wetland Conservation Act is no net loss of wetlands. As such, if wetland impacts did result from the residential developments, these impacts in combination with temporary wetland impacts from the proposed Project would not be expected to result in significant cumulative wetland impacts to the watershed.

Detailed grading and construction plans were not obtained to be able to describe any water quality/stormwater pollution impacts the construction of the residential development might have in the vicinity of the proposed Project, though any impacts from construction would be expected to be temporary. The majority of the residential development site does not drain to the Kingsbury Creek (Tributary 4), but rather drains to the 62nd Avenue West Creek, which is in a neighboring watershed. A small portion of the property currently drains to Kingsbury Creek and will continue to do so once the site is developed. A portion of two residential lots falls within this area and will drain to Kingsbury Creek. It is possible that water quality/stormwater pollution impacts to Kingsbury Creek could occur during construction of the two homes within the Kingsbury watershed. It would be expected that these impacts would be temporary and could be mitigated through mitigation measures such as instilling silt fences and proper grading. The 3,000-foot roadway will drain to the 62nd Avenue West Creek. Any water quality/stormwater pollution impacts from constructing the roadway and the remaining homes would not likely effect Kingsbury Creek or the Kingsbury Creek and 68th Avenue West watersheds. However, the watershed of both projects (the proposed Project and the residential development) drain to the St. Louis River estuary and could result in water quality/stormwater pollution impacts within the estuary. Significant negative effects to water quality from both projects is not expected to the St. Louis River and would be expected to be temporary and could be mitigated through installing silt fences and grading measures.

The goal of the proposed Project is to provide a net benefit to the Kingsbury Creek and 68th Avenue West watersheds and areas downstream by reducing erosion and sediment loads, improving aquatic habitat, stabilizing stream channels, and connecting streams to their floodplain. Another goal of the proposed Project is to increase the resiliency of the recently completed Kingsbury Bay – Grassy Point project that removed large sediment deposits from Kingsbury Bay and restored open water and wetland habitat. It is not expected that the proposed Project and the residential development will result in significant cumulative environmental effects within the area.

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

There are no other expected environmental effects.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** EnvironmentalAssessment 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 myknowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60,respectively.

September 2021 version; Contains greenhouse gas quantification and assessment as well as adaptation and resiliency information

- Copies of this EAW are being sent to the entire EQB distribution list.

Signature: /s/ Becky Horton Date: May 10, 2022

Title: EAW Project Manager

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