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 form provides information about a project that may have the potential for significant environmental effects. 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 be addressed 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 an EIS.

1. **Project title:** Skandia Wildlife Management Area Stream and Wetland Restoration Project

2. **Proposer:** MN Department of Natural Resources

3. **RGU**: MN Department of Natural Resources

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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):

Minnesota Rules 4410.4300, Subpart 27. Public waters, public waters wetlands, and wetlands.

5. Project Location:

- County: Murray County
- City/Township: Lake Sarah Township
- PLS Location (¼, ¼, Section, Township, Range):

¼	¼	Section	Township	Range
NE	NW	12	108N	42W

- Watershed (81 major watershed scale): Des Moines Headwaters (37)
- GPS Coordinates: 44.138165, -95.815962
- Tax Parcel Number 11-030-0020, 11-019-0040

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

- County map showing the general location of the project; See **Figure 1.** Location Map
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
  See **Figure 2.** USGS Map Exhibit and **Figure 3** Stream Length and LOD Exhibit
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.
  See Attachment D 95% Design Drawings.
- 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 during the life of the project (as detailed below in item 7. Climate Adaptation and Resilience).

Figures
Figure 1: Location Map
Figure 2: USGS Map Exhibit
Figure 3: Stream Length and LOD Exhibit
Figure 4: Seeding and Restoration Plan
Figure 5: Wetland Delineation Figure

Attachments
Attachment 1: Natural Heritage Review
Attachment 2: Design Documentation Report
Attachment 3: 95% Design Drawings
Attachment 4: Information for planning and consulting (IPAC)

6. Project Description:

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

Minnesota DNR proposes to restore a channelized stream and create and restore wetland habitat within the Skandia Wildlife Management Area (WMA). The channel within this segment of the WMA was historically straightened (channelized) to accommodate agricultural activities. The proposed project will restore stream sinuosity via re-meandering to improve water quality, habitat, and floodplain connectivity.

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

Proposed Project Description:
The project proposes converting a channelized section of stream to add approximately 1,200 feet of Unnamed Stream and reconnecting the adjacent floodplain while protecting Skandia WMA Fen-a and Skandia WMA Fen-b, high quality calcareous fens located upstream of the project area. Wetland scrapes to create and restore wetland habitat within the floodplain are proposed to help with flood storage and water quality treatment. The project area is fully within Skandia WMA and is intersected by 201st Street.

Project Background:
This project is part of a larger Skandia WMA Stream and Wetland Restoration Project. The unnamed stream had been previously straightened to support agriculture in the area. The project will re-meander the stream. The re-meandered stream will raise the water table, increase watershed capacity, and prevent upstream calcareous fens from draining.

Construction Methods:
The stream restoration is anticipated to include the following major elements:

- Channel plugs – Channel plugs will be installed where erosion risk is the highest in the new channel. The plugs will be filled in with excavated materials from the new channel and will be made of materials that are denser than surrounding fill. The culvert will be 52 feet long and will contain 1 foot of channel overbury. The overbury material will be Class III and will be consistent with the surrounding restoration area.
- Channel excavation
- Site grading

- Culvert Replacement – A 6-foot by 5-foot box culvert will be installed in the new channel.
- Road crossing modifications
- Streambank stabilization
- Erosion and sediment control
- Vegetation restoration (Figure 4)

Construction will be phased to minimize impacts to the stream. The construction sequencing/staging will take place as follows:

1. Establish vehicle tracking pads such as rock construction entrances.
2. Install perimeter controls, such as silt fence, at downgradient perimeters of site.
3. Create stabilized staging areas and preserve vegetative buffer at site perimeters.
4. Create temporary crossings of the waterbody areas with timber matting or equivalent to avoid rutting.
5. Construct new channel and scrapes as shown in plans.
6. Install new culvert and repair roadway.
7. Remove existing culvert and repair roadway.
8. Divert flow into new channel and fill in existing ditch.
9. Place excess material in locations shown in plans.
10. Provide temporary stabilization of disturbed soils that will remain idle for a period of 14 days or more.
11. Perform final stabilization of all disturbed soils.
12. Remove all temporary sediment control devices once the site has achieved final stabilization.

Proper erosion and sediment control methods will be implemented throughout the project area to prevent sediment from entering the stream. Construction of the channel is recommended to take place from downstream to upstream to limit the amount of water in the new channel during construction. Channel filling will not take place until vegetation is established enough to prevent sediment and additional erosion. Excess excavated materials will be seeded and stabilized. Following final stabilization all temporary erosion and sediment controls will be removed.

Natural Resource Impacts:
The Project area is located on the Skandia WMA. The surrounding landscape is mainly agricultural lands with occasional roads. Construction activities would impact portions of the unnamed stream and immediate vicinity through the grading, culvert installation, and diversion. The diversion of the unnamed tributary to the new channel would permanently impact existing aquatic organisms as channel flow would be changed. Prior to construction, fish and other species of interest within the existing channel would be relocated downstream of the project. Impacts to aquatic resources and the stream are subject to federal and state regulations. The Project is seeking permitting through federal and state organizations as listed in section 9.

Timing and Duration:

- Field Assessments: Spring 2025
- Final Plans and Design Documentation: Winter 2025/2026
- Proposed Project EAW: Spring 2026 – Fall 2026
- USACE, WCA, and DNR Public Waters Permits: Apply Fall 2026
- Desired Construction Start: Construction Winter 2026-2027
- Estimated Construction Completion: June 2027

c. Project magnitude:

Description	Number
Total Project Acreage	28.5 Acres
Linear project length	3,193 ft (proposed stream restoration)
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 the need for the project and identify its beneficiaries.

The project's purpose is to improve stream health, water quality and floodplain connectivity, and habitat within the Skandia WMA. The project improves aquatic organism passage and habitat through stream restoration and shallow wetland scrapes to create additional wetland habitat within the WMA property. The beneficiaries of the project are predominantly hunters and those that visit the WMA. The project is expected to have minor benefits to downstream water resources including Lake Maria.

e. Are future stages of this development including development on any other property planned or likely to happen? No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

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

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 during the life of the project.

Skandia WMA is located in Murray County, MN, approximately 2 miles from the unincorporated community of The Lakes. The project area is set aside to be managed as a WMA for the foreseeable future, so long-term climate projections are appropriate for assessing potential effects to the project area.

Between 1980 - 2024, the average annual temperature in Murray County was 44.4 °F. Since 1980, average annual temperature in Murray County has increased by 1.3 °F. In comparison, the statewide average increased by 1.8 °F during the same time period.[1] Most of this warming is concentrated during the coldest months of the year, with average winter temperatures increasing by 3.1°F and average winter low temperatures increasing by 4.9 °F.[2] Between 1980 - 2024, the average annual precipitation in Murray County was 28.6 inches. Since 1980, average annual precipitation in Murray County has increased by 2.4 inches. In comparison, the statewide average increased by 1.6 inches during the same time.

Table 7-1 presents predicted changes in annual climatic conditions in Murray County, MN based on emissions scenarios and time scale, per the Minnesota CliMAT model. On average, annual daily average temperature in Murray County is projected to increase 6.5 to 11.0 °F by the end of the century, relative to historical simulations (1995-2014)[3]. On average, the annual number of days that exceed 95 °F in Murray County is projected to increase between 12.2 and 46.5 days by the end of the century, relative to historical simulations (1995-2014). On average, the annual number of days that minimum temperature drops below 32 °F in Murray County is projected to decrease between 20.3 and 60.1 days by the end of the century, relative to historical simulations (1995-2014).

Predicted changes in average annual precipitation in Murray County seem less certain, with CliMAT models predicting between -1.49 inches and 3.60 inches difference relative to historical simulations (1995-2014). However, the timing and intensity of precipitation in Southwest Minnesota is expected to shift, with wetter springs, drier summers, shorter snow seasons, heavier rain events, and longer dry spells without measurable rainfall.[4] The community of The Lakes, specifically, has minor risk from flooding over the next 30 years with commercial properties at the greatest risk. 325 properties, representing 23.2% of all properties in The Lakes, are at risk of flooding in the next 30 years.[5] The frequency of drought periods is increasing; between 1980 and 2025, the Palmer Drought Severity Index increased by about 0.59 per decade.

[1] https://climate.umn.edu/MN-CliMAT
[2] https://climate.umn.edu/climate-change-southwest-minnesota
[3] https://climate.umn.edu/MN-CliMAT
[4] https://climate.umn.edu/climate-change-southwest-minnesota
[5] https://firststreet.org/city/the-lakes-mn/2764543_fsid/flood

Table 7-1. Average annual difference in climate conditions in Murray County, MN, relative to historical simulations (1995-2014), per the Minnesota CliMAT model.

Scenario	Time Period	Precipitation (inches)	Daily Average Temperature (°F)	Days with Maximum Temperature above 95 °F	Days with Minimum Temperature below 32 °F
Intermediate Emissions (SSP 245)	Mid-century (2040-2059)	+1.35	+3.7	+12.2	-20.3
	Late-century (2060-2079)	+2.08	+4.9	+15.8	-26.4
	End-of-century (2080-2099)	-0.49	+6.5	+24.0	-35.1
High Emissions (SSP 370)	Mid-century (2040-2059)	-1.49	+4.6	+15.5	-22.6
	Late-century (2060-2079)	-0.81	+6.7	+25.0	-36.5
	End-of-century (2080-2099)	+0.79	+8.7	+37.2	-43.9
Very High Emissions (SSP 585)	Mid-century (2040-2059)	+0.81	+4.3	+16.8	-24.2
	Late-century (2060-2079)	+3.48	+6.8	+26.8	-39.9
	End-of-century (2080-2099)	+3.60	+11.0	+46.5	-60.1

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	Project Information	Adaptations
Project Design	Changing climate zones, increased average temperature trends, potential for extended heat waves and flood events.	The project will involve recontouring a riparian landscape resulting in short-term shallow disturbance to areas of existing vegetation within wetlands and floodplains.	Landscape recontouring will result in greater soil water retention and aquifer recharge potential within the project area and upstream critical habitat. Stream meandering and creation of shallow wetland depressions will result in improved stream bank stability and a richer variety of microhabitats allowing for a diversity of native flora and fauna to better endure extended drought and flood conditions.
Project Design	The production, transportation and disposal of construction materials result in GHG emissions.	The project involves the removal and disposal of a 36-inch round reinforced concrete pipe (RCP) culvert for the main channel flow and a secondary 42-inch round corrugated metal pipe (CMP), replacing them with 6-foot span and 5-foot rise concrete box culvert. Temporary stormwater sediment control devices will be used during construction and revegetation.	The upgraded culvert system will be designed to accommodate more intense storm and flood events, while providing contiguous streambed substrate for aquatic species. To the extent practicable, construction materials should be sourced and disposed of near the project site. Temporary soil stabilization and sediment control BMPs should prioritize non-toxic biodegradable materials to be left in place, reducing subsequent ground disturbance, material disposal, and equipment emissions.
Project Design	Operation of internal combustion engines consumes fossil-based fuel and results in GHG emissions.	Diesel-fueled construction vehicles, gasoline-fueled pumps, and gasoline-fueled personal vehicles may be used to conduct construction activities and transport project personnel.	To the extent practicable, the construction contractor should limit transportation of equipment and personnel to the site and use biogenic fuel options for equipment and vehicles (biodiesel, bioethanol, electric vehicles, etc.). To the extent practicable, pumps should be operated in a manner that allows for float activation, reducing operation to periods of high water flow and increasing water retention time upstream.
Project Design	The removal of wetlands and other low-lying areas eliminates the ability for the land to retain and absorb stormwater, leading to more intense stormwater runoff, nutrient loading, contamination, and habitat loss.	The project enhances current land use functions by increasing stormwater residence time, stabilizing stream banks, and contouring depressions for infiltration during periodic flood events.	Restoring a meandering stream course and contouring the surrounding riparian area to support periodic flooding will result in improved stormwater retention and infiltration, nutrient retention, and a variety of microhabitats for native flora and fauna.

Resource Category	Climate Considerations	Project Information	Adaptations
Water Resources	Climate change models predict more intense precipitation events, riverine flooding, localized flash flooding at streams, stormwater management facilities, and in upland areas lacking overflow and conveyance capacity.	The project proposes to increase stream and wetland surface area, establish native riparian habitat, and will not reduce tree cover.	Restoring natural systems that promote infiltration of rainfall where it falls, mimic predevelopment hydrology and provide additional ecosystem services.
Contamination/ Hazardous Materials/Wastes	Warmer, wetter weather with more frequent extreme rainfall events and localized flooding could increase erosion of exposed soil and other earthen materials and transport pathogens and environmental contaminants that are dangerous to people and livestock.	The project enhances settling of stream sediments by increasing stormwater residence time, stabilizing stream banks, and contouring depressions for infiltration during periodic flood events.	Restoring a meandering stream course and contouring the surrounding riparian area to support periodic flooding will result in improved stormwater retention and infiltration, nutrient retention, and less risk of downstream contaminant transport.
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	Significant changes in the timing of life-cycle events for a wide range of plant and animal species could result in the unavailability of essential food resources during critical life-history stages.	The project restores a more natural stream course and creates additional microhabitats to support a wider variety of flora and fauna. Ground disturbance is limited and vegetation management will ensure establishment of native plants.	Prairie communities with higher biological diversity and connectivity are expected to have a greater capacity to respond to changes in precipitation, moisture, and temperature than are lowerdiversity, fragmented communities.a Where these prairie complexes exist, the increased biological diversity and connectivity may increase their ability to reorganize while still retaining prairie species, structure, and functions.

[a] Minnesota's Wildlife Action Plan 2015-2025. Access March 2026 at https://files.dnr.state.mn.us/assistance/nrplanning/bigpicture/mnwap/wildlife-action-plan-2015-2025.pdf

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

Cover Types	Before (acres)	After (acres)
Wetlands and shallow lakes (<2 meters deep)	0.00	3.28
Deep lakes (>2 meters deep)	0.00	0.00
Wooded/forest	0.00	0.00
Rivers/streams	0.88	2.58
Brush/Grassland	27.6	22.64
Cropland	0.00	0.00
Livestock rangeland/pastureland	0.00	0.00
Lawn/landscaping	0.00	0.00
Green infrastructure TOTAL (from table below*)	0.00	0.00
Impervious surface	0.00	0.00
Stormwater Pond (wet sedimentation basin)	0.00	0.00
Other (describe)		
TOTAL	28.5	28.5

Green Infrastructure	Before (acres)	After (acres)
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	3.28
Constructed green roofs	0	0
Constructed permeable pavements	0	0
Other (describe)	0	0
TOTAL	0	3.28

Trees	Percent	Number
Percent tree canopy removed or number of mature trees removed during development	0	0
Number of new trees planted	0	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 prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Unit of Government	Type of Application	Status
Lake Sarah Township	Grading Permit	In Process
Minnesota Pollution Control Agency	Stormwater Pollution Prevention Plan	In Process
Minnesota Department of Natural Resources	Public Waters Work Permit	In Process
United States Army Corps of Engineers	Section 404 Permit	In Process
Murray County SWCD	Wetland Conservation Act	In Process
Minnesota Pollution Control Agency	Section 401 Water Quality Certification	In Process
Minnesota Department of Natural Resources	Calcareous Fen No Effect Concurrence	In Process

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 parks and open space, cemeteries, trails, prime or unique farmlands.

The Project site is located within the Minnesota's Department of Natural Resources Skandia WMA and the adjacent land is a mix of primarily agricultural and mixed prairie landscapes. A review of the U.S. Geological Survey (USGS) 2023 National Land Cover Data indicates that the land coverage within the Project area is a mix of pasture/hay, cultivated crops, emergent herbaceous wetlands, and grassland/herbaceous [7]. The closest recreation area is approximately 2 miles northeast of the Project area and is associated with Lake Sarah.

Wildlife management areas: The Project site is located within Minnesota's Department of Natural Resources Skandia WMA. The DNR WMAs provide access to the outdoors and recreation for hunters and trappers throughout the State of Minnesota.

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

7 https://mnatlas.org/gis-tool/

or federal agency.

Department of Natural Resources' WMA. The state of Minnesota established WMAs in 1951 as a program to Save the Wetlands which has evolved to protect lands and waters that have a high potential for wildlife production and related recreational uses. The Project is located within the Skandia WMA. The Skandia WMA is approximately 498.8 acres and has an emergent marsh with irregular boundaries. The WMA is associated with deer, small game, pheasants, and waterfowl and is considered good wildlife wintering habitat[6]. The site's existing and planned land use is hunting ground – WMA and remains unchanged with the proposed project.

One Watershed One Plan: The Project area is under the Des Moines River Watershed Comprehensive Management Plan, implemented in 2023[9]. The Plan was developed by six counties, six soil and water conservation districts, and the Lake Heron Watershed District. The watershed issues addressed by the plan are split into three priority levels, A, B, and C. Priority A issues are addressed first followed by B and C. One of the priority A issues is peak flow from altered hydrology and the impacts of altered hydrology on water quality, channel stability, and infiltration rates. The Project is within the headwaters section of the watershed plan.

Murray County Watershed Plan: The Murray County Watershed Management plan was developed by the Murray County Local Watershed Management Plan Task Force in 2017[7]. The purpose of the plan are to identify polluted surface and groundwater resources, prioritize polluted water restoration, and implement restoration projects. The local watershed plan was developed in accordance with Minn. Stat. § 103B.311, Subd. 4.

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

The site's existing and planned land use is consistent with Murray County's planning and zoning requirements. The site is currently zoned as Agricultural and Special Protection by Murray County[11].

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.

No existing critical facilities are present on the project site, and none are proposed.

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

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[6] Skandia WMA | Minnesota DNR

[9] https://cms9files.revize.com/murraycounty/environmental/Miscellanous/Des%20Moines%20River%20Watershed%20CWMP.pdf?t=202410211319170&t=202410211319170

[7] Water Plan

[11] https://cms9files.revize.com/murraycounty/Government/Ordinances/Zoning/County%20Zoning%20Map.pdf?t=202602111654330&t=202602111654330

The proposed project is an enhancement of existing “hunting grounds” to provide multiple benefits for wildlife habitat, floodplain connectivity, and water quality. Therefore, the proposed project is compatible with surrounding land uses.

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

No incompatibility issues with land uses, zoning, or plans have been identified.

11. Geology, soils and topography/land forms:

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

The project area is within the Prairie Coteau subregion of the Northern Glaciated Plains ecoregion, which is characterized by flat to gently rolling hills made up of glacial drift sediments. The bedrock in the project area consists of Precambrian age metamorphic and Cretaceous age sedimentary formations. Depth to bedrock ranges approximately 300 to 400 feet.

Karst topography can be found in regions of sedimentary deposition, specifically limestone and dolostone bedrock. These calcite-rich rocks are prone to dissolution that can create caves, sinkholes, and springs. Most karst features in Minnesota are located in the southeastern portion of the state in the Driftless region. Due to the type (mainly quartzite and sandstone) and depth (greater than 300 feet) of bedrock, the risk of karst formations in the project area are negligible.

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

Surficial material consists of glacial till originating from lake and stream sediments. Clay to silty clay loam soils dominate the project area and approximately 40 percent of the soil in the project area has a hydric soil rating. The table below indicates soil types across the project area and the upstream contributing watershed for hydrologic modeling purposes. Excavation quantities for the project total 22,000 cubic yards of existing in-situ soil material. Imported soil material is not anticipated for the project. Excess soil material from the channel excavation will be repurposed via leveling and reseeding in the WMA property.

Map Unit Symbol	Map Unit Name	Acres in Project Area	Percent of Project Area	Hydric Rating
J23A	Lamoure silty clay loam, 0 to 2 percent slopes, occasionally flooded	71	30.0	Yes
J96C2	Barnes-Buse complex, 6 to 12 percent slopes, moderately eroded	52.9	23.0	No
J100D2	Buse, eroded-Wilno complex, 12 to 18 percent slopes	30.2	13.1	No
J107A	Lakepark-Roliss-Parnell, depressional, complex, 0 to 3 percent slopes	18.3	8.0	Yes
J106B	Barnes, occasional saturation-Buse-Svea complex, 1 to 6 percent slopes	16.1	7.0	No
J95F	Buse, stony-Wilno complex, 25 to 40 percent slopes	10.7	4.7	No
J26B	Darnen loam, 2 to 6 percent slopes	7.5	3.3	No
J42C	Sandberg-Arvilla complex, 6 to 12 percent slopes	5.1	2.2	No
J101B	Hokans-Svea complex, 1 to 4 percent slopes	5	2.2	No
J11A	Vallers clay loam, 0 to 2 percent slopes	4.6	2.0	Yes
J232B	Barnes, occasional saturation-Buse-Arvilla complex, 2 to 6 percent slopes	2.9	1.3	No
J57A	Balaton loam, 1 to 3 percent slopes	2.2	1.0	No
J236A	Highpoint Lake silty clay, 0 to 2 percent slopes	1.7	0.7	No
J1A	Parnell silty clay loam, depressional, 0 to 1 percent slopes	0.7	0.3	Yes
J199A	Fulda silty clay, 0 to 2 percent slopes	0.6	0.3	Yes
J195B	Poinsett-Waubay silty clay loams, 1 to 6 percent slopes	0.4	0.2	No
J235C2	Buse, moderately eroded-Barnes, moderately erodedArvilla complex, 6 to 12 percent slopes	0.1	0.0	No
	Total	230	99.3	

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 focuses on the restoration of a channelized stream segment (unnamed stream 1-037-055-007) within the Skandia WMA boundary. The downstream reach (AUID 07100001-632) is a 2Bg Use Class and is impaired for Aquatic Life with additional impairments for Fish Bioassessments and Invertebrate Bioassessments. The specific fish and macroinvertebrate impairments for this section for the downstream reach are nitrates, physical instream habitat and altered hydrology.
The downstream receiving water is Lake Maria (51006200) which is not impaired. The project is located within the Hydrologic Unit Code 071000001 (Des Moines Headwaters).

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.

A calcareous fen is located to the south of the project site approximately 500 feet. Some smaller seeps within the project vicinity have been identified by MnDNR staff. No wells exist on the project property, though there are four nearby wells serving residential and agricultural uses in the site ranging from 58 to 458 feet in depth.

Unique Well ID: 744734	Depth 65 ft
Unique Well ID: 199411	Depth 58 ft
Unique Well ID: 744728	Depth 485 ft
Unique Well ID: 552705	Depth 112 ft

The site is not within a DWSMA or Wellhead Protection Area.

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

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

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

Wastewater other than that generated from temporary construction portable toilet(s) are not anticipated with the project.

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

There will be no wastewater discharge to any subsurface sewage treatment systems.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate

impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.

There will be no effects to surface or groundwater from wastewater discharges.

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 or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

The project ultimately improves floodplain storage and reduces velocities within the Skandia WMA which ultimately flows to Lake Maria. The proposed channel geometry and floodplain storage has been conservatively sized based on NOAA Atlas 14 precipitation values and a detailed hydrologic and hydraulic model. Overall discharge volumes, rates, and change in pollutants will decrease with the project activity. No new impervious surface is anticipated with the project construction and therefore permanent stormwater management is not proposed. A stormwater pollution and prevention plan (SWPPP) will be in place during project construction. The BMPs described in the SWPPP have been selected to mitigate excess sediment in streams during construction. The BMPs selected for the project include but are not limited to silt curtain placed in the water, silt fence, bio logs, mulch, and erosion control blanket. Additionally, water will not be diverted to the new channel until appropriate erosion control and vegetation is established to avoid excess sedimentation downstream. The project ultimately disturbs 28.5 acres to complete the stream and wetland restoration activities.

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

Water appropriation is not anticipated with the project 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.

   A wetland delineation was completed in June 2025 (see Figure 5). No existing wetlands will be impacted with the project construction. Several shallow scrapes within the project's floodplain are proposed to create micro-pools and wetland habitat to improve biodiversity and water quality within the WMA. No compensatory wetland mitigation is required for the project.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, 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 project directly addresses a historically channelized stream segment and restores natural channel geomorphology that would be expected with a stream of this type. Rosgen and DNR Natural Channel design calculations were a key component to sizing and siting the restored channel. Alterations to the unnamed stream are described in section 6.b. The unnamed stream would be directly impacted during the re-grading and will change the shape of the channel. For in-water work, a turbidity curtain will be installed to minimize the transport of sediment downstream during construction. The project would help aid in addressing the impairments associated with the downstream reach and would have a positive long-term impact on hydrology. Neither the existing or restored channels are suitable for watercraft usage.

13. Contamination/Hazardous Materials/Wastes:

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

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

The MPCA's What's in my Neighborhood database search yielded several feedlots (hog farms) within the vicinity of the Skandia WMA. There are no known contamination sources within the WMA property or adjacent that would be exacerbated by the project. In the event the contractor uncovers drums, solid waste, or contaminated soils they will be advised to stop construction and consult with the design engineer and County Hazardous Waste staff or MPCA staff as required.

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

   A 36-inch concrete culvert will be disposed of with the project, while a 42-inch corrugated metal pipe culvert is anticipated to be re-used with the project. Temporary synthetic erosion controls (e.g. silt fence) are anticipated to be included in the project waste. Natural net blankets will be utilized to avoid plastic net waste/contamination and impacts to wildlife. A temporary portable toilet is anticipated to serve construction crews during construction.

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any 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 adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

   All construction activities will be in accordance with the MPCA Construction General Permit and requirements regarding Good Housekeeping including of construction vehicle related chemicals and refueling operations.

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

   Very small quantities of hazardous waste (e.g. lubricants and hydraulic fluid for construction equipment) is anticipated to be generated with the project. All waste will be managed in accordance with local and state hazardous waste laws.

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.

   The proposed project is within the Prairie Parkland Province, North Central Glaciated Plains Section, and the Coteau Moraines subsection as of the DNR Ecological Classification System[13]. The Prairie Parkland system is classified by tallgrass prairie and wetlands. After European settlement, much of

the prairies were plowed and less than 1% of the original prairie remains. The Coteau Moraines subsection is a windy habitat scattered with shallow lakes and wetlands. The primary land use is agriculture[8].

The MnDNR Natural Heritage Information System (NHIS) data review did not return any results for state listed species within the Project area (Attachment A).

The USFWS Information for Planning and Consultation Tool (IPaC) indicated that three proposed federally listed species have the potential to occur within the Project's vicinity (Attachment E). The three species are the Suckley's cuckoo bumble bee (*Bombus suckleyi*) which is proposed endangered, the monarch butterfly (*Danaus Plexippus*) and the western regal fritillary (*Argynnis idalia occidentalis*) that are both proposed threatened (Attachment E). None of the three species have designated critical habitat that overlaps with the Project area. The IPaC identified seven migratory birds with the potential to occur in the Project area. The seven species are: bald eagle (*Haliaeetus leucocephalus*), black tern (*Chlidonias niger surinamenisis*), chimney swift (*Chaetura pelagica*), Franklin's gull (*Leucophaeus pipixcan*), grasshopper sparrow (*Ammodramus savannarum perpallidus*), lesser yellowlegs (*Tringa flavipes*), pectoral sandpiper (*Calidris melanotos*), and western grebe (*Aechmophorus occidentalis*).

There are four Minnesota Department of Agriculture Approved County Noxious Weeds in Murray County[9]. The four species are velvetleaf (Abutilon theophrasti Medik), non-licensed hemp (Cannabis sativa L.) common cocklebur (Xanthium strumarium L), and common sunflower (Helianthus annuus L.). The common cocklebur and common sunflower are approved with restrictions because they are native species. Additionally, there are seven waterbodies that are listed by the MN DNR as infested within Murray County[10]. The closest is Sarah Lake, which is listed as infested for zebra mussels, and is approximately 2 miles northeast of the Project area. There are no listed infested waterbodies within the Project area.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-_____) and/or correspondence number (MCE-2026-00064) from which the data were obtained and attach the Natural Heritage Review letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

   A calcareous fen (Skandia WMA, Fen ID# 42026) is located immediately south of the stream restoration project area (Attachment A). The design team has consulted with MN DNR staff (Calcareous Fen Program Coordinator, Regional Ecologist, South (Region 4), and Regional Environmental Assessment Ecologist, South (Region 4) to ensure the project will not impact the hydrology or hydraulics of inflows or outflows from the fen. The project maintains a 500-foot spatial separation from the existing calcareous fen on the project site. The site was predominantly agricultural prior to the acquisition by the MN DNR for development/expansion of the WMA. The site has been planted with native prairie grasses and forbs, and the project disturbances will ultimately further enhance the site's biodiversity with native plantings, stream stabilization enhancements, and wetland creation/restoration.

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on

[8] https://www.lrl.mn.gov/docs/2006/other/060316.pdf
[9] https://www.mda.state.mn.us/countynoxiousweeds
[10] https://www.dnr.state.mn.us/invasives/ais/infested.html

introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The contractor will ensure all construction vehicles are free of soil and debris that may transport seeds or other invasive species to the project site prior to arrival. The reconstructed channel will be built predominantly outside of the existing channel to minimize the duration of aquatic impacts. Once the new channel has been constructed and is stabilized, the old channel will be routed to the new channel and filled with soil. Upland areas will utilize certified weed free mulch erosion control. Exposed soils will be reseeded following channel restoration. Streambanks, wet mesic prairie, and mesic prairie seed mixes will be used to establish vegetation cover (Figure 4).

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

The project's primary purpose is to improve water quality and habitat within the Skandia WMA. As previously stated, the rare calcareous fen feature to the south is 500 feet away from the project. A final project plan, reviewed by the MN DNR, will be implemented to ensure that there is no net effect on the calcareous fen. During construction, silt curtain, and temporary sediment control will be utilized to prevent sediment from traveling downstream. The channel design ensures appropriate aquatic organism passage and lengthens the lineal distance of stream channel within the WMA. The total proposed stream restoration length is 3,193 feet. Following restoration, exposed soils will be reseeded using a native vegetation mix as shown in Figure 4. The seed mixes are being developed and reviewed by MN DNR ecologists and wildlife managers. The restoration plan seed mixes will match soil types provided by the MN DNR.

15. Historic properties:

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

Project documentation related to the proposed Skandia WMA Stream Restoration in Murray County was reviewed for potential effects to archaeological sites and historic properties under the Minnesota Field Archaeology Act (Minn. Stat. 138.40) and Minnesota Historic Sites Act (Minn. Stat. 138.665).

Archival research indicates that no significant archaeological sites, designated State Historic Sites, or Properties listed on the State or National Registers of Historic Places have been documented within the Project Area of Potential Effect (APE). This review also recognizes that earth-moving associated with the project will be confined to existing floodplain wetlands and areas of previous disturbance. Channeling of the county ditch has significantly impacted subgrade deposits and review of aerial imagery indicates the parcel was cultivated until 2019. The Prehistoric Hydrography layer on the Office of the State Archaeologist Portal indicates the area was covered with water before modern tiling, and U.S. Department of Agriculture soil data reveal hydric subsoils with the water table at a depth of 6-18 inches.

No significant archaeological or historic sites are known or predicted to exist within the Project APE, nor have designated State Historic Sites or Properties listed on the State or National Registers of Historic Places been documented in Skandia WMA.

16. Visual:

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

The project enhances topographic features within the WMA property with regard to restoration of stream areas and creation of shallow depressions to provide wetland habitat. There would be temporary impacts during construction and from on-site equipment. Potential temporary visual impacts include dust, light glare, and emission vapors. Temporary impacts from construction would affect nearby residents, roadway users, and recreationists. Impacts would be mitigated through dust suppression, by limiting construction to daylight hours, and by orienting construction lights to avoid glare.

17. Air:

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

   The Project does not include new stationary sources of air emissions.

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

   The Project is expected to require two diesel-fueled construction vehicles to facilitate culvert removal and replacement, stream contouring, and handling of aggregate and soil. Construction vehicles are anticipated to operate approximately 12 hours per day for 52 days to accomplish project goals.

   One gasoline-fueled pump is anticipated to allow for surface water diversion during culvert replacement activities. This pump is assumed to operate continuously for 3 days to accomplish project goals.

   Transport of Project personnel is required throughout the construction process. Four on-road gasoline-powered vehicles commuting 400 miles weekly for 9 weeks is assumed.

   Construction contractors may implement a Diesel Idling Prevention Plan to limit fuel combustion and excess GHG emissions. To the extent practicable, construction vehicles will remain on site throughout the construction process to reduce transport emissions.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

Fugitive dust from the Project may be emitted from truck traffic and material handling activities during construction. Fugitive dust emissions are expected to be limited to handling of existing and additional road-base aggregate during culvert replacement. There are 28 residences within 2 miles of the project. The nearest town, Balaton, MN is approximately 7 miles away. The use of clean gravel is recommended to reduce dust emissions and prevent sedimentation into the underlying waterbody. Dust emissions from truck traffic can be managed by reducing travel speed on gravel access roads, through BMPs (i.e. sourcing clean gravel or wetting the roadway prior to construction traffic), and the construction contractor's SWPPP requirements.

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 come to that conclusion and any GHG emission sources not included in the total calculation.

Minnesota Environmental Quality Board, in the June 2024 publication "Environmental Assessment Worksheet (EAW) Guidance - Developing a carbon footprint and incorporating climate adaptation and resilience," defines a carbon footprint as the total greenhouse gas emissions associated with a project. This includes greenhouse gas emissions from direct use of fuel, such as providing heat to a building or fuel in a car. It also includes greenhouse gases that come from producing the goods or services necessary to complete a project, including emissions from power plants that make electricity or factories that make the products used in the project. It also encompasses the emissions associated with any involved products' disposal.

A carbon footprint generally includes any upstream and downstream emissions from a project. Upstream emissions include those related to the production, acquisition, or transportation of goods or services required for the project. Downstream emissions include those related to the handling and disposal of any resultant products at the end of their life.

At a minimum, a proposed project's carbon footprint includes, but is not limited to, identification and assessment of:

- Sources of GHG emissions associated with the proposed project
- Types of GHG emissions
- Amount of GHG emissions from those sources
- Reduction of GHG emissions from planned mitigation

Direct emissions are emissions released directly from properties owned or under the control of the project proposer. These are also commonly referred to as "Scope 1" emissions. This includes emissions from on-site energy use and mobile equipment during construction.

Indirect emissions originate either upstream or downstream of the project. They are also commonly referred to as "Scope 2" and "Scope 3" emissions. Scope 2 emissions are emissions associated most often with the offsite generation of purchased electricity, steam, and heating and cooling.

Scope 3 emissions are from the offsite provision of waste management services, including land disposal (landfilling), recycling, and solid waste composting, use of sold products, and transportation and distribution for waste management. According to the Environmental Protection Agency, "Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly affects in its value chain. Scope 3 emissions include all sources not

within an organization's scope 1 and 2 boundaries. Scope 3 emission sources include emissions both upstream and downstream of the organization's activities."

State-level reporting of GHG emissions to the Minnesota Legislature under the Next Generation Energy Act is limited to the following set of gases:

- carbon dioxide (CO_2)
- nitrous oxide (N_2O)
- methane (CH_4)
- sulfur hexafluoride (SF_6)
- two families of gases known as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs)

GHG emissions are reported in CO_2-equivalent (CO_2e) short tons (English units). GHG emissions are converted to CO_2e units by multiplying nominal estimated emissions of each gas, in short tons, by its global warming potential (GWP). A GWP is a factor that converts emissions of any one GHG to its equivalent in tons of emitted CO_2. The 2007 version of GWPs developed by the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) are used in this report on a 100year time horizon (Table 18-1).

Table 18-1 IPCC AR4 GWP over a 100-year time horizon

Greenhouse gas	**Chemical formula**	**Global warming potential (tons CO_2e)**
Carbon dioxide	CO2	1
Methane	CH4	25
Nitrous oxide	N2O	298
Sulfur hexafluoride	SF6	22,800
Nitrogen trifluoride	NF3	17,200
Hydrofluorocarbons		
HFC-23	CHF3	14,800
HFC-32	CH2F2	675
HFC-125	C2HF5	3,500
HFC-134a	CH2FCF3	1,430
HFC-143a	C2H3F3	4,470
HFC-152a	CH3CHF2	124
HFC-227ea	C3HF7	3,220
HFC-236fa	C3H2F6	9,810
HFC-245fa	C3H3F5	1,030
HFC-365mfc	C4H5F5	794
HFC-4310mee	CF3CFHCFHCF2CF3	1,640
Perfluorocarbons		
PFC-14 (Perfluoromethane)	CF4	7,390
PFC-116 (Perfluoroethane)	C2F6	12,200
PFC-218 (Perfluoropropane)	C3F8	8,830
PFC-31-10 (Perfluorobutane)	C4F10	8,860
PFC-51-14 (Perfluorohexane, FC-72)	C6F14	9,300

GHG emissions are reported by source, type, and project phase (i.e., construction, operations), and emissions are to a project total (Table 18-2). Considering the 100-year time horizon of the GHG GWPs for project emissions and sinks, and the long-term ecosystem management objectives of the Project, an estimated Project lifetime of 100 years was used to annualize GHG emissions. Emissions from the

construction of the Project, spread over 100 years, in addition to the projected annual operating emissions for the Project, amounts to net lifetime GHG emissions of 90.28 tons of CO_2e.

Table 18-2 Project GHG Emissions

Scope	Project Phase	Type of Emission	Emission Sub-type	Total GHG Emissions (tons GHG)	Total Project-related CO_2e Emissions (tons CO_2e)
Scope 1	Construction	Combustion	Construction Equipment Operation	CO_2: 70.081 CH_4: 0.0069 N_2O: 0.00646	72.18
Scope 1	Construction	Combustion	Commuting Vehicles	CO_2: 5.7805 CH_4: 0.0002 N_2O: 0.00014	5.83
Scope 1	Construction	Combustion	Pump Operation	CO_2: 1.39 CH_4: 0.0011 N_2O: 0.00008	1.44
Scope 1	Operation	Combustion	Commuting Vehicles	CO_2: 1.4454 CH_4: 0.00004 N_2O: 0.00004	1.46
Scope 1	Operation	Combustion	Mowing Equipment Operation	CO_2: 0.5214 CH_4: 0.0004 N_2O: 0.0002	0.59
Scope	**Project Phase**	**Type of Emission**	**Emission Sub-type**	**Total GHG Emissions (tons GHG)**	**Total Project-related CO_2e Emissions (tons CO_2e)**
Scope 3	Construction	Material production	Culvert production and transport	CO_2e: 10	10
Scope 3	Construction	Material Disposal	Landfill emissions	CO_2: 0.242	0.24
TOTAL Project GHG Emissions:		**90.28 tons CO2e**		**Annualized Project GHG Emissions (100 yr):**	**0.9 tons CO2e/yr**

Assumptions and Calculation Methods

Scope 1 mobile equipment emissions were determined by estimating vehicle fuel consumption or mileage traveled to complete the Project objectives and referencing the most recent version of the Environmental Protection Agency's Center for Corporate Climate Leadership (CCCL) Simplified GHG Emissions Calculator Tool[11]. The latest version of the calculator tool references the IPCC Fifth Assessment Report (AR5) GWPs, so individual GHG emissions were converted to tons CO_2e using the preferred AR4 GWPs for this report.

For mobile combustion sources, emissions of CO_2 from fossil fuel combustion are calculated using the equation:

[11] EPA Center For Corporate Climate Leadership. Simplified GHG Emissions Calculator Tool. Accessed Online December 2025 at: https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator

*tons CO_2 = fuel use in physical units *CO_2 Emission Factor (kg CO_2/physical unit of fuel use) * Conversion of kg to tons*

The equation for CH_4 and N_2O is:

*tons CO2e = Vehicle Miles Traveled * CH4/N2O Emission Factor (g/mile) * Conversion of g to tons * GWP*

Scope 1 Emission Sources	Project Phase	Assumptions	Calculator inputs
Construction Equipment	Construction	Two construction vehicles operating 12 hours per day for 52 days, consuming 5 gallons of diesel fuel per hour	6,240 gallons diesel fuel
Crew Commuting	Construction	Four gasoline-fueled light duty trucks traveling 360 miles per week for 9 weeks	12,960 miles traveled
Pump Operation	Construction	One gasoline-fueled 2-stroke pump operating 24 hours per day for 3 days, consuming 2 gallons of gasoline per hour	144 gallons gasoline fuel
Crew Commuting	Operation	One gasoline-fueled light duty truck traveling 1,080 miles per year for 3 years.	3,240 miles traveled
Mowing Equipment	Operation	One gasoline-fueled 2-stroke mower operating 12 hours per day for 3 days per year for 3 years at 0.5 gallons gasoline per hour	54 gallons gasoline fuel

Scope 3 Project waste disposal was determined by estimating the mass of old culvert materials for disposal and referencing the most recent version of the Environmental Protection Agency's Center for Corporate Climate Leadership (CCCL) Simplified GHG Emissions Calculator Tool. The simplified formula for calculating GHG emissions from waste generation is:

*tons CO2e = mass of waste material (tons) * Emission Factor * GWP*

Scope 3 Project material production was determined by estimating the mass of new culvert materials for disposal and referencing the most recent version of the Minnesota Department of Transportation's Minnesota Infrastructure Carbon Estimator (MICE) Tool.[12] The MICE calculator estimates the lifecycle GHG emissions from the construction and maintenance of transportation infrastructure, including the upstream energy and emissions associated with project materials and transportation to the Project site.

*tons CO2e = mass of new material (tons) * Emission Factor * GWP*

Scope 3 Emission Sources	Project Phase	Assumptions	Calculator inputs
Material production - New culvert	Construction	Single Box Culvert, size small (6'x6'), culvert length 30', locally sourced	Single Box Culvert, size small (6'x6'), culvert length 30', hauling distance short
Material Disposal - Old culvert	Construction	10 tons of concrete and 1 ton of structural steel disposed at landfill	10 tons of concrete landfilled; 1 ton of structural steel landfilled

[12] Minnesota Department of Transportation. Greenhouse gas emissions analysis. Minnesota Infrastructure Carbon Estimator (MICE). Available at: https://www.dot.state.mn.us/sustainability/ghg-analysis.html. Accessed December 2025.

b. GHG Assessment

i. Describe any mitigation considered to reduce the project's GHG emissions.

Mitigation strategies considered for the Project include:

- Implementing a no-idling policy for construction equipment to limit engine idling to equipment working periods only, and only when the availability of the equipment's function is required as part of an ongoing task.
- Use of recycled concrete aggregate as a substitute for base stone in new culvert construction
- To the extent practicable, construction materials should be sourced and disposed of near the project site.
- Temporary soil stabilization and sediment control BMPs should prioritize non-toxic biodegradable materials to be left in place, reducing subsequent ground disturbance, material disposal, and equipment emissions.
- To the extent practicable, the construction contractor should limit transportation of equipment and personnel to the site and use biogenic fuel options for equipment and vehicles (biodiesel, bioethanol, electric vehicles, etc.).
- To the extent practicable, pumps should be operated in a manner that allows for float activation, reducing operation to periods of high-water flow and increasing water retention time upstream.

ii. Describe and quantify reductions from selected mitigation, if proposed to reduce the project's GHG emissions. Explain why the selected mitigation was preferred.

Due to the necessary equipment use and materials, the Project emission sources provide limited opportunity for climate mitigation strategies. However, carefully sourcing local materials and disposal sites, in addition to limiting personnel transportation by carpooling and lodging near the site, would result in modest GHG reductions. For instance, a no-idling policy resulting in a 5% reduction in equipment operating time would result in a 3.6-ton CO_2e reduction in total Project GHG emissions. Use of recycled concrete aggregate as a substitute for base stone in new culvert construction would result in 0.1-ton CO_2e reduction in total Project GHG emissions.

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.

Net lifetime GHG emissions associated with the Project are 0.9 tons CO_2e/yr. Minnesota's Climate Action Framework, published in 2022, sets forth the goal of reducing the state's GHG emissions by 50% by 2030 and of achieving "net-zero" emissions by 2050.[13] These are more ambitious targets than those enacted by the state in 2007 via the Next Generation Energy Act,[14] reflecting advances in the climate science and the growing global response. They are aligned with the international agreements to take steps to limit global warming to 1.5 degrees Celsius.

The Project addresses many of the priority actions stated in Minnesota's Climate Action Framework, specifically Goal 2: Climate-smart natural and working lands. These actions include management of

[13] Minnesota's Climate Action Framework. Available at: https://climate.state.mn.us/sites/climateaction/files/Climate%20Action%20Framework.pdf. Accessed December 2025.
[14] Minn. Stat. § 216J.02, subd. 1.

wetlands for increased carbon sequestration and storage, producing resilient landscapes and ecosystems to enhance the ability of plants and animals to adapt to the effects of climate change, increase water storage and infiltration, and manage drainage to reduce runoff and minimize downstream flooding, erosion, and habitat loss.

A recent study published in Nature Geoscience by Tölgyesi et al. in 2025 emphasizes the significant potential for restoration of open ecosystems (grasslands, shrublands, and wetlands) to store substantial amounts of carbon, particularly underground, among other climate change mitigation benefits such as increasing albedo and providing resilience to fire and drought.[15] The study cautions that ecosystem restoration may have a limited role in mitigating global climate change; however, protecting biodiversity and strengthening ecosystem resilience can play an important role in strengthening local adaptation to climate change.

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 state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing noise sources within the vicinity of the Project area come from nearby road use, agricultural operations, and residential properties. The nearby sensitive receptors are residential properties and recreational areas. Noise impacts would be limited to construction and would be temporary. Noise would be generated by construction equipment used during grading and restoration. Increased noise during the construction period could impact the local residents and recreational users. The Project will not generate permanent noise and will comply with state and local noise standards.

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 alternative transportation modes.

   The Project construction will take place on both the North and South sides of 201st Street. Construction will impact the traffic during culvert replacement and road crossing modifications. Additionally, during traffic delays may be caused by equipment mobilization and site access. Staff parking and construction equipment storage may cause further delays in transportation.

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

[15] Tölgyesi, C., Csikós, N., Temperton, V. M., Buisson, E., Silveira, F. A. O., Lehmann, C. E. R., Török, P., Bátori, Z., & BedeFazekas, Á. (2025). Limited carbon sequestration potential of ecosystem restoration until 2100. Nature Geoscience, 10, 1742.

Daily construction crews and Project mobilization are not expected to significantly impact traffic conditions. The existing traffic on 201st Street is very low, and the road is seldom used. Local residents and roadway users may be temporarily delayed or rerouted during culvert instillation and road improvements. Additionally, during equipment mobilization, roadway users may experience slower driving speeds. The Project is not anticipated to permanently impact traffic conditions.

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

If needed road signs and traffic flaggers would be utilized to minimize impacts. Traffic impacts would be limited to the construction period and notification to residents would be provided prior to road closures.

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

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

The proposed project consists of restoration of a historically channelized stream reach and associated floodplain wetlands within the Skandia Wildlife Management Area (WMA). The project related environmental effects are construction related. The temporary construction period is anticipated during the winter of 2026 through the spring of 2027. The temporary impacts are limited to the project site and downstream water resources.

Construction activities would result in temporary disturbance of approximately 28.5 acres associated with channel excavation, grading, culvert replacement, wetland scrape construction, and restoration activities. Potential short-term cumulative effects associated with the proposed project are limited primarily to temporary construction disturbances such as localized noise, dust, localized sediment disturbance, and short-term impacts to aquatic habitat. However, these effects would be limited in duration and extent and would occur in conjunction with implementation of erosion and sediment control best management practices, turbidity controls, native revegetation, and construction sequencing designed to minimize disturbance. As a result, cumulative construction-related effects are not expected to result in significant degradation of downstream water resources, wildlife habitat, or surrounding land uses.

Noise

Noise is anticipated to be temporary, localized, and minimized through implementation of phased construction sequencing, timing restrictions, and compliance with state and federal permit conditions. The geographic scope for noise is limited to the project area and adjacent areas. The temporal scope includes short-term construction activities anticipated to occur between the winter 2026 and spring 2027.

Dust

Dust is anticipated to be temporary, localized, and minimized through implementation of phased construction sequencing, timing restrictions, and compliance with state and federal permit conditions. The geographic scope for noise is limited to the project area and adjacent areas. The temporal scope includes short-term construction activities anticipated to occur between the winter 2026 and spring 2027.

Vegetation Disturbance
Vegetation disturbance is anticipated to be temporary, localized, and minimized through implementation of native planting mitigation, erosion and sediment control best management practices (BMPs), phased construction sequencing, wildlife-friendly erosion control measures, and compliance with state and federal permit conditions. The geographic scope for vegetation disturbance is limited to the project area. The temporal scope includes short-term construction activities anticipated to occur between the winter 2026 and spring 2027.

Turbidity
Turbidity is anticipated to be temporary, localized, and minimized through implementation of erosion and sediment control best management practices (BMPs), phased construction sequencing, wildlife-friendly erosion control measures, and compliance with state and federal permit conditions. The geographic scope for turbidity is limited to the project area and downstream of the project. The temporal scope includes short-term construction activities anticipated to occur between the winter 2026 and spring 2027.

Potential long-term cumulative effects include changes in aquatic and wetland cover types. Based on the scale, duration, and localized nature of construction impacts, the proposed project is not expected to contribute to significant adverse cumulative environmental effects.

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

DNR Staff contacted Murray County, the area highway department and the watershed district to identify if there were other pending or known projects expected to occur in the area. No reasonably foreseeable development projects with a known basis of expectation have been identified within or adjacent to the project area that would be expected to interact with the environmental effects of the proposed restoration project. The surrounding landscape consists primarily of agricultural lands, prairie habitats, wetlands, and lands managed for wildlife and recreation within the Skandia WMA. No future phases of development associated with this project have been identified, and no known public or private development projects are anticipated to occur within the project area that would substantially alter existing land use patterns.

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

Temporary construction-related effects, including noise, dust, vegetation disturbance, in-water work, and turbidity, will be minimized through implementation of BMPs, sediment and erosion control measures, dewatering controls, native revegetation, permit compliance, and construction sequencing requirements.

Given the localized and temporary nature of construction impacts, the absence of substantial hydraulic interaction with other projects, the implementation of mitigation and BMP measures, there is no evidence that the proposed project would contribute to significant adverse cumulative environmental effects.

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 how the environment

will be affected, and identify measures that will be taken to minimize and mitigate these effects.

There are no other anticipated environmental impacts that were not discussed in the EAW sections 1-21.

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

I hereby certify that:

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

Signature Yvette Gault 2026.06.17 16:39:27 -05'00' Date 6/17/2026

Title: Environmental Review Project Manager