

Silver Rapids Lodge

Environmental Assessment Worksheet *Fall Lake Township, Lake County, Minnesota*

June 17, 2026

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REPORT FOR:
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Greenhouse Gas Calculations

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:**

Silver Rapids Lodge

2. **Proposer:**

Leisure Hotels and Resorts
 Contact person: Jamie C. Tatge
 Title: President / New Business Development
 Address: 14275 Golf Course Dr, Ste 140
 City, State, ZIP: Baxter, MN 56425
 Phone: 218.330.6554
 Fax: N/A
 Email: jtatge@leisurehotel.com

3. **RGU:**

Lake County
 Contact person: Tanya Feldkamp
 Title: Environmental Services Manager
 Address: 601 3rd Ave
 City, State, ZIP: Two Harbors, MN 55616
 Phone: 218.834.8441
 Fax: N/A
 Email: Tanya.Feldkamp@co.lake.mn.us

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

Required:

- ☐ EIS Scoping
☐ Mandatory EAW

Discretionary:

- ☐ Citizen petition
☐ RGU discretion
☒ Proposer initiated

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

N/A

5. **Project Location:**

County: Lake
 City/Township: Fall Lake Township
 PLS Location (Section, Township, Range): Sec. 29 & 32, T63N, R11W
 Watershed (81 major watershed scale): Rainy River – Headwaters major watershed (72)
 Tax Parcel Number(s): 28-6311-29850 & 28-6311-32070
 GPS Coordinates: 91.7579869°W 47.9058924°N
 Mailing address: 459 Kawishiwi Trail, Ely, MN 55731

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

- County map showing the general location of the project. (See Appendix A – Figures 1 & 2)
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); USGS maps at this scale is unreadable due to the linear features and large project area. (See Appendix A – Figure 3)
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan. (See Appendix A – Figures 4 & 5, and Appendix B)

- 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).
(See Section 7)

6. Project Description:

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

Leisure Hotels and Resorts is proposing construction of an update to and expansion of the existing Silver Rapids Lodge resort site located in Fall Lake Township, Lake County, Minnesota. The project will include demolition of a functionally obsolete lodge, the construction of a new lodge, 44 new cabins, as well as other amenities.

- 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.*

- 1) The purpose and need behind this project results from the existing resort being functionally obsolete, economically challenged, and physically at or near the end of its life. This project will result in revitalization of the property to address recreation demand in this area and provide additional amenities for the community (restaurant, beach, etc.). Without this project the ongoing decline of the resort will have a negative environmental impact due to aging infrastructure, environmental liabilities, obsolete buildings, deferred maintenance, contaminated soil cleanup, and the risk of long-term deterioration without reinvestment.

Construction activities that will manipulate the environment will include existing structure demolition, select tree removals, site preparation and earthwork, utility installation, and the construction of new structures including the new lodge, cabins, storage buildings, as well as the construction of roads and parking areas. See Appendix B for the current site plan of the project. Typical construction waste will be generated during the project construction.

- 2) N/A, there are no existing equipment or industrial processes located within the project area.

- 3) Significant demolition will include removal of the existing lodge as well as several cabins.

- 4) The project is planned to be constructed in three phases. Phase 1 is planned, pending project approvals, to begin in 2026. The timing for additional phases will be dependent on market conditions.

- c. *Project magnitude.*

The summary of the magnitude of the development scenario is provided in **Table 6-1**.

Table 6-1. Project Size and Type

Magnitude of Development Scenario	
Total Project Acreage	60.3 Acres
Linear project length	N/A
Number and type of residential units	Existing Cabins – 6 Units Existing Motel – 6 Units Existing Retreat – 1 Unit New Cabins – 44 Units TOTAL: 57 Units
Commercial building area (in acres)	Lodge – 0.2 Acres
Industrial building area (in acres)	N/A
Institutional building area (in square feet)	N/A
Other Uses	See Table 8-1
Structure height(s)	New Cabins – 21.5 Ft New Lodge – 25.5 Ft Existing Motel ~20 Ft Storage Buildings ~20 Ft

- 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 purpose of this project is to revitalize and create new recreational lodging opportunities within Lake County where demand is high for recreational activity and tourism. This project is not being carried out by a governmental unit. Beneficiaries of the project will include people looking for lodging opportunities within the area, local businesses who will benefit from the increased economic activity, as well as local residents who will have new employment opportunities.

- e. *Are future stages of this development including development on any other property planned or likely to happen?*
☐ Yes ☒ No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

Although the project is planned to be constructed in three phases, the entirety of the project is being considered in this EAW.

- 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.

N/A

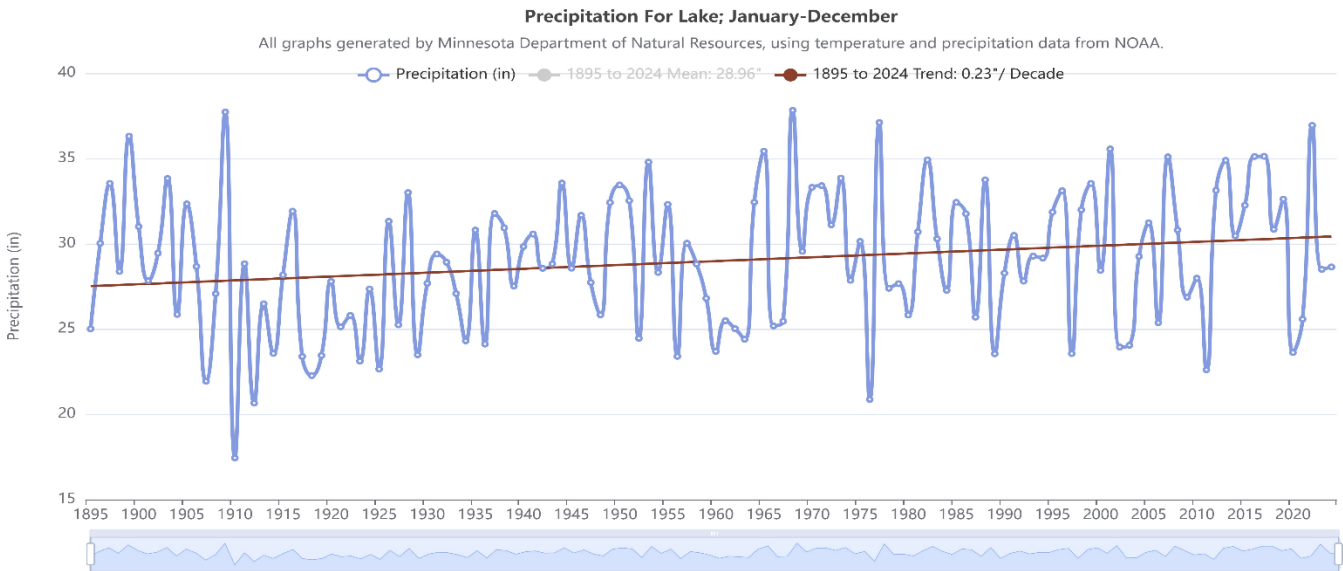
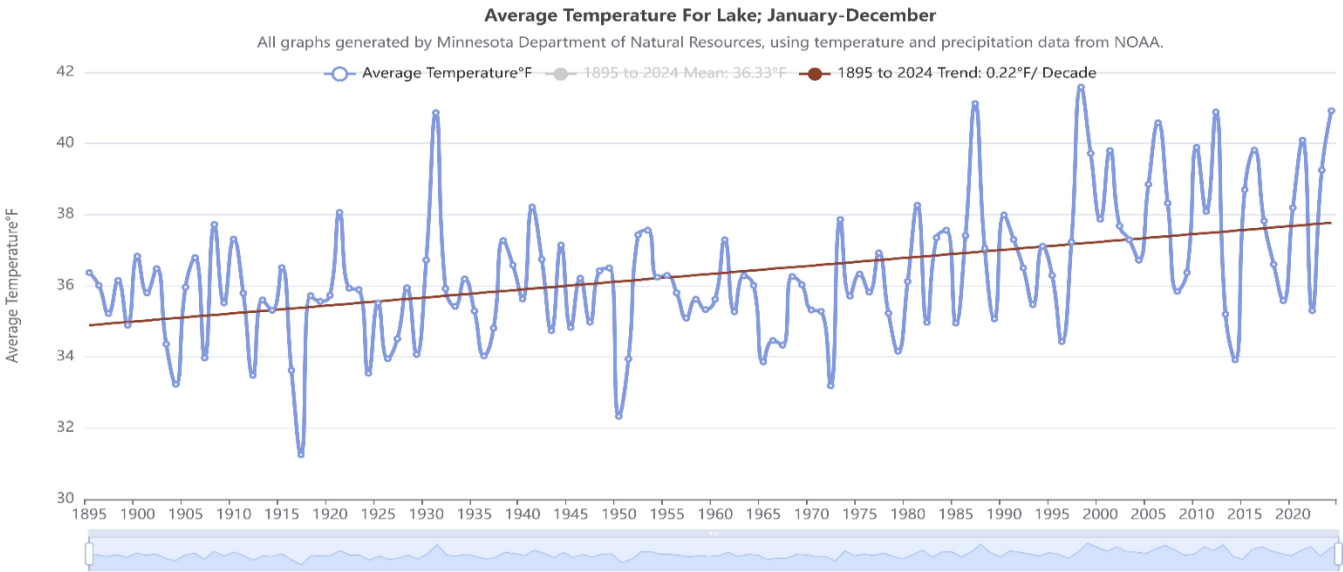
7. Climate Adaptation and Resilience:

- 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.*

Climate trends in Minnesota have included warmer temperatures and increased rainfall. According to the Minnesota Department of Natural Resources (MnDNR) climate trends webpage between 1895 and 2020 average temperatures have warmed by 3.0 degrees Fahrenheit and annual precipitation has increased by an average of 3.4 inches¹. The local trends within Lake County have been generally consistent with the statewide trends as evidenced from the historic climate graphs below from the MnDNR Climate Explorer². Lake County average temperatures have been rising at 0.22 degrees Fahrenheit a decade while precipitation has been increasing 0.23" per decade. These upward trends in average temperature and precipitation are expected to continue at the project site over the life of the Project. Projected climate graphs from Climate Explorer are included below.

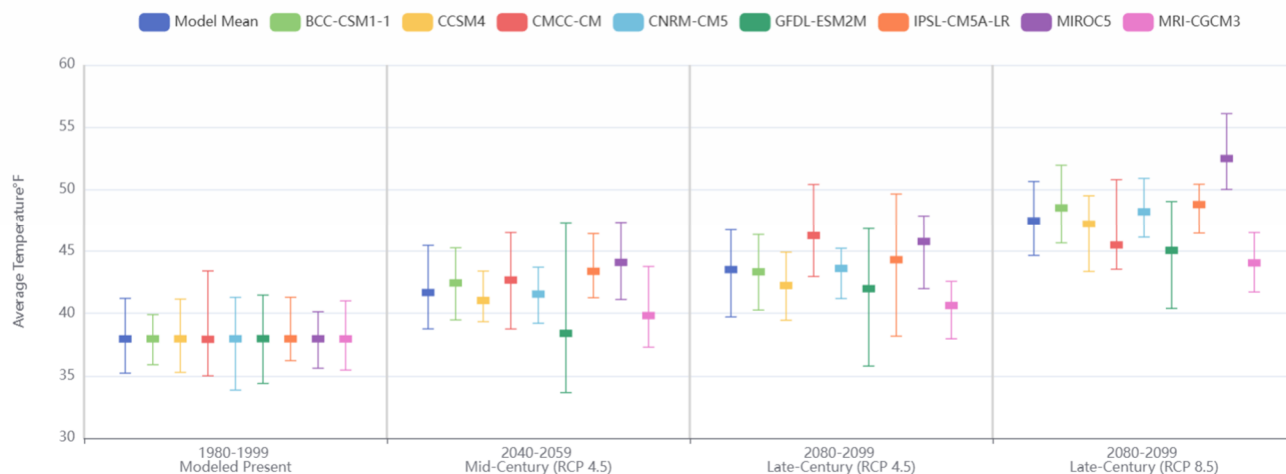
¹ https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html

² <https://climate-explorer.dnr.state.mn.us/main/historical>



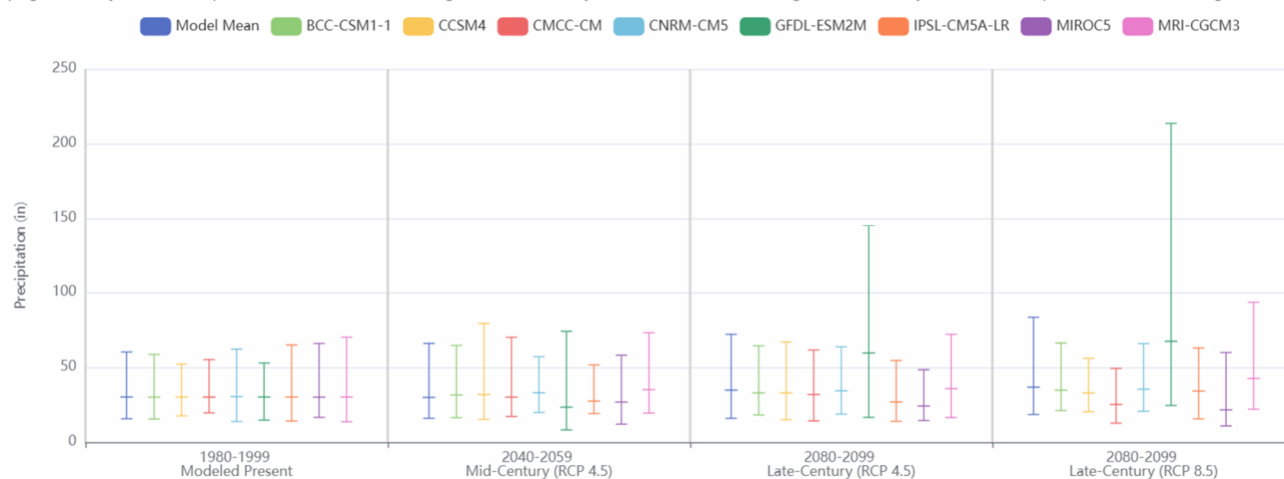
Recent and Projected Future Average Temperature For Lake; January-December

Graph generated by Minnesota Department of Natural Resources using data from University of Minnesota climate modeling. These values may differ from those published in national and global climate assessments.



Recent and Projected Future Precipitation For Lake; January-December

Graph generated by Minnesota Department of Natural Resources using data from University of Minnesota climate modeling. These values may differ from those published in national and global climate assessments.



- 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.

Table 7-1. Climate Considerations and Adaptations

Resource Category	Climate Considerations	Project Information	Adaptations
Project Design	Increased heavy rainfall and flooding.	<i>Climate change risks and vulnerabilities identified include:</i> The increase in impervious surface will result in increased runoff.	The project includes buried stormwater infrastructure designed for storage and treatment.
Land Use	Land use conversion will increase the amount of impervious surface area.	<i>Climate change risks and vulnerabilities identified include:</i> New impervious surface will be created from the project.	The project includes buried stormwater infrastructure designed to store and treat stormwater generated from the site.
Water Resources	Address in item 12.	Address in item 12.	Address in item 12.

Resource Category	Climate Considerations	Project Information	Adaptations
Contamination/ Hazardous Materials/Wastes	Typical construction waste materials will be generated from the construction of the Project.	<i>Climate change risks and vulnerabilities identified include:</i> Wastes generated from construction will likely include solid waste and washout water.	Any hazardous waste products generated or stored within the project area during construction will be properly contained and disposed of.
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	<i>Address in item 14.</i>	<i>Address in item 14.</i>	<i>Address in item 14.</i>

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

Table 8-1 shows existing and proposed land cover types within the Project Area, Table 8-2 shows Green Infrastructure.

Table 8-1. Existing and Proposed Land Cover Types

Land Cover Type	Before		After	
	Acres	Percentage	Acres	Percentage
Brush/Grassland	0.0	0%	6.8	11.3%
Cropland	0.0	0%	0.0	0%
Deep Lakes (>2 meters deep)	0.0	0%	0.0	0%
Green infrastructure TOTAL (*from Table 8-2 Below)	1.6	2.7%	1.6	2.7%
Impervious Surface	5.2	8.6%	9.3	15.4%
Lawn/landscaping	3.6	6.0%	8.2	13.6%
Livestock Rangeland/Pastureland	0.0	0%	0.0	0%
Rivers/Streams	0.0	0%	0.0	0%
Stormwater Pond (Wet Sedimentation Basin)	0.0	0%	0.0	0%
Wetlands and Shallow Lakes (<2 meters deep)	6.4	10.6%	6.4	10.6%
Wooded/Forest	36.2	60.0%	29.6	49.1%
Other (Former Mineral Extraction – Bare Earth/Sparse Vegetation)	7.3	12.1%	0.0	0%
TOTAL	60.3	100%	60.3	100%

Table 8-2. Green Infrastructure

Green Infrastructure*	Before (acreage)	After (acreage)
Constructed Infiltration Systems (Infiltration Basins/Infiltration Trenches/Rainwater Gardens/Bioretenation Areas Without Underdrains/Swales with Impermeable Check Dams)	0.0	0.0
Constructed Tree Trenches and Tree Boxes	0.0	0.0
Constructed Wetlands	0.0	0.0
Constructed Green Roofs	0.0	0.0
Constructed Permeable Pavements	0.0	0.0
Public ROW (<i>Only Non-Imperious Land Included</i>)	1.6	1.6
Other (Describe)	0.0	0.0
TOTAL*	1.6	1.6
Trees	Percent	Number
Percent Tree Canopy Removed or Number of Mature Trees Removed During Development	18%	Unknown
Number of New Trees Planted	-	≈350

Existing land cover can be seen in **Appendix A – Figure 4**. Proposed land cover can be seen in **Appendix A – Figure 5**.

- 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.

All required permits and approvals will be obtained prior to construction. Any necessary permits or approvals not listed in **Table 9-1** have not intentionally been omitted.

Table 9-1. Permits and Approvals

Unit of Government	Type of Application	Status
Minnesota Pollution Control Agency (MPCA)	NPDES Construction Stormwater Permit	To Be Obtained
Minnesota Department of Natural Resources (MnDNR)	Water Appropriations Permit Revisions	To Be Obtained (if needed)
	Mooring Space Permit	To Be Obtained (if needed)
Minnesota Department of Health (MDH)	Drinking Water Supply Construction Permit	To Be Obtained
	Well Registration(s)	To be Submitted

Unit of Government	Type of Application	Status
Lake County	Conditional Use Permit	To Be Obtained
	Grade/Fill Permit	To Be Obtained
	Structure Placement Permit	To Be Obtained
	Subsurface Sewage Treatment System Permit	To Be Obtained
	Wetland Exemption	To Be Obtained

10. Land Use:

a. Describe:

- i. *Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.*

Existing land use of the site consists primarily of a mixture of recreational use from the existing resort and wooded land. The resort has been in operation since 1919 and currently consists of a lodge, bar/restaurant, cabins, motel, and RV/tent camp sites. Many of the existing structures are rundown and in need of repair or replacement. Some mineral extraction has historically taken place on the site with these areas now consisting of bare earth or sparsely vegetated land.

Surrounding land use includes residential, recreational, and wooded land. White Iron Lake and Farm Lake are located abutting the site to the east. Additional recreational land use off these lakes includes the adjacent Pine Pointe Lodge and North Country Canoe Outfitters. Additionally, numerous wooded lakefront residential lots are located off these lakes in the surrounding area. Land to the northwest of the site consists of large, wooded lots. To the west is a mineral extraction site. To the southwest is predominantly residential lots. The Boundary Waters Canoe Area (BWCA) is located approximately 2.25 miles to the east of the Project site.

Existing land cover on site can be seen in **Appendix A – Figure 4**.

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

Lake County Comprehensive Plan and Land Use Ordinance (June 23, 2017)

The Lake County Comprehensive Plan, hereafter referred to as the Plan, established land use districts for Lake County. The project site falls within the Residential-Recreational (RR) land use district. The defined purpose of the RR district within the Plan is as follows:

“This district provides for residential development and essential recreation-oriented services in areas of high recreational value where soil conditions and other physical features will support such development without depleting or destroying natural resources.”

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

The Project Area is currently under Lake County planning and zoning jurisdiction. Zoning districts within Lake County are synonymous with the land use districts described in the previous section. Therefore, the project site is zoned Residential-Recreational. Additionally, a portion of the project site falls within the Shoreland Overlay District. An exported map from the Lake County Atlas displaying the zoning of the project site is included in **Appendix C**.

There are no areas of wild and scenic river segments, critical areas, agricultural preserves, or airport safety zones located within or adjacent to the project site. At this time FEMA has not mapped floodplains within Lake County.

- 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.*

The are no critical facilities currently located within the Project site or proposed to be constructed as part of the project.

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

A compatibility issue between the project and zoning is that resorts are not a permitted use under Residential-Recreational zoning. However, as the site currently consists of an existing resort, there will be no land use change. There were no other compatibility conflicts identified between the proposed project and nearby land uses, zoning or any local or regional plans.

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

The proposer will work with Lake County to either amend its existing Conditional Use Permit (CUP) allowing the site to be used as a resort or secure a new CUP to ensure that the resort expansion meets local requirements.

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 Minnesota Geological Survey indicates that bedrock within the Project Area consists of Upper Ely Greenstone bedrock which generally consists of volcanic rock. Bedrock within the project site's region is typically exposed at the surface or buried at shallow depths by shallow surficial soils. The mapped surficial geology at the project was rainy lobe – vermillion moraine.

A geotechnical evaluation of the site has been completed by Northeast Technical Services. This work included 19 soil borings which were conducted across the site. Borings were taken to a depth of 15' below the surface unless refusals such as bedrock were encountered. Refusals occurred at 11 of the borings between the depths of 3 and 11.5 feet. The most common refusal depth encountered was 8' suggesting this was the typical depth to bedrock on site. A copy of the geotechnical report is included within **Appendix D**.

There are no known or mapped sinkholes, shallow limestone formation, unconfined/shallow aquifers, or karst features identified within or near the project area.

Bedrock geology and karst features are illustrated on **Appendix A – Figure 6**.

- b. *Soils and topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.*

The NRCS Web Soil Survey was reviewed for mapped soil unit characteristics within the Project Area. Soil characteristics and attributes are provided in the following **Table 11-1** and illustrated on **Appendix A – Figure 7**.

Table 11-1. Soil Characteristics within Project Area

Soil Symbol	Soil Unit Name	Acres	HEL *	Hydrologic Group**	Hydric Rating***	Farmland Classification
F24A	Gnesen loam, 0 to 3 percent slopes	1.5	NHEL	A/D	Predominately Non-Hydric	Farmland of statewide importance
F40D	Rollins cobbly sandy loam, 8 to 18 percent slopes	21.7	HEL	A	Non-Hydric	Not prime farmland
J1a40A	Greenwood-Greenwood ponded complex, 0 to 1 percent slopes, dense substratum	4.0	NHEL	A/D	Hydric	Not prime farmland
K1-10	Pits, gravel-Udipsamments complex	32.9	PHEL	-	Non-Hydric	Not prime farmland
W	Water	0.1	NHEL	-	Non-Hydric	Not prime farmland

Legend:

*Highly Erodible Land

HEL: Highly Erodible Land

PHEL: Potentially Highly Erodible Land

NHEL: Not Highly Erodible Land

**Infiltration Rate

A: >0.30 inches/hour

B: 0.15-0.30 inches/hour

C: 0.05-0.15 inches/hour

D: <0.05 inches/hour

***Hydric Rating

Hydric: 100%

Predominately Hydric: >67% and <100%

Partially Hydric: >33% and <67%

Predominately Non-Hydric: <1% and <33%

Not Hydric: 0% hydric

Soils observed within the soil borings of the site's geotechnical evaluation consisted of different compositions of sand such as poorly graded sand or silty sand with gravel. Recommendations provided within the report for design and consideration have been taken into account in the project design.

Construction activities will temporarily expose soils to an increased risk of erosion from wind and precipitation. Appropriate erosion and sediment control best management practices (BMPs) will be selected and defined by a Stormwater Pollution Prevention Plan (SWPPP). BMP selections will be based on the potential risk of erosion, current site conditions, and maintenance through the duration of each construction phase to reduce the potential of sedimentation occurring to surface water resources or migrating offsite. Temporary BMPs will be inspected and maintained (per the NPDES Construction Stormwater Permit) until permanent vegetation and stabilization has occurred. Permanent BMPs will be incorporated into each individual project design and Stormwater Pollution Prevention Plan (SWPPP) to minimize post-construction erosion and sedimentation.

Topography of the Project Area, collected via LiDAR in 2020 and published publicly by the U.S. Geological Survey (USGS), is illustrated on **Appendix A – Figure 8**. Site elevations were shown ranging from 1,388 to 1,504 msl. Site topography generally slopes east towards White Iron and Farm lakes. Three areas of steep slopes, or bluffs, are located within the site. No earthwork will occur within these bluff areas and no structures will be placed within the 30' top of bluff setbacks required by Lake County ordinance.

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, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current

MPCA 303d Impaired Waters List that are within 1 mile of the project. Include MDNR Public Waters Inventory number(s), if any.

Surface water resources within the Project site itself include 3 wetland areas totaling 6.4 acres. These were delineated by GEI Consultants in 2023. A copy of the Wetland Delineation Report is included in **Appendix E**. Two lakes are present directly abutting the western boundary of the site. These are Farm Lake and White Iron Lake which are Public Waters Basins. Both lakes are listed as Section 303d impaired waters for aquatic consumption due to Mercury in fish tissue (Hg-F). Additionally, the Kawishiwi River is mapped as flowing through these lakes. The Kawishiwi River is a Public Waters Watercourse. These water features are illustrated on **Appendix A – Figure 9a**.

There are no DNR Public Waters Watercourses, lakes, designated wildlife lakes, migratory waterfowl feeding/resting areas, trout streams/lakes, MPCA or MDNR listed calcareous fens, outstanding resource value waters, or county or jurisdictional ditches within the Project site.

Prominent water features located within 1 mile of the Project Area include two additional Public Waters. These are Garden Lake, located approximately 0.55 miles north of the Project site and Section Thirty Creek, located approximately 0.84 miles to the west. Garden Lake is listed as Section 303d impaired waters for aquatic consumption due to Mercury in fish tissue (Hg-F). These water features are illustrated on **Appendix A – Figure 9b** and listed in **Table 12-1**. The boundary waters, a outstanding resource value water, is located approximately 2.25 miles to the east.

Table 12-1. Water Bodies Within 1-Mile of the Project Area

Waterbody Name	PWI Label	PWI Number	Distance	Shoreland Classification	Impairments
Farm Lake	Public Water Basin	38077900	Adjoining	Recreational Development	Hg-F
White Iron Lake	Public Water Basin	69000400	Adjoining	Recreational Development	Hg-F
Kawishiwi River	Public Water Watercourse	H-001-092	Adjoining	None	None
Garden Lake	Public Water Basin	38078200	0.55 Mi N	Recreational Development	Hg-F
Section Thirty Creek	Public Water Watercourse	H-001-092-004-001	0.84 Mi W	None	None

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 onsite or nearby, explain the methodology used to determine this.*

- 1) The Water-Table Elevation dataset from the Minnesota Hydrogeology Atlas lists the water table across the project site as >1,380-1,400. Groundwater was observed in two of the soil boring during the geotechnical evaluation. These were observed at elevations 1,426.15' and 1,426.60'. Assuming an approximate groundwater elevation of 1,426' for the whole site, depth to groundwater would range from approximately 0-80 feet across the site.
- 2) The project site is not located within a wellhead protection area (WHPA). The closest WHPA to the site is the Winton WHPA located approximately 2.35 miles to the northwest.
- 3) According to the Minnesota Department of Health – Minnesota Well Index, there is one well located within the project site. This is the source well for the Silver Rapids Lodge Public Water Supply System (PWS). A copy of the Well Log Report is included in **Appendix F**. Wells located within the Project area are listed in **Table 12-2** below.

Table 12-2. MDH Minnesota Well Index within the Project Area

Unique ID	Name	Well Type	Status
260280	Well 1	Public Water Supply	Active

Groundwater resources located within and surrounding the Project Area are illustrated on **Appendix A – Figure 10**.

- 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.*

N/A

- 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.*

A detailed memorandum covering onsite wastewater treatment and dispersal design is included in **Appendix G**. Silver Rapids Lodge will be served by three mid-sized sewage treatment systems (MSTS > 5,000-to-10,000 gallons per day, gpd) and an existing individual sewage treatment system (ISTS ≤ 2,500 gpd). Designed sanitary flows are included in **Table 12-3**. Four septic tank effluent (STE) treatment and dispersal sites have been identified and evaluated for use. These sites, as well as additional sites that were not chosen, are depicted in the Preliminary SSTS Site Plan in **Appendix F**.

Table 12-3. Designed Sewage Treatment Flows

System	Flow
24-Southwestern Cabin Group	9,600 gpd
Lodge Group (lodge, beach sanitation building, fish-cleaning building, motel, and 5 existing cabins)	9,210 gpd
20-East-Central Cabin Group	8,000 gpd
Retreat Cabin	600 gpd
Total	27,410 gpd

SSTS features including existing infrastructure and planned dispersal sites are illustrated on **Appendix A – Figure 11**.

- 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.*

N/A

- ii. *Stormwater – Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.*

The quality of existing stormwater runoff from the project is typical of wooded land. Stormwater runoff flows from upland areas to lower elevations on site as sheet flow where it generally gets conveyed into Farm or White Iron lakes.

Temporary erosion and sediment control best management practices (BMPs) will be installed, maintained/repared, and amended throughout construction as required to remain compliant with the current NPDES Construction Stormwater Permit requirements at the time of permit coverage. SWPPP development and NPDES Construction Stormwater Permit coverage will occur per phase of plat, per buildable lot, in phases of multiple lots, or by individual parcels as development progresses throughout the Project Area. Temporary BMPs may include (but are not limited to) silt fence, bio-rolls/filter logs, rock construction entrances, mulch/hydro mulch, and permanent native seeding or turf seeding in appropriate areas.

The project's co-permittees (primary contractor and owner) will be jointly responsible for all SWPPP components. The primary contractor will be responsible for all SWPPP components during active construction which includes amending the SWPPP as necessary, installation, maintenance, and repair of all temporary erosion and sediment control BMPs.

The quality of stormwater runoff from the project post-construction is anticipated to decrease due to the increase in impervious surfacing. Impervious surfaces and lawn/landscaping generally generate higher concentrations of total suspended solids and total phosphorus. To help mitigate potential impacts, this stormwater runoff from the lodge and parking lots is proposed to be conveyed into subsurface stormwater infrastructure designed to store and treat stormwater.

- 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 MDNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.*

The existing resort is currently serviced by the Silver Rapids Lodge PWS (#5380061). A Preliminary Groundwater Feasibility Assessment of the project was conducted by SD Consulting Group. A copy of the report is included in **Appendix F**. The estimated water demand in gallons per day (GPD) from that assessment is depicted in **Table 12-4**.

Table 12-4. Estimated Potable Water Demand

Structure	# of Units	Persons/ Unit	Demand/Person (GPD)	Peak Water Demand (GPD)
Cabin	51	4.5	50	11,475
Restaurant	100 seats		30	3,000
Employees	30		8	540
Hot Tub Fill ¹	1		350	350
Fish Shack	1		50	50
Motel	6	2	38	456
Peak Daily Demand				15,871 gpd
Average Daily Demand				7,936 gpd

1. Assumes one hot tub is filled daily.

Water supply features are illustrated on **Appendix A – Figure 12**.

iv. **Surface Waters**

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

The project site was delineated by GEI Consultants in 2023. 3 wetland areas totaling 6.4 acres were delineated on site. This included areas of alder thicket, hardwood swamp, and shallow marsh wetland plant communities. Wetland impacts were minimized to the extent feasible during project design. This included avoiding all impacts to the higher quality and natural alder thicket and hardwood swamp wetlands. Wetland impacts as a result of roadway grading, ultimately were limited to 216 square feet within the shallow marsh wetland. This wetland was identified within the delineation report as likely being an incidental, or man-made, wetland resulting from the gravel extraction that took place on that portion of the project site.

These wetland impacts would not require mitigation under MN Statute 103G.2241 Subdivisions 5 and 9. Under subdivision 5 mitigation is not required for impacts to incidental wetlands and under subdivision 9 mitigation is not required for impacts in this area of the state for impacts under one-quarter acre. Therefore, no wetland mitigation is proposed for this project.

- 2) *Other surface waters – Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.*

No direct impacts to either Farm or White Iron lakes are proposed. However, the replacement of existing docks as well as the additions of new ones on both lakes are proposed as part of the project. Existing docks at the resort include 14 mooring docks and 2 docks at the existing boat launch. The project proposes 26 mooring docks and 1 dock at the launch. Each mooring dock accommodates two mooring sites. This increases the total resort mooring sites from 28 to 52. This increase is intended to accommodate space for restaurant patrons.

Buffers of 25 feet were applied to the existing and proposed docks to determine the Habitat Impact Zones (HIZs) of the existing and proposed docks. The HIZ is the space surrounding docks where the loss of aquatic plants and fish/wildlife habitat can be anticipated. Ultimately, the proposed HIZ area for the littoral zones of both lakes was minuscule (<0.02%) and is not anticipated to result in long-term impact to either lake. A breakdown of existing and proposed docks, mooring spaces, and HIZs is included in **Table 12-5**.

Table 12-5. Dock/Mooring Spaces and Habitat Impact Zones

	Farm Lake	White Iron Lake	Total
Existing Docks (Including Launch)	10	5	15
Proposed Docks (Including Launch)	21	6	27
Net Change	+11	+1	+12
Existing Mooring Spaces	20	8	28
Proposed Mooring Spaces	42	10	52
Net Change	+22	+2	+24
Existing Habitat Impact Zone Area (SF)	30,105	11,582	41,687
Proposed Habitat Impact Zone Area (SF)	47,316	10,594	57,910
Net Change (SF)	+17,211	-988	+16,223
Lake Littoral Area (Ac)	459	1,603	2,062
Existing Habitat Impact Zone as Percent of Littoral Area	0.151%	0.017%	0.046%
Proposed Habitat Impact Zone as Percent of Littoral Area	0.237%	0.015%	0.064%
Net Change (SF)	+0.086%	-0.002%	+0.018%

No other surface water features (lakes, streams, intermittent channels, or county/jurisdictional ditches) will be physically or indirectly altered during the construction or operation of the proposed project.

Temporary erosion and sediment control best management practices (BMPs) will initially be installed (per the project's SWPPP), maintained/repared, and amended throughout the construction phases to avoid indirect impacts to water resources. BMPs may include (but are not limited to) silt fence, bio-rolls/filter logs, rock construction entrances, mulch/hydro mulch, and permanent native seeding or turf seeding in appropriate areas. Following construction, permanent constructed stormwater treatment infrastructure will help protect and provide storage and treatment to waters prior to discharging into water resources.

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.*

Minnesota Pollution Control Agency (MPCA) records indicate both historic and existing contamination at the project site. The What's In My Neighborhood (WIMN) database indicates two leaking storage tank incidents on the project site. The first of which, known as LS0020370, was discovered on April 22, 2017. This incident consisted of the release of an unknown amount of fuel oil that was detected following the removal of an underground storage tank (UST). LS0020370 was issued regulatory site closure by the MPCA on October 17, 2018, indicating it was addressed to the satisfaction of the MPCA and did not pose a threat to human health or the environment at that time. The second release, LS0022243, was discovered on October 1, 2021, during a limited environmental investigation. This incident consisted of the release of an unknown amount of gasoline. LS0022243 has not yet received regulatory site closure. Contaminated soil cleanup is ongoing and will be completed as part of the resort renovation efforts.

In addition to the leaking storage tank listings, the site has two entries within the MPCA Brownfields Program database. These entries resulted from the property being entered into the Voluntary Investigation and Cleanup (VIC) program from lenders seeking No Association Determination letters from the MPCA. The first brownfields listing, BF0002046, was opened on December 13, 2021. BF0002046 was issued regulatory site closure on January 20, 2022, along with the issuance of a No Association Determination letter. The second listing, BF0002139, was opened on March 3, 2022. BF0002139 has not yet received regulatory site closure.

The limited environmental investigation mentioned above detected Tetrachloroethene (PCE) in groundwater as well as petroleum in soil samples at levels under the threshold requiring the oversight of the MPCA. The PCE was detected in groundwater at a concentration less than the Health Risk Limit (HRL) established by the Minnesota Department of Health (MDH). Although the PCE was under the HRL, it is still at a level that has kept LS0022243 and BF0002139 from receiving regulatory site closure.

The Proposer is actively working with the MPCA to address the PCE contamination. Most recently this included performing limited site investigations (LSIs) on February 4, 2026, which included soil borings, a vapor survey, and receptor survey and on May 18, 2026, which included additional soil borings in areas which were not safely accessible during the February 4 investigation. The Proposer will continue to work with the MPCA to mitigate the PCE contamination and receive all regulatory site closures.

MPCA WIMN documentation is included in **Appendix H** and additional WIMN sites within proximity of the project area are illustrated on **Appendix A – Figure 13**.

If any other potentially contaminated materials (or other environmental hazards) are discovered during construction activities, the project proposer/contractor will immediately cease activities in the area, then take appropriate and reasonable actions to contain and reduce the human health and/or environmental risk prior to contacting the State of Minnesota Duty Officer, Lake County, and project proposer's representative. The development of a Contingency Plan or Response Action Plan will be initiated if analytical results characterize the discovered materials qualify as a regulated contaminated waste.

- 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.*

Solid and liquid wastes generated from construction materials and equipment are expected in minimal amounts during periods of active construction. Wastes may include scrap wood, packaging, excess building materials, and sediment laden construction dewatering. The contractor will be required to immediately haul offsite and/or temporarily store and dispose of (or recycle) all waste in accordance with MPCA regulations and the NPDES Construction Stormwater Permit. Construction products will be kept in their manufactured containers and secured prior to the end of each work day.

Operational non-hazardous waste will be temporarily stored onsite (via commercial dumpsters) and disposed of offsite by a waste hauler.

- c. *Project related use/storage of hazardous materials – Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.*

Hazardous materials (portable fuel tanks and lubricants) may be used for equipment operations during construction and temporarily placed onsite in sealed containers (at all times) and under secured restricted access during non-working hours. These materials will only be used during active construction for refueling and maintenance of construction equipment. To ensure that potential fuel spills do not contaminate surface and ground waters, construction and maintenance activities would occur at reasonable distances from surface waters and steep sloped areas. The contractor will be required to abide by the Pollution Prevention Management Measures (Part IV.F.2) of the NPDES Construction Stormwater Permit. All hazardous materials will be removed from the Project site upon completion of construction.

- 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.*

Hazardous waste storage and disposal associated with construction activities will comply with the NPDES Storm Water Pollution Prevention Plan during periods of construction. Following construction, the development is not anticipated to generate significant volumes of hazardous wastes.

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.*

Ecological land units for the project area have been mapped and defined in the Ecological Classification System (ECS), which has been adopted by the Minnesota DNR. The project location occurs in the Border Lakes subsection (212La). The primary land uses listed for this subsection are forestry as well as recreation/tourist. The project site itself consists of an existing resort and wooded land. Two lakes, Farm and White Iron, are located immediately adjacent to the project site.

- b. *Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (MCE-____) 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.*

An official NHIS Review of the project has been ordered (MCE # 2026-00177). No state-listed endangered or threatened species have been documented in the vicinity of the project. One state-listed species of special concern was documented in the vicinity of the project area. This was the northern sunfish. A copy of the review letter is included within **Appendix I**.

A U.S. Fish & Wildlife Service Official Species List for the Project site, generated from the Information for Planning and Consultation (IPaC) documented six federally listed threatened species. This included the following: Canada lynx (Threatened), gray wolf (Threatened), northern long-eared bat (Endangered), tricolored bat (Proposed Endangered), monarch butterfly (Proposed Threatened), and the Suckley's cuckoo bumble bee. There were two final critical habitats mapped within the project site. These were for the listed species of the Canada lynx and gray wolf. The U.S. Fish & Wildlife Service Official Species List is included within **Appendix I**.

The entirety of the Project site is located within a Minnesota Biological Survey (MBS) Site of Biodiversity Significance. This is the Fernberg Cedar Corridor MBS site which has a biodiversity significance rank of Below. There were two additional MBS sites adjoining the project site. This included the Kawishiwi Triangle site to the east with a rank of High and the South Kawishiwi River site to the south with a rank of Moderate. There were no mapped DNR native plant communities located within the Project site.

MBS sites and Native Plant Communities are illustrated on **Appendix A – Figure 14**.

- c. *Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.*

Fisheries lake survey reports for Farm and White Iron lakes available on DNR Lakefinder were reviewed for the confirmed samplings of the northern sunfish in either lake. 11 surveys were available for Farm Lake spanning from 1983 through 2023 and 17 for White Iron Lake spanning from 1982 through 2023. There were no sampled northern sunfish within either lake across the 28 surveys spanning over 40 years. As a result, the northern sunfish is not believed to be located within Farm or White Iron lakes and no impacts on the species are anticipated.

IPaC determination keys were completed to evaluate impacts to the federally listed species. “May Affect” determinations were received for the Canada lynx and gray wolf as well as their critical habitats. Given the existing recreational land use of the project site as well as the surrounding area land use such as mineral extraction, additional recreational use, and residential use, these species are not anticipated to be located within the Project area. Therefore, adverse impacts to these two species are not anticipated. “May Affect Not Likely to Adversely Affect” determinations were received for the northern long-eared bat and tricolored bat and a “No Effect” determination was received for the monarch butterfly. The IPaC Technical Assistance Letters are included in **Appendix I**.

The Suckley's Cuckoo Bumble Bee was not covered by any determination key. The habitat of the bee includes prairies, grasslands, meadows, woodlands, agricultural areas, and urban areas. Due to the Project site containing woodland it was determined that the project could potentially effect the Suckley's Cuckoo Bumble Bee, however, considering the surrounding area contains sufficient similar habitat, significant negative effects on the species are not anticipated.

Measures to prevent the spread of invasive species during construction include working in non-infested areas first before moving to infested areas, thoroughly cleaning equipment after working in infested areas and before mobilizing to a different portion of the project site or a different project and revegetating disturbed areas as soon as possible after construction is completed in an area.

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

Recommendations and requirements provided by the DNR within the NHIS review letter will be implemented into the project limiting tree removals between June 1 and August 15.

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.

No impacts to any known historic structures, archeological sites, and/or traditional cultural properties are anticipated to occur as part of the project. The following resources were reviewed.

MN State Historical Preservation Office (SHPO): A review of SHPO's Minnesota Statewide Historic Inventory Portal (MnSHIP) database was conducted. No known historic features were mapped within the Project site. The adjacent Bridge 38505 was mapped as inventoried and given a status of “Not Eligible for NRHP”. No impacts to this structure will take place as part of the project.

This EAW will be filed with the Minnesota Environmental Quality Board (MEQB) and circulated to the required MEQB distribution list, which includes SHPO, for review and comment. Any comments received from SHPO would be disclosed in the project's Findings of Fact and Conclusions document.

MN Office of the State Archeologist (OSA): A review of publicly available data from the OSA Portal was conducted. A small portion of the existing resort at the eastern extent of the project site overlapped with two areas mapped within OSA Site Summary layer. Both areas had a site count of one.

This EAW will be filed with the Minnesota Environmental Quality Board (MEQB) and circulated to the required MEQB distribution list, which includes the OSA, for review and comment. Any comments received from the OSA would be disclosed in the project's Findings of Fact and Conclusions document.

National Register of Historic Places (NRHP): A review of publicly available data from the NRHP database was conducted. No known historic or archaeological features mapped within, or in the vicinity of, the Project site.

Cultural Resources from the MnSHIP, NRHP, and OSA databases are illustrated on **Appendix A – Figure 14**.

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.

Existing scenic views located near the project site include the adjacent White Iron and Farm lakes. Development of the Project will not impact the lakes or create new obstructions of the view of the lake from the adjacent roads or properties. Additional views of the lakes will become available for the guests of the resort.

The completed Project will not create any significant visual nuisances such as intense light pollution or vapor plumes.

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, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used 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 is not anticipated to result in any temporary or permanent stationary sources of air emissions. There are no existing permitted air facilities or sensitive receptors within the vicinity of the proposed Project.

- 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 will result in a small increase in local traffic. This will result in a small increase in local vehicle air emissions.

- c. *Dust and odors – Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.*

Dust common to construction and earth moving activities is expected (in the form of fugitive dust) during periods of dry weather. Dust will be visually monitored and recorded in conjunction with the NPDES Construction Stormwater Permit. Appropriate dust control best management practices (such as soil wetting, misting/water vapor, and hydraulic additives) may be implemented (upon inspection or public complaint) by the contractor as necessary to control dust from leaving each construction site during all phases of construction. Specific dust control best management practices will be determined and implemented (as necessary) based on severity, weather conditions (i.e. wind speed), and current site conditions.

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.*

Two phases of the project need to be quantified, the construction phase and the operation phase. Greenhouse gases (GHGs) commonly include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), fluorinated gases (chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃)). There are three types of emissions: Scope 1, 2, and 3. All estimated/projected GHG emissions are provided on an average lifetime (50-year) annualized basis using the CO₂ equivalent (CO₂eq).

Construction Emissions:

GHGs emitted during the construction phase are primarily from mobile equipment (passenger cars, trucks, and construction equipment). A high level and conservative estimate of construction emissions was developed using reasonable assumptions for anticipated construction equipment usage associated with demolition, grading, utility installation, roadwork, foundation work, vertical construction, and site improvements for a phased resort redevelopment project of this scale. **Table 18-1** lists the assumed construction equipment to be used as well as their quantities and durations of use. Utilizing these assumptions an estimate of approximately 5,000–8,000 metric tons CO₂e for construction emissions was calculated. Construction emissions were divided by the project timeline (50 years) to get annualized emissions.

Table 18-1. Estimated Construction Emissions

Equipment Type	Estimated Quantity	Estimated Average Duration	Typical Fuel Type
Excavators (mid-large)	2-3	8-12 Months Intermittent	Diesel
Bulldozers	1-2	4-6 Months Intermittent	Diesel
Wheel Loaders	1-2	8-10 Months Intermittent	Diesel
Skid Steers	2-4	Throughout Construction	Diesel
Dump Trucks	4-8 Rotating	Intermittent Hauling Periods	Diesel
Concrete Trucks	Variable	Foundational Phases	Diesel
Cranes	1	Vertical Construction Periods	Diesel
Forklifts/ Telehandlers	2-3	Building Construction Phases	Diesel
Generators/ Compressors	Various Temporary	Intermittent	Diesel/Gasoline
Pickup Trucks/Light Duty Vehicles	Variable	Throughout Construction	Diesel/Gasoline
Estimated Total Construction Emissions		5,000–8,000 metric tons CO₂e	

Operation Emissions:*Mobile Sources*

Up to 425 trips per day are estimated to be generated by the project. An average increase of up to 100 people per day is anticipated. To estimate traffic emissions, it was assumed that this was 213 unique passenger vehicles, up 50 from existing numbers. It was assumed that each vehicle travels 33 miles per day. The fuel efficiency of said vehicles was estimated at 25 miles per gallon (based on the average for model year 2015 and 2020 to incorporate varying vehicle ages). It was also assumed employees/patrons drive gasoline-powered, light duty vehicles.

Off-site Electricity Production

Emissions from electricity production offsite were based on the U.S. EPA's Emission Factors for GHG Inventories based on the upper Midwest (MRO West) Emissions and Generation Resource Integrated Database (eGRID) subregion. Estimated monthly energy usage, based on existing usage and factoring the added units and higher occupancy, is anticipated to be 65,000 to 75,000 kWh per month. This is an increase of approximately 25,000 kWh per month.

Off-site Waste Management

Estimated waste generation, based on existing usage and factoring the added units and higher occupancy, is anticipated to be 550 to 650 pounds per day including recyclable trash.

GHG calculations were conducted using the ISG Greenhouse Gas Emissions Calculator (ISGHG). The ISGHG is similar to the EPA's Simplified GHG Emissions Calculator (SGEC) and is based on the Revised Environmental Assessment Worksheet Guidance (EQB, 2022). Refer to **Appendix J** for Operations GHG calculations.

Table 18-2. Estimated Operational Emissions

Scope	Type of Emission	Emission Sub-type	Existing facility CO2e Emissions (tons/year)	Project-related CO2e Emissions (tons/year)	Total CO2e Emissions (tons/year)	Calculation method(s)
Scope 1	Combustion	Mobile Equipment	721.97	221.46	943.43	ISGHG
Scope 1	Combustion	Stationary Equipment	0	0	0	N/A
Scope 1	Combustion	Area	0	0	0	N/A
Scope 1	Non-Combustion	Stationary Equipment	0	0	0	N/A
Scope 1	Land Use	Carbon Sink	0	0	0	N/A
Scope 2	Off-Site Electricity	Grid-Based	295.91	147.96	443.87	ISGHG
Scope 2	Off-Site Steam Production	Not Applicable	0	0	0	N/A
Scope 3	Off-Site Waste Management	Area	45.86	22.14	68.00	ISGHG
TOTAL			1,063.74	391.56	1455.30	ISGHG

b. *GHG Assessment:*

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

Due to the minimal emissions that will result from the project (<25,000 TPY CO2e Emitted annually) no mitigation measures were deemed necessary. However, tree plantings will be a part of the project which will provide carbon sequestration.

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

N/A

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*

Utilizing ISGHG the projected annual CO2e emissions from the operation of the project was approximately 1615.3 tons/year (1455.3 operations and 160.0 construction annualized). With a projected project life of 50 years the net CO2e emissions are 80,765 tons. Emissions from continued operations without the project were projected to be 63,824.4 tons over the same period for a net increase of 19,578 tons. This represents a very small amount when compared to state-wide GHG emissions and would have minimal effect on the State of Minnesota's or the local area's GHG reduction goals.

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.

- 1) Existing noise in the Project area includes vehicle traffic from adjacent roads and recreational activities from the existing resort.
- 2) Sensitive receptors located within proximity to the project site include nearby residential homes.
- 3) Exterior noise while construction is taking place may range from 65-95 dBA. Post-construction exterior noise is anticipated to be generated from intermittent traffic and recreational activities similar to existing conditions. All exterior noise is expected to be less than the State of Minnesota noise rules in a residential land use setting (<65 dBA daytime & <55 dBA nighttime).
- 4) Nearby residential homes may experience a temporary increase in noise duration and frequency during construction; however, these noises will be conducted during restricted hours. Post construction noise will be typical of surrounding residential areas and will not exceed the State of Minnesota statutory limits for residential receptors (NAC 1), Minnesota Rules 7030.0040, therefore, any noise anticipated from standard operations and construction activities will not result in a decreased quality of life.

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.*

- 1) Although the site currently has areas of paved and gravel surfaces available for parking, there is only striping for designated parking spaces along the southern face of the existing lodge building. This consists of 4 parking spaces including 1 handicap space.

The proposed project will establish designated and paved parking throughout the site. This will include parking spaces for cabins, the motel, lodge, as well as overflow parking. A total of 253 parking spaces are proposed. This includes 22 trailer parking spaces as well 4 handicapped spaces for the lodge.

- 2) Estimated average daily traffic to the site is anticipated to be approximately 350 to 425 vehicle trips per day.
- 3) The project is estimated to generate 40-60 vehicle trips at peak hour of adjacent street traffic.
- 4) Traffic estimates are based upon a combination of historical resort operations, anticipated occupancy levels, comparable regional resort activity, and professional judgment regarding seasonal traffic patterns in northern Minnesota recreational markets.
- 5) Alternative methods of transportation include ride sharing services, public transportation, and adjacent trails. Public transportation is available from Arrowhead Transit. Connections to adjacent trails will provide opportunities for walking or biking.

- 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.*

The project is not anticipated to significantly increase traffic congestion or result in needed improvements to the local roadway system. The minimal traffic generated during construction and regular operational use is not expected to exceed 250 vehicles or total more than 2,500 trips per day.

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

Temporary traffic disruptions are not anticipated or planned for this project during or after construction. If disruptions to local public roads are needed, proper traffic control measures will be implemented as specified in the Minnesota Manual of Uniform Traffic Control Devices (MMUTCD). There are no identified long-term traffic minimization plans associated with project operations.

A new signalized pedestrian crosswalk system has been incorporated into the project design mitigate concerns of resort patrons crossing CSAH 16 between the boat launch/beach and the resort restaurant.

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.*

Pending project approvals, site preparation work is anticipated to begin as soon as fall 2026. Site construction is anticipated to take place over at least 12 months. The proposed Project's long-term operations are not anticipated to contribute to any additional environmental effects resulting in cumulative potential 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.*

There are no known reasonably foreseeable future projects that may interact with environmental effects of the proposed project.

- 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.*

Environmental impacts to habitat, air, and water resources resulting from the proposed development or other potential developments in the project vicinity will be mitigated or minimized through implemented engineering controls as required by current and applicable regulatory programs (refer to **Table 9-1** Permits and Approvals).

In addition to the potential environmental impacts addressed by items 1 to 20, the economic, employment, and sociological impacts of the project were considered. The economic and social impacts of the project on the local community are anticipated to be beneficial by bringing additional recreational and employment opportunities during construction and continued operations of the resort.

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

There are no other known or potential environmental effects that were not discussed in items 1 to 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 

Date 6/29/2026

Title Director, Lake County Environmental Services

Appendix A – GIS Figures

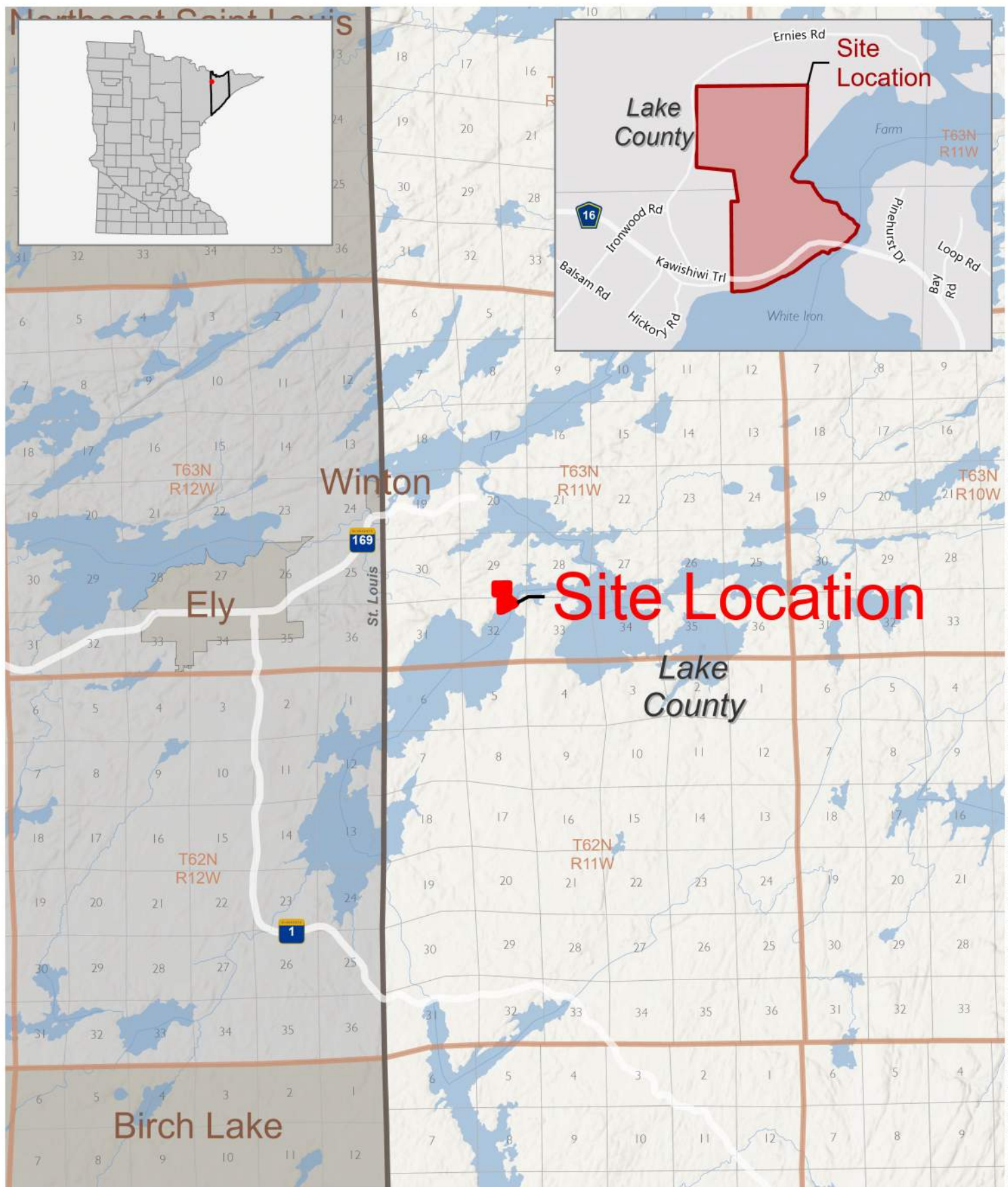


Figure 1
Project Location Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

Source(s):
 Municipalities (MnDOT, 2026)
 Roads (MnDOT, 2026)
 PWI (MnNR, 2026)
 Counties (MnDNR, 2026)
 PLSS (MnGeo, 2026)



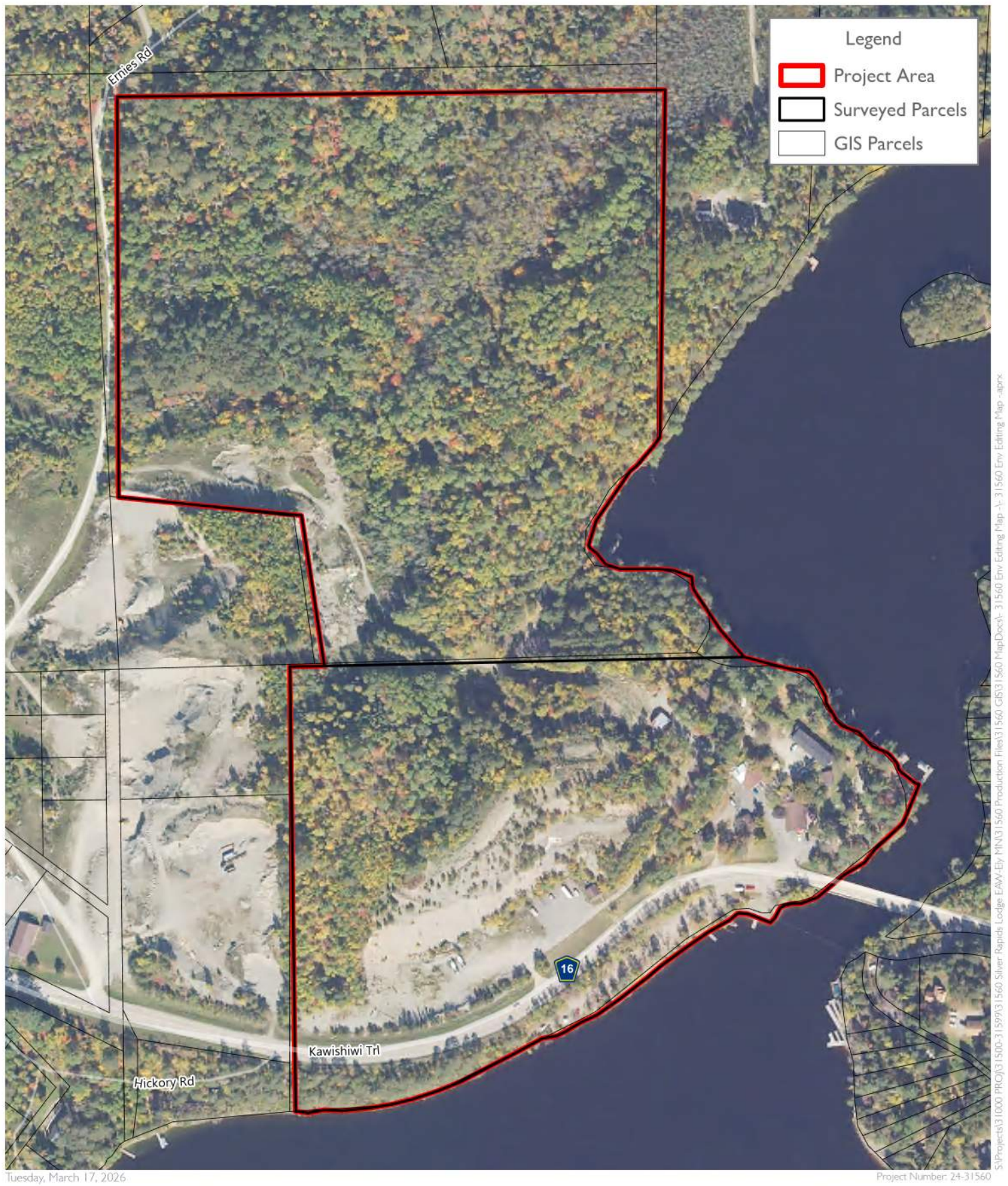
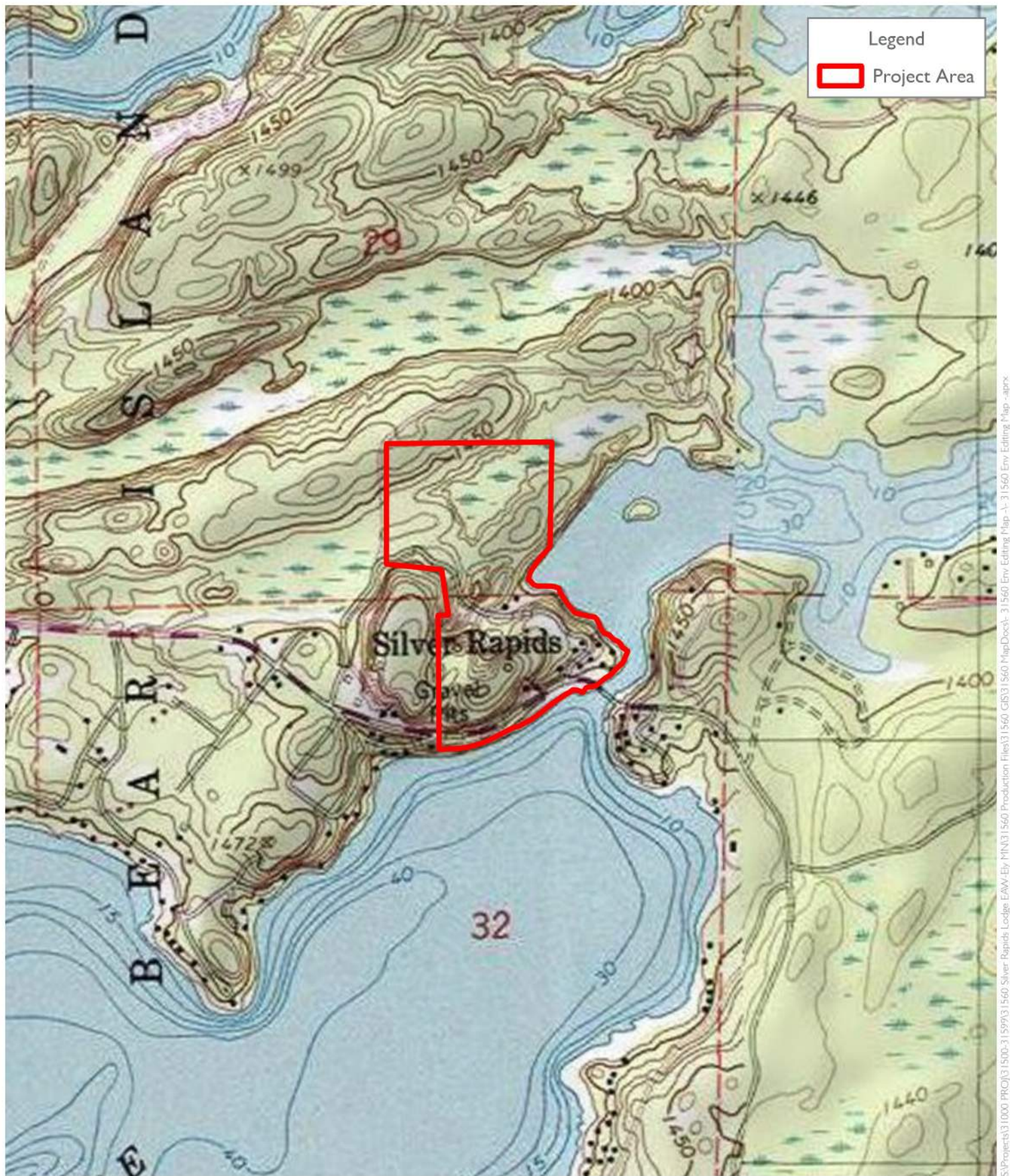


Figure 2
 Aerial Photograph
 and Parcel Map
 Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota



Monday, March 9, 2026

Project Number: 24-31560

0 500 1,000
ft
1 inch = 1,000 feet



Figure 3
USGS Topographic Map
Silver Rapids Lodge
Fall Lake Twp, Lake County, Minnesota

Source(s):
24k USGS Quads (USA Topo Maps)

ISG

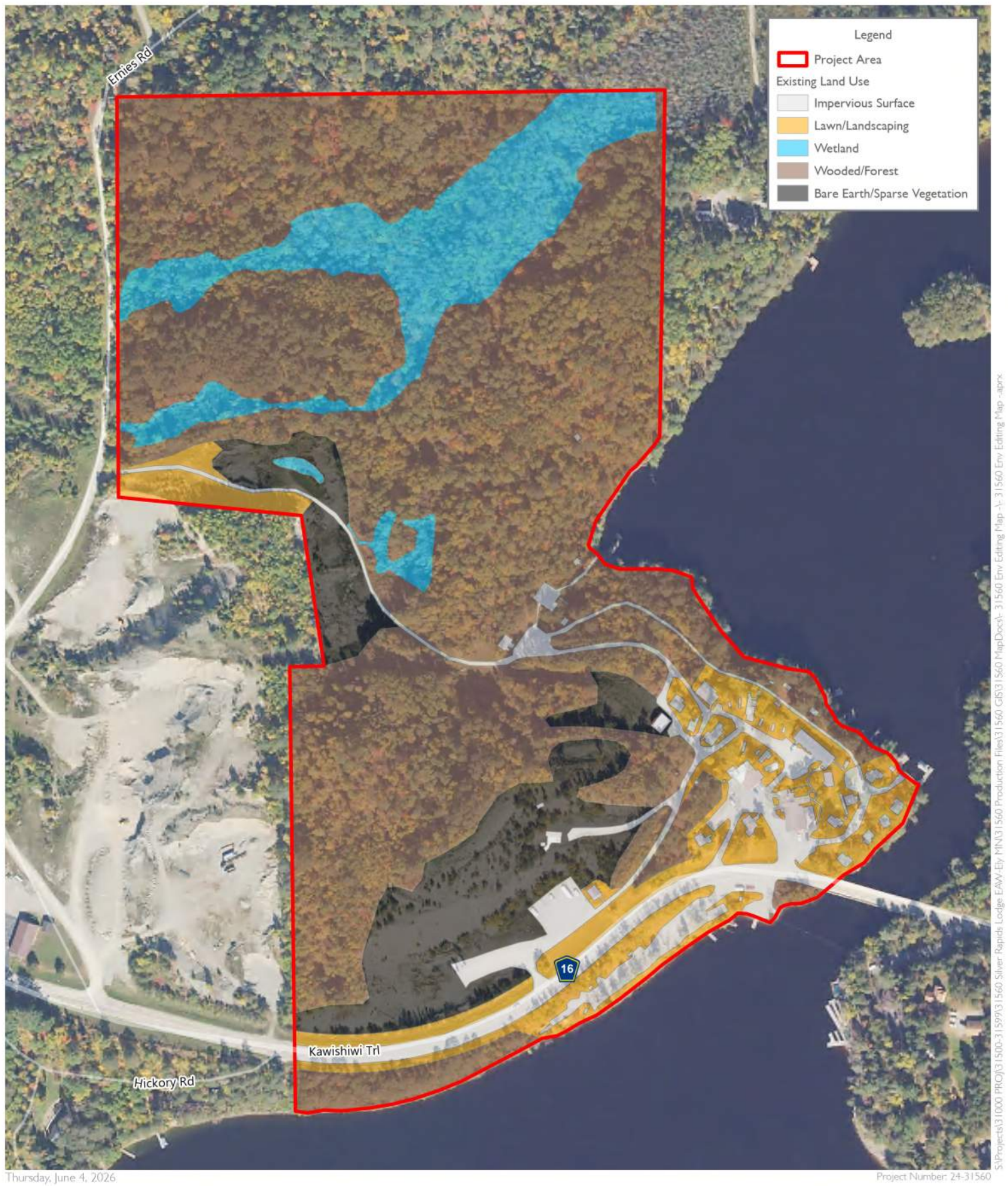
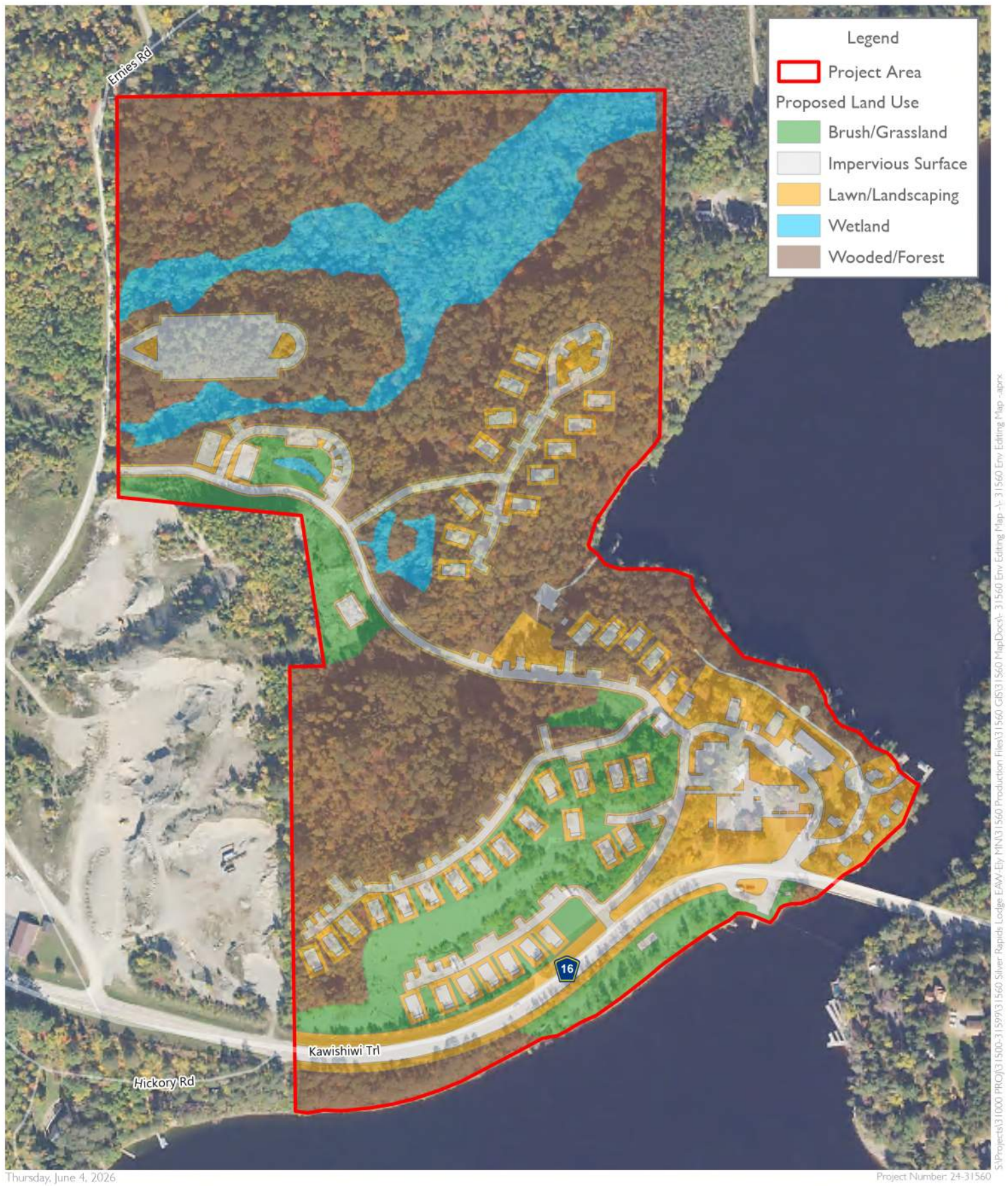


Figure 4
Existing Land Use Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota



0 150 300
ft
1 inch = 300 feet



Figure 5
Proposed Land Use Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

Source(s):
 Orthophoto (FSA, 2025)

ISG

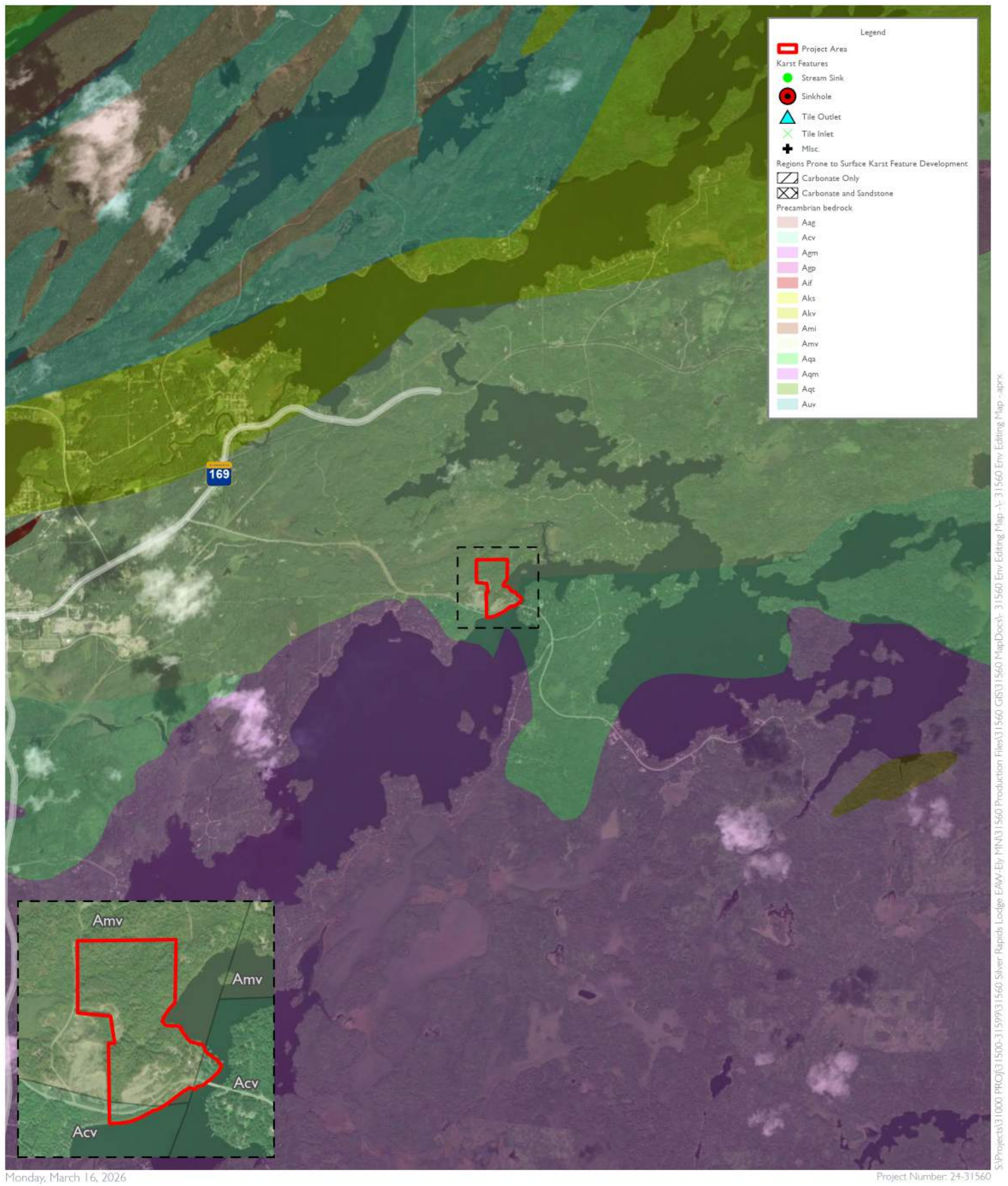


Figure 6
Geology Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

0 0.5 1
 Miles
 1 inch = 1 miles



Source(s):
 Orthophoto (ESRI, 2023)
 Karst (MnDNR, 2026)
 Geology (MGS, 2026)

ISG



Figure 7
Lake County
Soil Survey Map
Silver Rapids Lodge

Fall Lake Twp, Lake County, Minnesota

0 150 300
 ft
 1 inch = 300 feet



Source(s):
 Orthophoto (FSA, 2025)
 Soil Survey (USDA NRCS, 2026)

ISG

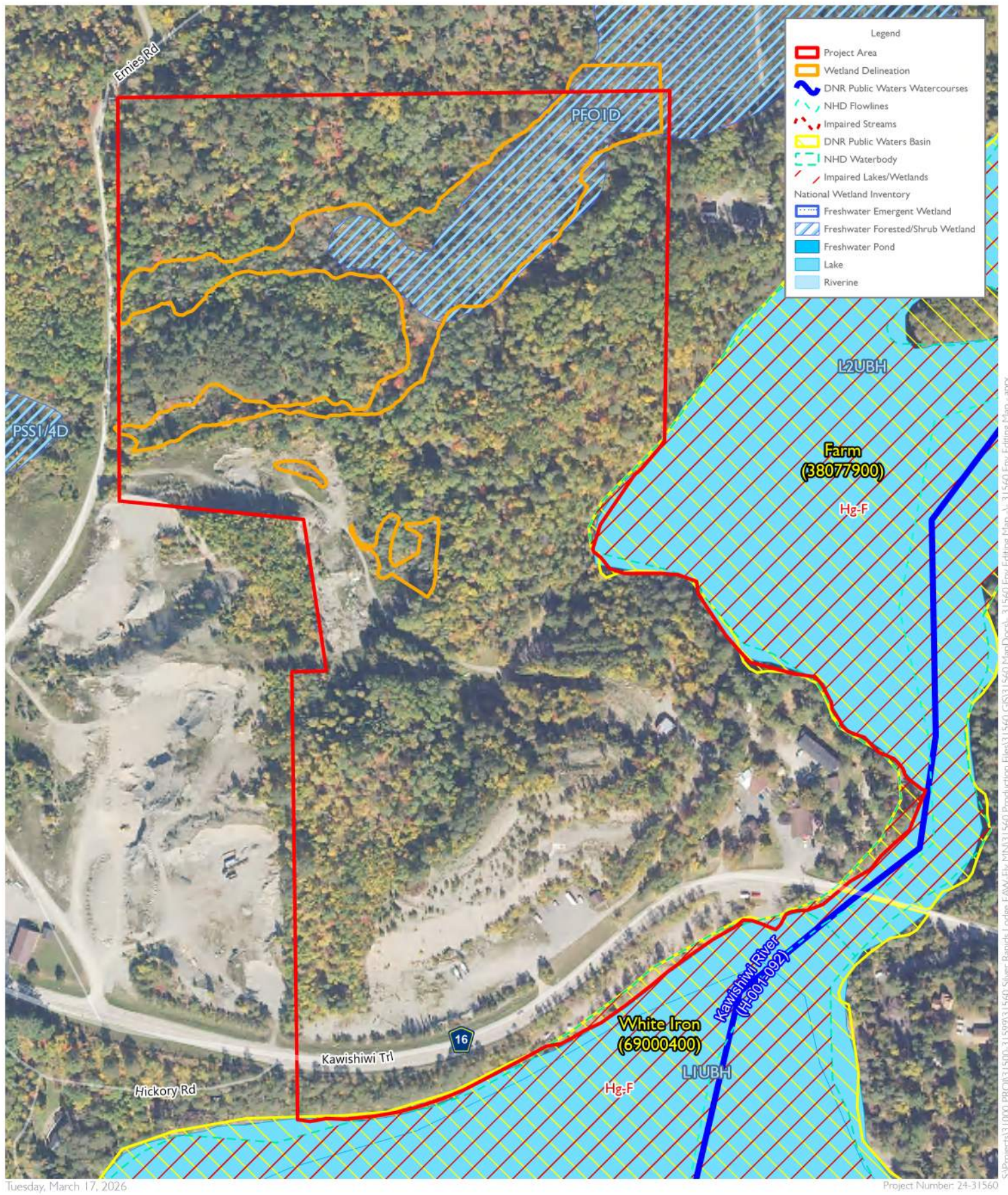
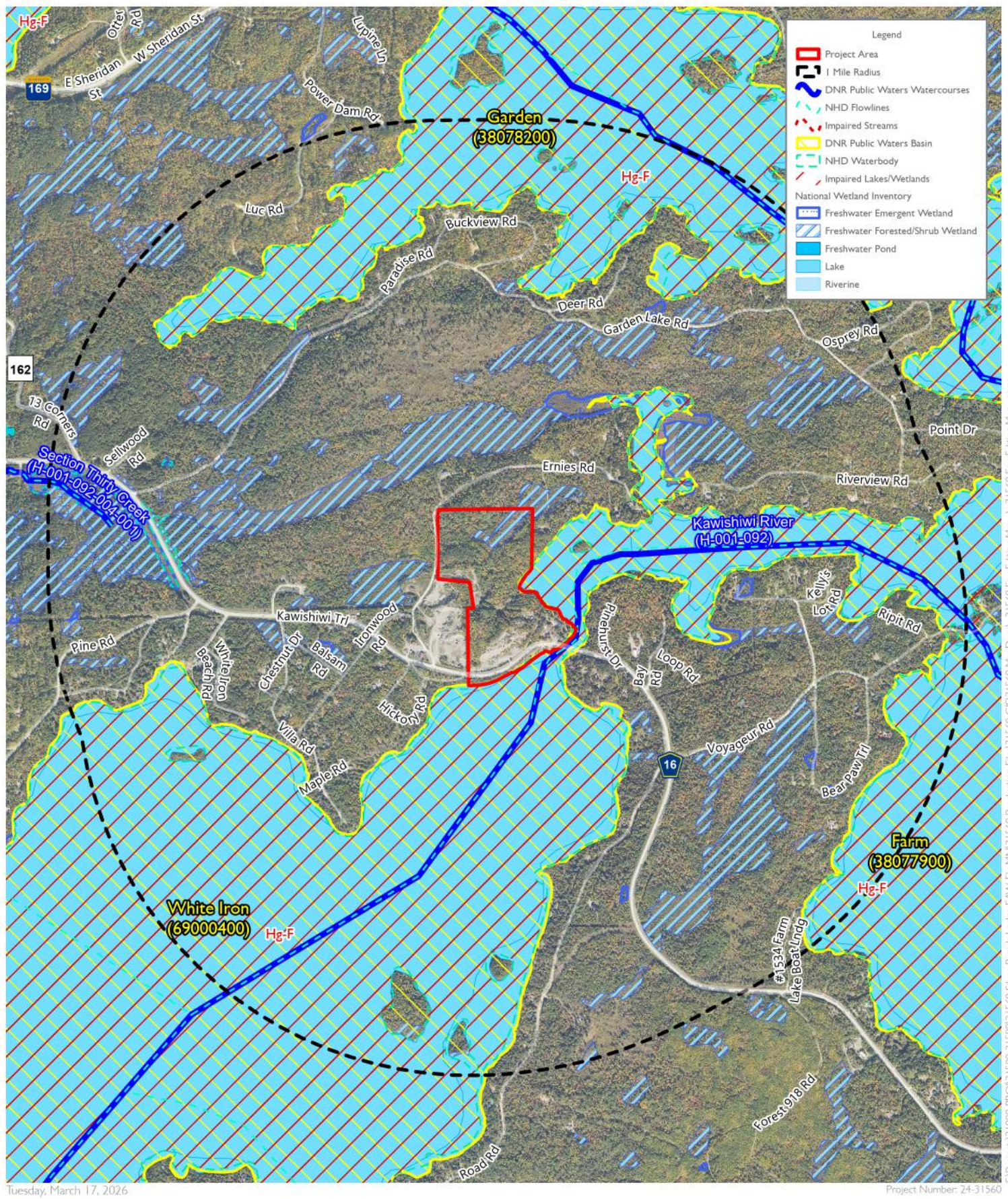


Figure 9a
Surface Water Resources Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

Source(s):
 Orthophoto (FSA, 2025)
 Wetland Delineation (GEL, 2023)
 NWI (MnDNR, 2026)
 PWI (MnDNR, 2026)
 NHD (USGS, 2026)
 Impaired Waters (MPCA, 2024)





0 875 1,750
ft
1 inch = 1,750 feet



Figure 9b
Surface Water Resources Map
Silver Rapids Lodge
Fall Lake Twp, Lake County, Minnesota

Source(s):
Orthophoto (FSA, 2025)
NWI (MnDNR, 2026)
PWI (MnDNR, 2026)
NHD (USGS, 2026)
Impaired Waters (MPCA, 2024)

ISG

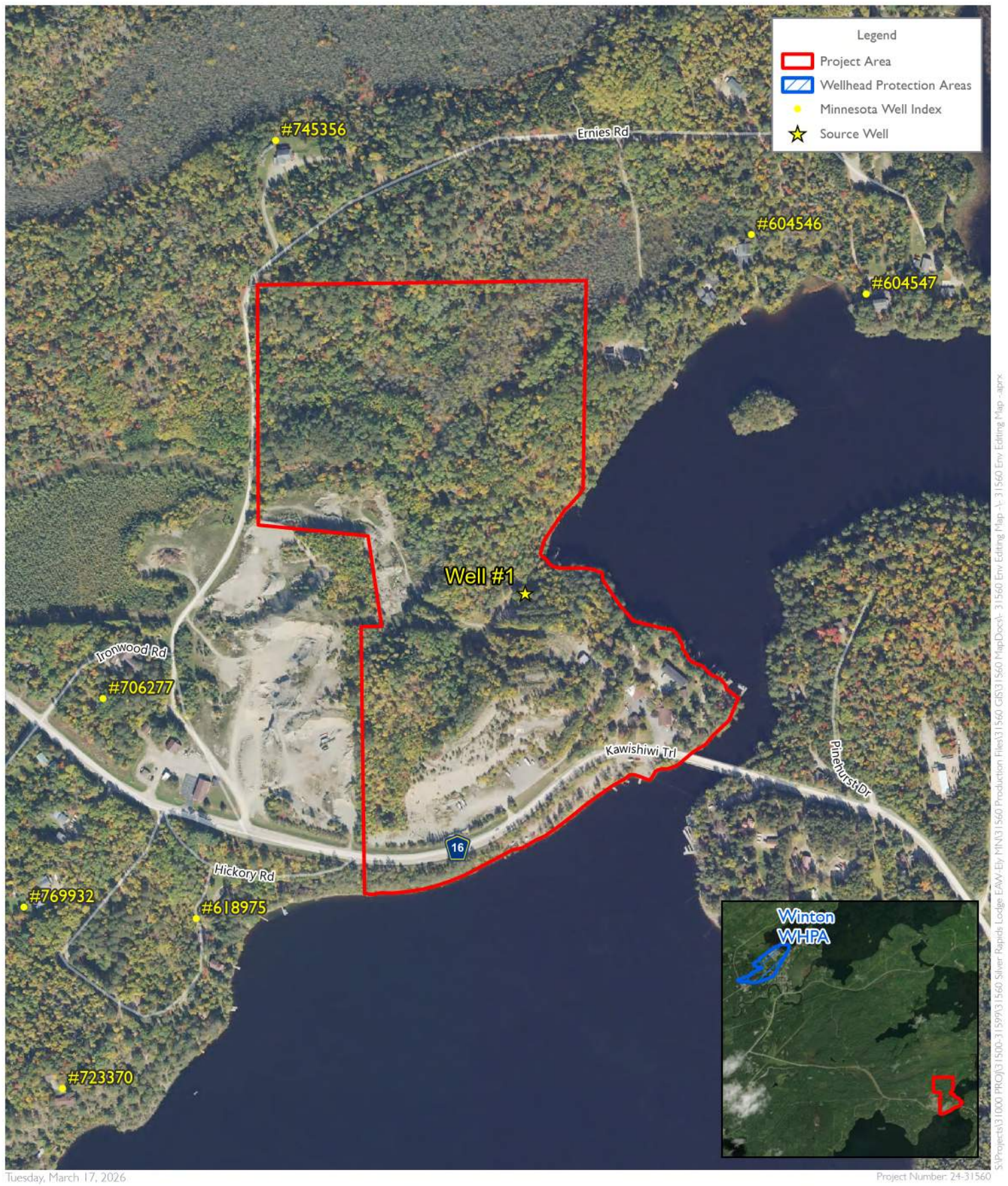


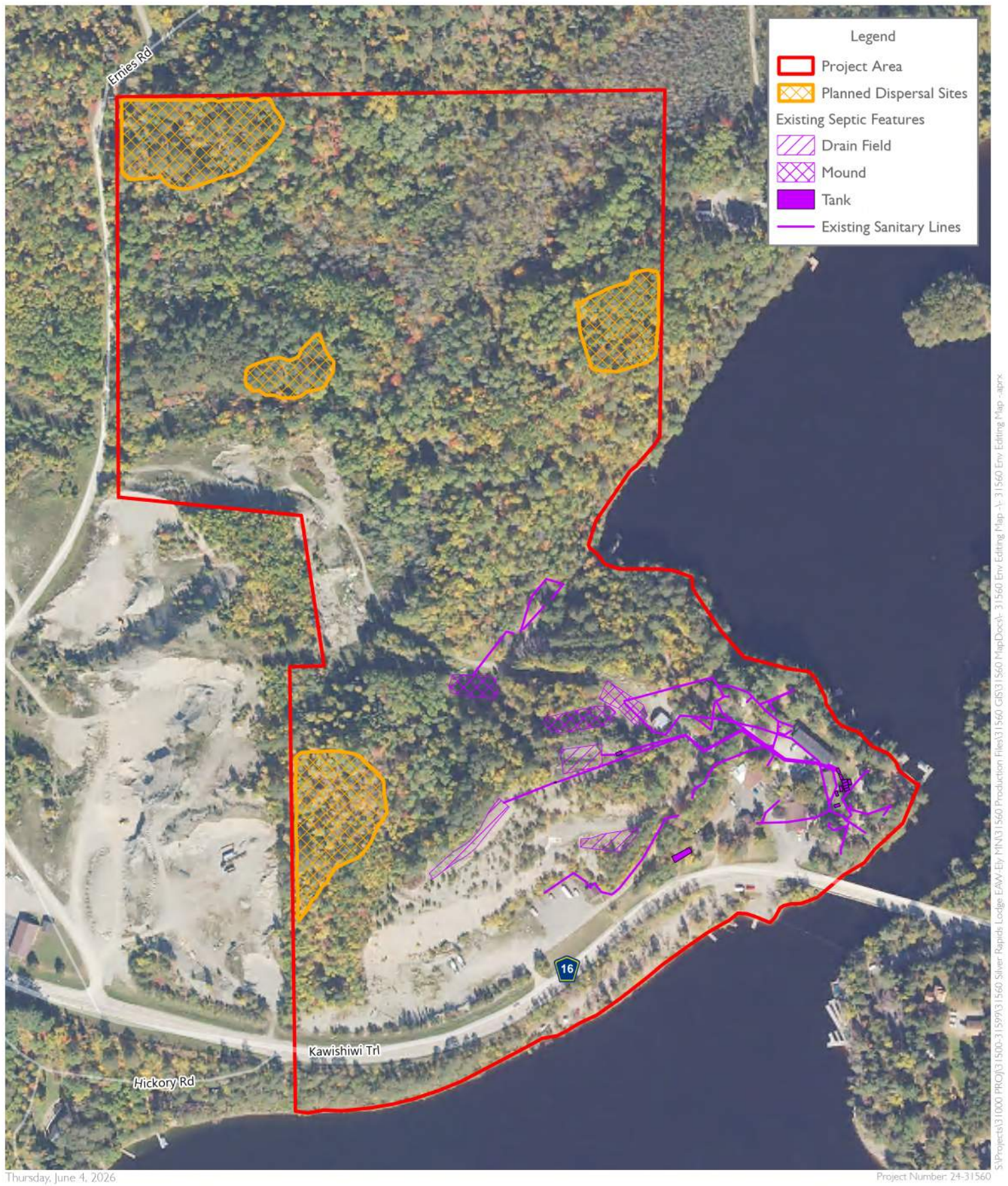
Figure 10
Groundwater Resources Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

0 250 500
 ft
 1 inch = 500 feet



Source(s):
 Orthophoto (FSA, 2025)
 MWI (MDH, 2026)
 WHPA (MDH, 2026)

ISG



0 150 300
ft
1 inch = 300 feet



Figure 11
Wastewater Features Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

Source(s):
 Orthophoto (FSA, 2025)

ISG

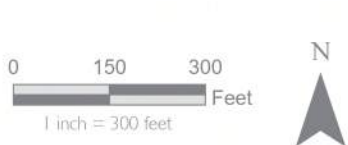


Figure 12
Water Supply System Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

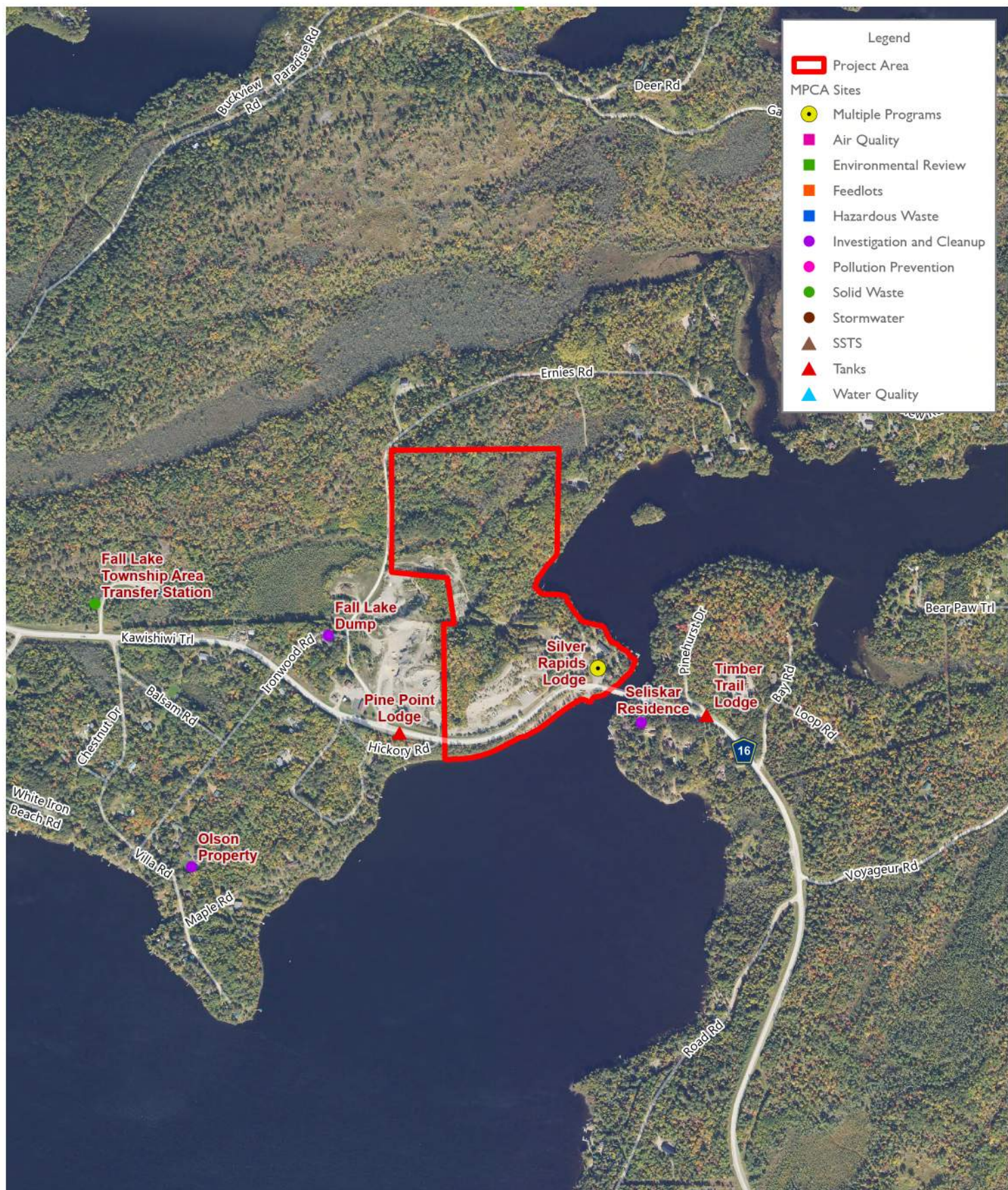


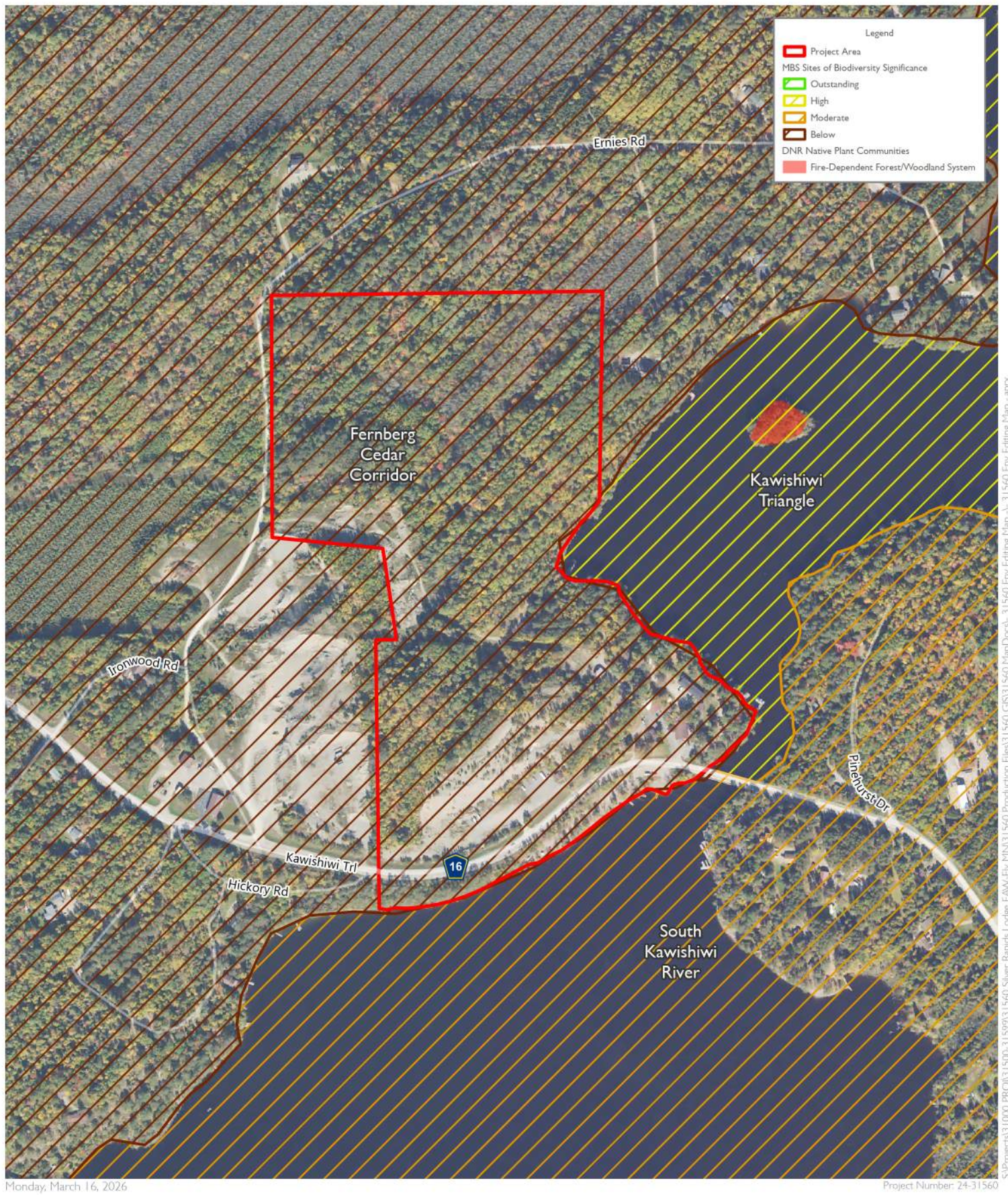
Figure 13
What's In My Neighborhood Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

0 500 1,000
ft
1 inch = 1,000 feet



Source(s):
Orthophoto (FSA, 2025)
WIMN (MPCA, 2026)

ISG



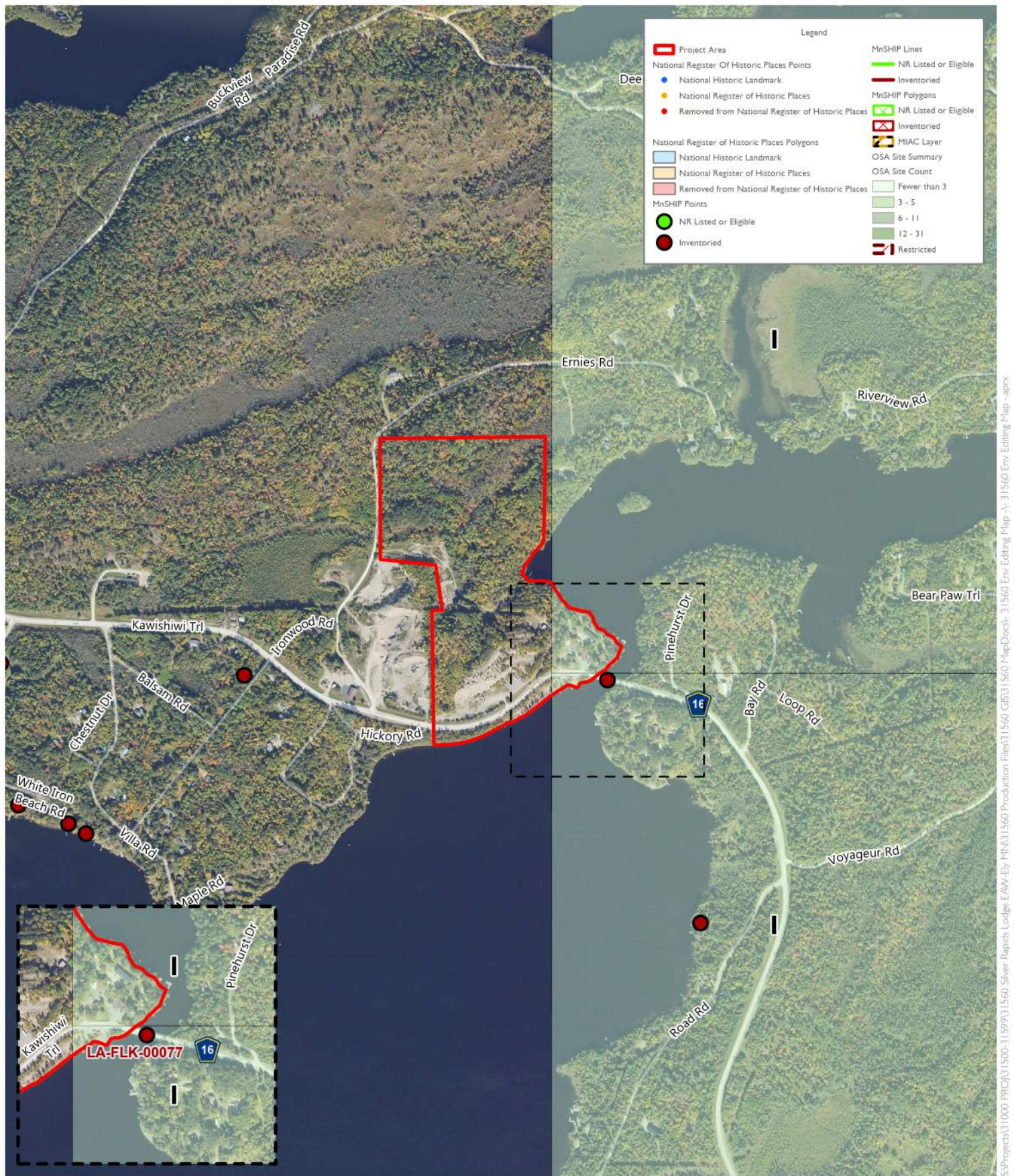
0 250 500
ft
1 inch = 500 feet



Figure 14
Ecological Resources Map
Silver Rapids Lodge
Fall Lake Twp, Lake County, Minnesota

Source(s):
Orthophoto (FSA, 2025)
MBS Sites (MnDNR, 2026)
Plant Communities (MnDNR, 2026)

ISG



Friday, March 13, 2026

Project Number: 24-31560

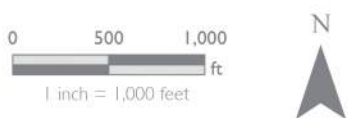
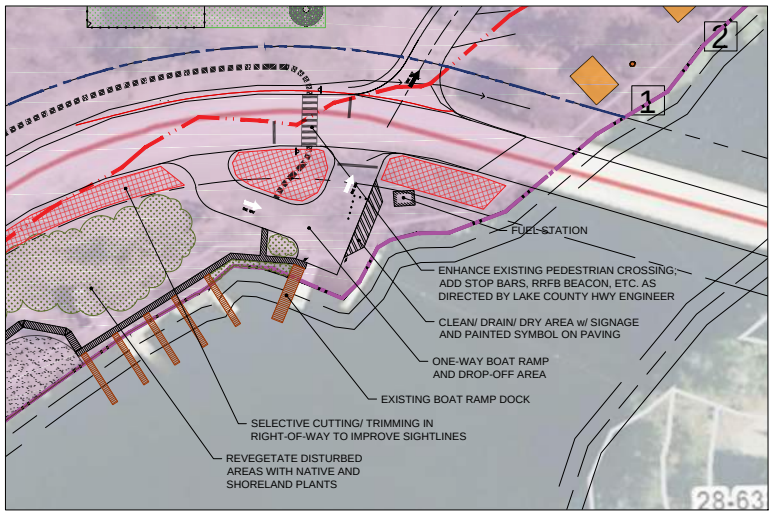
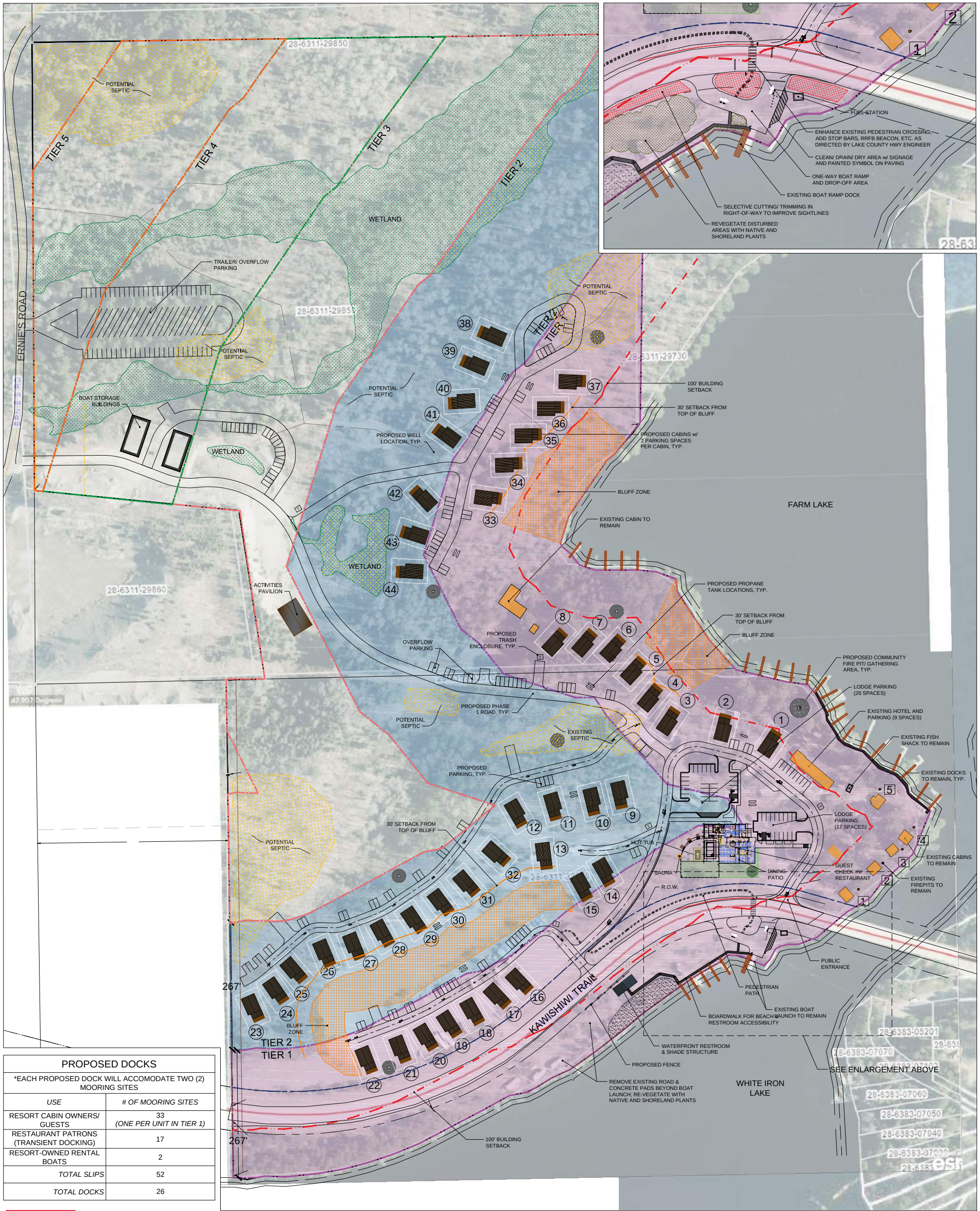


Figure 15
Cultural Resources Map
Silver Rapids Lodge
 Fall Lake Twp, Lake County, Minnesota

Source(s):
 Orthophoto (FSA, 2025)
 MnSHIP (SHPO, 2026)
 OSA (OSA, 2026)
 NRHP (NPS, 2026)



Appendix B – Site Plan



PROPOSED DOCKS	
*EACH PROPOSED DOCK WILL ACCOMMODATE TWO (2) MOORING SITES	
USE	# OF MOORING SITES
RESORT CABIN OWNERS/ GUESTS	33 (ONE PER UNIT IN TIER 1)
RESTAURANT PATRONS (TRANSIENT DOCKING)	17
RESORT-OWNED RENTAL BOATS	2
TOTAL SLIPS	52
TOTAL DOCKS	26

SILVER RAPIDS - PROPOSED DEVELOPMENT

APRIL 2026

Appendix C – Land Use and Zoning

Silver Rapids Lodge - Lake County Zoning Map



3/9/2026, 8:32:04 AM

Townships

Parcels

Federal

Regional Government; Private; Municipal; Unknown

Regional Government; Private; Municipal; Unknown

Regional Government; Private; Municipal; Unknown

Regional Government; Private; Municipal; Unknown

Regional Government; Private; Municipal; Unknown

State

County Managed

County Managed

Zoning Districts

CR

CU

FR

M

PC

R-1

R-2

R-3

R-4

RC

RR

UP

Contact Planning & Zoning

Contact Planning & Zoning

Contact Planning & Zoning

World_Hillshade

1:4,451

0190380760 ft

055110220 m

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, NASA, NGA, USGS, FEMA

Appendix D – Geotechnical Report

SILVER RAPIDS LODGE SUBSURFACE INVESTIGATION AND GEOTECHNICAL REPORT

ELY, MINNESOTA

PREPARED FOR:

SILVER RAPIDS LODGE SPE, LLC
459 KAWISHIWI TRAIL
ELY, MINNESOTA 55731

PREPARED BY:

NORTHEAST TECHNICAL SERVICES, INC.
526 CHESTNUT STREET
VIRGINIA, MINNESOTA 55792

NTS PROJECT# 10812DAA

JUNE 2024



PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

EVAN JOHNSON, PE

LICENSE NO. 53755

JUNE 6, 2024

June 6, 2024

Silver Rapids Lodge, SPE, LLC
459 Kawishiwi Trail
Ely, Minnesota 55731

**RE: Subsurface Exploration and Geotechnical Report
Silver Rapids Lodge Development – Ely, Minnesota**

To Whom it May Concern:

Northeast Technical Services, Inc. (NTS) is pleased to present this report for the above referenced project. This letter report includes the logs of nineteen (19) soil borings performed at the site, a description of our understanding of the project, and an assessment of the site in regards to construction and design of the proposed development.

We have appreciated the opportunity to assist with this project. Please contact Allison Mattson at (218) 750-7278 or amattson@netechnical.com, or Evan Johnson at (218) 780-9100 or ejohnson@netechnical.com if you have any questions regarding this report.

Sincerely,
Northeast Technical Services, Inc.



Evan C. Johnson, PE
Geotechnical Engineer



Allison Mattson, EIT
Geological Engineer

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APPENDIX A: SOIL BORING LOGS

APPENDIX B: LABORATORY TESTING RESULTS

1.0 Project Description and Scope of Work

1.1 Project Overview

The project consists of a new development at the Silver Rapids Lodge located near the city of Ely, Minnesota. Silver Rapids Lodge SPE, LLC retained Northeast Technical Services, Inc. (NTS) to perform a subsurface geotechnical investigation to assess the soil conditions within the project area for new building construction, road design, and parking lots. The project site and soil boring locations are shown on Figure 1.

1.2 Existing Site Conditions

The project consists of a 42-acre property located at the physical address of 459 Kawishiwi Trail and has been occupied by Silver Rapids Lodge resort since approximately 1919. The project area is bound by White Iron Lake to the south, Farm Lake to the east, a gravel pit to the west, and undeveloped wooded land to the north. Topography of the property grades from northwest to southeast from a high point elevation of 1,500 feet (NAVD88) at the northwestern boundary to 1,385 feet at the southern and eastern boundaries.

1.3 Scope of Work Performed

A total of 19 soil borings were advanced in the general vicinity of the locations shown on the preliminary site plan. The soil borings were staked in the field by NTS using high accuracy Trimble GPS equipment. The soil borings were planned to be advanced to 15 feet; however, refusals were encountered in 11 of the 19 locations between three and 11.5 feet below the ground surface. High accuracy Trimble GPS equipment was used to record the boring locations once completed.

Soil conditions were logged and selected soil samples were tested for physical properties. A site history was compiled and background search conducted for available information regarding soil types and groundwater levels. The collected data has been used to generate the recommendations found in this report.

1.4 Subsurface Exploration

The soil borings were completed by a drill crew from Range Environmental Drilling utilizing a Geoprobe® drill rig. The borings were advanced using split spoon sampling ahead of 3-inch direct push casing. Geotechnical data was acquired utilizing an automatic drop hammer system in accordance with ASTM D1586, "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils." In general, split spoon samples were collected every 2 ½ feet to 10 feet, then every 5 feet thereafter.

Table 1 below summarizes locations, elevations, and depths the soil borings completed during the investigation.

Table 1. Soil Boring Summary

Name	Surface Elevation (NAVD88, USFT)	Depth (USFT)	Northing (UTM 15N, m)	Easting (UTM 15N, m)
B-01	1439.10	15	5306638.33	592595.63
B-02	1437.76	15	5306626.78	592657.03
B-03	1431.15	8.1	5306613.82	592727.68
B-04	1417.21	15	5306536.40	592766.08
B-05	1408.14	6	5306511.41	592870.50
B-06	1442.05	15	5306482.09	592945.41
B-07	1411.75	3	5306323.58	592919.16
B-08	1421.05	8	5306359.11	592953.50
B-09	1435.81	15	5306402.91	592978.34
B-10	1434.63	15	5306435.30	592989.04
B-11	1420.78	11.5	5306443.60	593053.31
B-12	1419.24	8.5	5306425.00	593068.81
B-13	1400.68	8	5306368.89	593049.09
B-14	1444.85	15	5306381.89	592930.92
B-15	1433.85	8	5306413.08	592995.96
B-16	1413.70	7.5	5306389.34	593000.31
B-17	1412.89	6	5306394.86	593024.11
B-18	1410.63	15	5306368.70	592996.28
B-19	1402.06	8	5306368.63	593027.55

All soils were classified in the field in accordance with the Unified Soil Classification System (USCS). Field classification included an estimate of the distribution of grain size, plasticity, organic content, moisture condition, color, presence of lenses or seams, and apparent geologic origin. Representative portions of the collected soils were retained in sealed jars and/or bulk sample bags. These representative samples were delivered to the NTS laboratory and selected samples submitted for laboratory testing.

2.0 Subsurface Conditions

2.1 Geologic Setting

Based on the Preliminary Surficial Geologic Map of the Central Arrowhead Area, Lake and St. Louis Counties, Northeastern, Minnesota prepared by Elizabeth L. Dengler and Kaleb Wagner in 2016, surficial geology consists of sand and gravel associated with glaciofluvial deposits of the Boundary Waters Formation.

The Minnesota Geologic Survey (MGS) “Bedrock Geologic map of the Central Arrowhead Area, Lake and St. Louis Counties, Northeastern Minnesota” updated in 2016 indicates that the site overlies Upper Ely Greenstone mafic volcanic bedrock. Geologic maps indicate the depth to bedrock ranges from outcropping at the surface near the northern boundary to approximately 35 feet in the west-central portion of the property.

The mapped surficial geology and bedrock geology appear to be in general agreeance with the subsurface exploration results described below.

2.2 Exploration Summary

For the purpose of this report, borings are split into two categories based on 1) borings located within or near proposed building footprints, and 2) borings located within proposed roadways or parking lots.

Proposed Building

Borings B-06, B-14, B-16, B-17, B-18, and B-19 were advanced with the purpose of evaluating subsurface conditions below proposed buildings. Borings B-06 and B-18 encountered approximately 2.5 feet to 7.5 feet of fill materials consisting of Poorly-graded Sand with Silt and Silty Sand with Gravel followed by native glacial deposits consisting of Silty Sand with Gravel, Poorly-graded Sand with Silt and Gravel, and Poorly-graded Sand with Clay. Borings B-14, B-16, B-17, and B-19 encountered native glacial deposits from the surface to the termination depths of the borings. The granular glacial soils were gray to brown in color and contained gravel, cobbles, and boulders. Penetration resistance values (N-Values) ranged from 3 blows per foot (bpf) to 50 blows per 0 inches of advancement indicating the native granular soils had a very loose to very dense relative density.

Locating the interface between native soils and placed fill soils was not easily assessed at many of the borings, likely due to the fill materials being sourced nearby and having a very similar consistency. Descriptions provided on the boring logs found in Appendix A are the engineers best judgement but may be subject to error.

Proposed Roadway or Parking Lot

Borings B-01, B-02, B-03, B-04, B-05, B-07, B-08, B-09, B-10, B-11, B-12, B-13, and B-15 were advanced with the purpose of evaluating subsurface conditions below proposed roadways or parking lots.

At the surface, borings B-09 and B-13 measured approximately two inches of bituminous, followed by 2.5 to four feet of fill materials consisting of Poorly-graded Sand with Silt and Clayey Sand that was gray to brown in color; and borings B-01, B-02, B-10, B-11, and B-12 encountered 2.5 to 7.5 feet of fill material that consisted of Silty Sand with Gravel, Clayey Sand, and Poorly-graded Sand with Silt. Organics and wood material was observed intermixed with the fill material in B-11. Below the surface materials, these borings encountered native glacial deposits consisting of Silty Sand with Gravel, Poorly-graded Sand with Silt and Gravel, Clayey Sand, and Poorly-graded Sand with Clay that extended to the termination depths of the borings. Borings B-03, B-04, B-05, B-07, B-08, and B-15 encountered native glacial deposits from the surface to the termination depths of the borings. The granular glacial soils were gray to brown in color and contained gravel, cobbles, and boulders. N-values ranged from 2 blows to 50 blows for 0 inches advancement, indicating the granular soils had a very loose to very dense relative density.

2.3 Laboratory Testing Results

Laboratory testing was performed on select soil samples that were representative of general site conditions and soil types. Laboratory analysis of the collected soils included five soil gradations (ASTM D6913) and nine moisture content tests (ASTM D2216).

Table 2 below summarizes the results of the laboratory testing.

Table 2: Summary of Laboratory Testing

Boring Number	Depth (ft)	Moisture (%)	% Passing #200
B-01	2.5-5	4.3	-
B-02	2.5-5	4.8	12.1
B-06	0-2.5	11.4	-
B-06	12.5-15	7.9	-
B-08	0-2.5	5.1	10.1
B-09	0-2.5	5.5	-
B-12	5-7.5	10.7	18.3
B-13	2.5-5	6.9	-
B-14	2.5-5	7.0	-

Table 2: Summary of Laboratory Testing (cont'd)			
Boring Number	Depth (ft)	Moisture (%)	% Passing #200
B-14	7.5-10	6.4	-
B-16	2.5-5	6.9	-
B-17	2.5-5	10.1	18.0
B-18	7.5-10	11.4	17.9
B-19	5-7.5	15.6	-

The soil gradation results were utilized to further refine field soil classifications of the collected samples. Due to the significant cobbles and boulder content observed in the brown Gravelly Silty Sand, the gradations likely underestimate the overall cobble/boulder content since these fractions are hard to collect and measure. All data obtained from the field observations and laboratory testing can be viewed in the boring logs in Appendix A. The laboratory testing data can be viewed in Appendix B.

2.4 Groundwater Measurements

Water was encountered only in borings B-01 and B-03 at 12.5 feet and 5 feet below land surface, respectively. Water was not measured during or after drilling in the remaining boring locations advanced across the site. The project area is bound by White Iron Lake to the south and Farm Lake to the east. Minnesota Department of Natural Resources (MN DNR) elevation data from MnTOPO suggests the water level of these surface water features is around an elevation of 1,385 feet.

Groundwater monitoring wells or piezometers would be required to more accurately determine water levels at the site. Seasonal and annual fluctuations in the groundwater levels should be expected.

3.0 Proposed Construction & Design Data

The project consists of constructing a new lodge for the resort, along with approximately 49 rental cabins, an access road, and parking areas for each structure. Construction work is proposed in three separate phases. The new lodge is proposed to be a two-story building with a swimming pool, hot tub, and patio deck. Preliminary construction details have not been provided.

Preliminary traffic loading information was not provided for the purpose of this report. We have assumed that the parking lot will experience both heavy duty and light duty traffic loads.

4.0 Structure Recommendations

4.1 Earthwork

4.1.1 Excavation Depths

All bituminous, vegetation, debris, and otherwise unsuitable materials should be completely removed from below all proposed structures and oversized areas. Additionally, all oversized materials (3-inch plus) should be removed from at least 1-foot below all foundations and slabs.

The underlying soils are generally suitable for foundation and slab support. All soils encountered at depth during the subsurface exploration and laboratory testing indicated a fines content of less than 20% and would be generally classified as ‘Granular Borrow’ by MNDOT 3149.

Prior to placement of engineered fill and/or footings, the subgrade shall be observed by a qualified geotechnical professional and verified that the subgrade consists of soils identified in the subsurface program. If subgrade soils differ from those identified in the soil borings, the geotechnical engineer shall be contacted prior to placement of engineered fill or foundations to provide recommendations.

4.1.2 Bedrock Depths

Shallow refusal was met in 11 of the 19 boring locations between 3 and 11.5 feet below the ground surface. Geologic maps and observations of the area show shallow bedrock exists throughout the project area; however, it is unclear if all refusals were due to shallow bedrock or due to large boulders and cobbles throughout the site. Table 3 below summarizes estimated bedrock depths and elevations.

Table 3: Bedrock Depths

Boring Number	Ground Surface Elevation (ft.)	Refusal Depth (ft.)	Est. Bedrock Elevation (ft.)
B-03	1431.15	8.1	1423.05
B-05	1408.14	6.0	1402.14
B-07	1411.75	3.0	1408.75
B-08	1421.05	8.0	1413.05
B-11	1420.78	11.5	1409.28
B-12	1419.24	8.5	1410.74
B-13	1400.68	8.0	1392.68
B-15	1433.85	8.0	1425.85

Table 3. Bedrock Depths, (cont'd)			
B-16	1413.7	7.5	1406.20
B-17	1412.89	6.0	1406.89
B-19	1402.06	8.0	1394.06

The shallow refusal depths that may impact construction of structures or associated utilities should be further assessed by test pitting with an excavator to confirm if the refusals were indicative of bedrock or cobbles/boulders.

4.1.3 Oversizing

The excavations must be oversized laterally beyond the planned outside edges of the foundations. Any corrective excavations should be oversized at least 1 foot beyond the foundations for every foot of fill placed below footing grade (1:1 oversized).

4.1.4 Fill Placement and Compaction

The onsite soils may be considered for reuse as structural fill; however, all fill materials should be free of organics, debris, oversized materials and properly moisture conditioned during placement. If the existing fill materials are reused on site, representative samples should be submitted to a geotechnical laboratory for testing and review prior to the start of construction.

For ease in construction, we recommend using clean sands or gravels having less than 20 percent particles passing a #200 sieve and a maximum particle size of 3 inches. In areas requiring non-frost susceptible soils such as sidewalks or exterior slabs, fill materials should have a maximum of 7 percent by weight passing the #200 sieve and a maximum aggregate size of 3 inch.

Below building and oversized areas, fill materials should be compacted to a minimum of 98 percent Standard Proctor density (ASTM D 698). All fill soils should be placed within ± 3 percentage points of optimum moisture content as determined by the Standard Proctor. All granular fill materials should be placed in lifts no greater than 8 inches in depth and be compacted with a large self-propelled vibratory compactor.

Table 4: Fill and Compaction Recommendations

Subgrade Location	Soil Types	Grain Size Requirements	Compaction Requirements
Below Foundations	SP, SW, SP-SM, SM	100% passing 3-inch sieve <20% passing #200 sieve	98% Standard Proctor ±3% Optimum Moisture
Drainage Layer Pipe Bedding Non-Frost-Susceptible	GP, GW, SP, SW	100% passing 1-inch sieve <7% passing #200 sieve	95% Standard Proctor
Exterior Slabs	GP, GW, GP-SM, SP, SW, SP-SM	100% passing 3-inch sieve <7% passing #200 sieve	95% Standard Proctor ±3% Optimum Moisture
Pavements	GP, SP, SP-SM, SM, SC, CL	100% passing 3-inch sieve in upper 3 feet 100% passing 6-inch sieve below 3 feet	100% Standard Proctor within 3 feet of surface, 95% Standard Proctor >3 feet below surface
Landscaped Areas	GP, SP, SP-SM, SM, SC, CL	100% passing 6-inch sieve	90% Standard Proctor

4.2 Foundation Design

The proposed building may be supported on shallow spread footings bearing on native granular soils or compacted engineered fill overlying native granular soils. We do not recommend placing any footings or foundations on any clay soils. Any clay at footing grade should be subcut down to native granular soils.

Exterior strip footings shall bear a minimum of 5 feet below the exterior ground surface to provide sufficient embedment for the net bearing capacity and protection from freezing temperatures and frost.

For footings embedded a minimum 5 feet below final grade, the net allowable bearing capacity is 3,000 pounds per square foot (psf). Total settlement for footings designed and constructed in accordance with the recommendations outlined in this report are anticipated not to exceed 1 inch. Differential settlement between equally sized and loaded foundations is expected to be on the order of ½-inch or less.

4.2.1 Change in bearing strata

With sloping shallow bedrock expected at some locations across the site, foundations for proposed buildings may intersect bedrock and native sandy soils along the same footing grade. It is recommended that either footings be poured completely on bedrock or that a 12-inch sand

‘cushion’ be placed below the footing above the bedrock interface. This is to prevent differential settlement and cracking due to the variation in bearing strata.

4.3 Concrete Slabs

4.3.1 Interior Slabs

Interior floor slabs foundations should be placed over a minimum of 6 inches of clean sand having less than 7 percent particles by weight passing a number 200 sieve. This sand layer will provide a capillary break to reduce moisture in the slab and will aid in final grading and concrete finishing. If floor coverings or coatings less permeable than concrete will be used, we recommend that a vapor retarder or vapor barrier be placed immediately beneath the slab. Some contractors prefer to place this barrier below the sand, to limit the potential for curling. The vapor retarder will help reduce the potential for the upward migration of water vapor from the soil into and through the concrete slab. We recommend consulting the floor covering manufacturer regarding appropriate type, use, and installation of the vapor retarder or vapor barrier.

All floor slabs placed on compacted engineered fill overlying native granular soils may be designed with a modulus of subgrade reaction of 250 pounds per cubic inch.

4.3.2 Exterior Slabs

Exterior slabs will likely be underlain native granular soils. Grain size analyses showed these materials contain between 10 and 18 percent particles by weight passing the number 200 sieve which may present as moderate risk of frost heave if these soils become saturated and freeze. Even small amounts of heave can create tripping hazards and problems in critical grade areas such as exterior doors.

To reduce frost heave related issues, we recommend the removal all frost-susceptible soils from below exterior slabs down to the bottom of footing grades, i.e. a minimum of 5 feet below exterior grades. The frost-susceptible soils should then be replaced with clean sand or gravel having less than 7 percent particles by weight passing the number 200 sieve. The bottom grades should be sloped away from the building and drain tile should be installed along the bottom outer edges of the excavation to remove any excess water that may accumulate within the non-frost-susceptible fill. The excavation to remove the frost-susceptible soils should be sloped at a minimum of a 2 horizontal: 1 vertical gradient. This will help to reduce any abrupt transitions between the frost-susceptible and non-frost susceptible soils where differential heaving may occur.

4.4 Retaining Walls

We recommend drain tile be placed behind the retaining walls, adjacent to the wall footing to remove any excess water from building up behind the walls. If drain tile is used in the design of

the retaining walls, it should consist of a perforated pipe embedded in gravel pipe-bedding material. The drain tile should be routed to a storm sewer, sump pump, or other suitable discharge site.

The retaining wall will have lateral loads from the soil transmitted to them. The soils encountered on site consisted of native sandy soils. We recommend that backfill placed within 2 feet of the below grade walls have a maximum particle size of 3 inches and consist of sand having less than 50 percent particles by weight passing the #40 sieve and less than 7 percent passing the #200 by weight.

Active earth pressures can be used to design the below grade walls if the walls are allowed to rotate slightly. If wall rotation cannot be tolerated then the wall design should utilize at-rest earth pressures. Table 6 below lists soil parameters for the design of below grade walls. These values assume a drained soil compacted to 95 percent of its Standard Proctor density and a level ground surface.

Table 6. Earth Retaining Soil Parameters

Soil Type	USCS Classification	Estimated Unit Weight (pcf)	Estimated Friction Angle (degrees)	At-Rest Pressure (pcf)	Active Soil Pressure (pcf)	Passive Soil Pressure (pcf)
Sand	SP, SW, SP-SM, SM	120	32	48	38	390
Clay	CL	115	24	70	38	285

Passive resistance against the wall footings and sliding resistance along the bottom of the wall footings will provide resistance to lateral earth pressures. We recommend using a coefficient of friction value of 0.35. This value does not include a factor of safety.

If utilizing modular block for retaining wall construction, we recommend that at least 1 layer of geogrid reinforcement at 2/3 wall height be included in the block retaining wall designs for all block walls that will retain at least 2 feet of earth. Additional reinforcement may be required depending on block type and wall height. The block manufacturer shall be consulted for wall design.

5.0 Pavement Recommendations

5.1 Stripping and Grading

We recommend stripping the existing bituminous, vegetation and topsoil from below all pavements and paved areas. The native granular soils are a suitable subgrade below pavements; however, they will be more susceptible to disturbance from construction traffic and will require greater management during construction to ensure proper moisture conditioning is maintained. If the clay soils are encountered and become overly wet and are disturbed during construction, they may require subcutting and removal.

All subgrade soils should then be scarified to encourage uniformity and compacted as needed to pass a test roll. We recommend the test roll be observed by qualified geotechnical personnel.

5.2 Fill Placement and Compaction

If fill is needed below paved areas, the onsite materials appear to be suitable for reuse as fill. For ease in construction, we recommend using clean sands or gravels having less than 20 percent particles passing a #200 sieve and a maximum particle size of 3 inches.

Fill placed at depths greater than 3 feet below finished grade may be allowed to have a maximum particle size up to 6 inches, with no greater than 30% retained on the 1-inch sieve.

Fill placed to construct the pavement subgrade should be compacted to at least 100 percent of its maximum standard Proctor density within 3 feet of the surface, or 95% if greater than 3 feet below finished grade. The completed pavement subgrade should pass a test roll before placing drainage sand subbase and/or aggregate base. Pavement subgrades not passing the test roll should be rework as needed to pass the test roll (MNDOT 2111).

5.3 Estimated R-Values & Granular Subbase

The subgrade soils present at the site will largely depend on the type of fill material used to bring the parking and drive areas to grade. Throughout the project area, subgrade soils will likely consist of native granular soils. Table 5 below summarizes estimated R-Values based on anticipated soil type.

Table 5. Estimated R-Values

Source	Soil Classification	Estimated R-Value
Imported Fill	SP	40
	SP-SM	40
	SM	30
Native Soils	SC	20
	SM	30
	SP, SP-SM	40

If areas of clayey or silty subgrades are encountered, we recommend a granular subbase be incorporated into the pavement section. The granular subbase provides a capillary break and drainage to help isolate the pavement from frost heave and provide a load distribution below the pavement section during spring thaw. We recommend the subbase material consist of select granular material (MnDOT 2149.2B2). Subgrades should be sloped to drain in areas with a granular subbase.

5.4 Preliminary Pavement Design

Traffic loading information was not provided for this report. We have provided both light and heavy-duty pavement section recommendations in Table 6 below.

Table 6. Pavement Section Recommendations

Pavement Material	Pavement Section (inches)		MnDOT Specification
	Light Duty	Heavy Duty	
Bituminous	3	6	2360
Base Aggregate	8	12	3138
Granular Subbase	12	12	3149.2B2
Granular Equivalents (GE)	20.75	31.5	-

These recommendations assume the subgrade has been moisture conditioned, compacted, and has passed a proof roll. In addition, the aggregate base should be compacted to 100% of its maximum standard Proctor dry density and proof-rolled prior to paving.

6.0 Construction Considerations

6.1 Excavation Safety

All excavations regardless of depth should be evaluated for stability prior to occupation by construction personnel. The stability of the excavation side slopes is dependent on soil strength, geometry, moisture content, and surcharge loading from excavated soils and/or construction equipment.

Excavations should be performed in accordance with pertinent local, state, and federal OSHA regulations. OSHA regulations in 29 CFR 1926, subpart P, 'Excavations' classify as Type A-B-C. Imported fill materials and native granular soils encountered at the site will generally classify as Type C soils. This must be verified by an onsite inspection during the work by a qualified competent person in accordance with OSHA regulations.

6.2 Water Considerations

Perched water was encountered in two of the nineteen soil borings advanced for this project. Any excess water that enters the excavations during construction should be removed from the excavation prior to the placement of fill and/or foundations. We anticipate that excess water should be capable of being removed with sumps and pumps.

Perched groundwater conditions are likely to occur at the interface between the native granular materials and underlying bedrock, especially during large precipitation events. It is highly recommended that perimeter foundation drain tile be installed and either daylighted at the east end of the building or tied into existing storm sewer infrastructure.

6.3 Cold Weather

If construction is anticipated to proceed during cold weather, all snow and ice should be removed from any excavations prior to the placement of fill materials, pavements, and/or concrete. Fill should not be placed on frozen soil and no frozen soil should be used as fill or structural backfill.

Concrete delivered to the site should meet the temperature requirements of the American Concrete Institute (ACI). Concrete should not be placed on frozen soils and should be protected from freezing until the desired strength is obtained.

6.4 Shallow Bedrock

Many of the borings encountered refusals before the planned termination depth indicating the potential of shallow bedrock. Shallow bedrock can be a challenge when desiring to create continuous grades for utilities, roads, or foundations. Additional effort to identify and plan for shallow bedrock locations prior to final design will assist in limiting inflated engineering costs

associated with civil redesign as well as construction costs associated with extra effort for unanticipated rock removals. Both the engineering and construction adjustments can also lead to significant delays associated with these changes.

Test pitting at locations where there is the potential of shallow bedrock as indicated by refusals in the subsurface exploration that may impact design is recommended so as to have a definitive understanding of the subsurface in these locations.

7.0 Qualifications

Recommendations provided herein are based on our professional judgment. The soil testing and geotechnical engineering services provided for this project have been conducted in a manner consistent with that level of skill and care ordinarily exercised by other members of the profession currently practicing in this geographical area under similar time and budget constraints. No other warranty is made.

The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects relevant to soils and foundations. In the event that any changes in the design from the assumptions outlined in this report are planned, NTS should be informed so that changes can be reviewed.



Figure 1 Proposed Development Map Silver Rapids Lodge Ely, Minnesota Lake County		Legend Project Location Lake County Tax Parcels Common Layers Interstate; US Highway MN Highway CSAH County Road Township/UT Road All Other Roads State/National Forest Road Geotechnical Soil Boring Contour (2 ft.)		Data Source MN-DOT Route Centerlines - State of Minnesota GeoCommons - https://gisdata.mn.gov/dataset/trans-roads-centerlines 2019 Aerial Imagery - Lake, MN (WMS) - https://data.sanborn.com/arcgis/services/Lake_County_MN/15cm_Orthos/ImageServer/WMS/Server
Figure 1		Disclaimer Map and/or data not appropriate for use in establishment of property boundaries, in property descriptions, or for any legal purposes; not appropriate for navigation; not for use by third parties.		
Project Number 10812DA Date Created 5/28/2024				
Author A Mattson, NTS				

Appendix A

Soil Boring Logs



COORD SYS

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COORD SYS

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								15 30 45 60			
								PL MC LL			
0								15 30 45 60			
		(SM) Silty Sand with Gravel, gray to brown, organics, damp. (Fill)	AU 1	100							
		(SM) Silty Sand with Gravel, gray, damp. (Glaciofluvial)	SS 2	33	9-8-6 (14)			● ■ ▲			
5		(SP-SM) Poorly-graded Sand with Silt, some gravel, gray, medium dense, damp. (Glaciofluvial)	SS 3	17	9-6-7 (13)			▲			
			SS 4	33	6-8-5 (13)			▲			
10											
		(SC) Clayey Sand, some gravel, brown, medium dense, damp. (Glaciofluvial)	SS 5	56	5-8-9 (17)			▲			
15		Bottom of borehole at 15.0 feet.									



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COORD SYS

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE ▲			
								15 30 45 60			
								PL MC LL			
								15 30 45 60			
								□ FINES CONTENT (%) □			
								20 40 60 80			
0		(SP-SM) Poorly-graded sand with Silt, some gravel, loose to medium dense, damp.	 AU 1	100							
		(Glaciofluvial)	 SS 2	17	8-6-5 (11)						
5			 SS 3	11	6-5-4 (9)						
			 SS 4	17	8-8-8 (16)						
10											
			 SS 5	17	8-9-10 (19)						
15		Bottom of borehole at 15.0 feet.									



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BORING NUMBER B-06

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CLIENT Silver Rapids Lodge SPE, LLC**PROJECT NAME** Silver Rapids Lodge Geotechnical Investigation**PROJECT NUMBER** 10812DAA**PROJECT LOCATION** Ely, Lake County, Minnesota**DATE STARTED** 5/9/24**COMPLETED** 5/9/24**GROUND ELEVATION** 1442.05 ft**HOLE SIZE** 3 Inch**DRILLING CONTRACTOR** Range Environmental**LOCATION:****DRILLING METHOD** Direct Push/SPT Sampling**NORTHING** 5306482.09**LOGGED BY** A. Mattson**CHECKED BY** E. Johnson**EASTING** 592945.41**GROUNDWATER** ---**COORD SYS**

GEOTECH BH PLOTS - GINT US.GDT - 5/28/24 09:41 - P:\PROJECTS\ALLISON MATTSON\10812DAA - SILVER RAPIDS LODGE - GEOTECHNICAL INVESTIGATION\MISCELLANEOUS\GINT\10812DAA BORING LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								15	30	45	60
								PL	MC	LL	
0		(SP-SM) Poorly-graded Sand with Silt, some gravel, brown, damp. (Fill)	AU 1	100				15	30	45	60
5		(SP) Poorly-graded Sand with Gravel, intermixed silt, cobbles, gray to brown, medium dense, damp. (Glaciofluvial)	SS 2	22	5-6-8 (14)						
			SS 3	17	6-8-8 (16)						
			SS 4	56	7-8-8 (16)						
15		Bottom of borehole at 15.0 feet.	SS 5	17	7-5-6 (11)						



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COORD SYS

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲				
								15	30	45	60	
								PL	MC	LL		
								15	30	45	60	
								☐ FINES CONTENT (%) ☐				
								20	40	60	80	
0												
		(SP-SM) Poorly-graded Sand with Silt, some gravel and cobbles, damp. (Glaciofluvial)	 AU 1	100								
		Refusal at 2 ft. first drilling attempt; offset by 5ft for second attempt. Refusal at 3.0 feet. Bottom of borehole at 3.0 feet.	 SS 2	50	2-50/0"							



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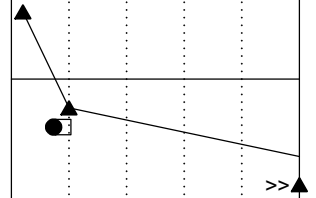
BORING NUMBER B-12

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CLIENT Silver Rapids Lodge SPE, LLC**PROJECT NAME** Silver Rapids Lodge Geotechnical Investigation**PROJECT NUMBER** 10812DAA**PROJECT LOCATION** Ely, Lake County, Minnesota**DATE STARTED** 5/10/24**COMPLETED** 5/10/24**GROUND ELEVATION** 1419.24 ft**HOLE SIZE** 3 Inch**DRILLING CONTRACTOR** Range Environmental**LOCATION:****DRILLING METHOD** Direct Push/SPT Sampling**NORTHING** 5306425**LOGGED BY** A. Mattson**CHECKED BY** E. Johnson**EASTING** 593068.81**GROUNDWATER** ---**COORD SYS**

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								15	30	45	60
								PL	MC	LL	
0								15	30	45	60
								15	30	45	60
								□ FINES CONTENT (%) □			
								20	40	60	80
		(SP-SM) Poorly-graded Sand with Silt, cobbles, gray, loose, damp. (Fill)	AU 1	100							
			SS 2	22	2-2-1 (3)						
5		(SM) Silty Sand, some gravel, cobbles, tan, medium dense to very dense, damp. (Glaciofluvial)	SS 3	33	4-6-9 (15)						
			SS 4	83	4-50/0"						
		Refusal at 8.5 feet. Bottom of borehole at 8.5 feet.									





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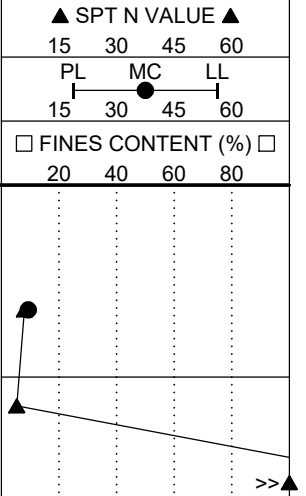
BORING NUMBER B-13

PAGE 1 OF 1

CLIENT Silver Rapids Lodge SPE, LLC**PROJECT NAME** Silver Rapids Lodge Geotechnical Investigation**PROJECT NUMBER** 10812DAA**PROJECT LOCATION** Ely, Lake County, Minnesota**DATE STARTED** 5/10/24**COMPLETED** 5/10/24**GROUND ELEVATION** 1400.68 ft**HOLE SIZE** 3 Inch**DRILLING CONTRACTOR** Range Environmental**LOCATION:****DRILLING METHOD** Direct Push/SPT Sampling**NORTHING** 5306368.89**LOGGED BY** A. Mattson**CHECKED BY** E. Johnson**EASTING** 593049.09**GROUNDWATER** ---**COORD SYS**

GEOTECH BH PLOTS - GINT US.GDT - 5/28/24 09:41 - P:\PROJECTS\ALLISON MATTSON\10812DAA - SILVER RAPIDS LODGE - GEOTECHNICAL INVESTIGATION\MISCELLANEOUS\GINT\10812DAA BORING LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								15	30	45	60
								PL	MC	LL	
0		Asphalt	AU 1	100				15	30	45	60
		(SC) Clayey Sand, some gravel, brown, cobbles, very loose to loose, damp.									
		(Fill)	SS 2	33	2-4-2 (6)						
5		(SC) Clayey Sand, some gravel, brown, cobbles, very loose to loose, damp.									
		(Glaciofluvial)	SS 3	33	2-2-2 (4)						
		(SM) Silty Sand with Gravel, intermixed clay, tan, damp.	SS 4	67	8-50/0"						
		(Glaciofluvial)									
		Refusal at 8.0 feet. Bottom of borehole at 8.0 feet.									





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Appendix A: Soil Boring Logs



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BORING NUMBER B-17

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CLIENT Silver Rapids Lodge SPE, LLC**PROJECT NAME** Silver Rapids Lodge Geotechnical Investigation**PROJECT NUMBER** 10812DAA**PROJECT LOCATION** Ely, Lake County, Minnesota**DATE STARTED** 5/10/24**COMPLETED** 5/10/24**GROUND ELEVATION** 1412.89 ft**HOLE SIZE** 3 Inch**DRILLING CONTRACTOR** Range Environmental**LOCATION:****DRILLING METHOD** Direct Push/SPT Sampling**NORTHING** 5306394.86**LOGGED BY** A. Mattson**CHECKED BY** E. Johnson**EASTING** 593024.11**GROUNDWATER** ---**COORD SYS**

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲					
								15	30	45	60		
0		(SM) Silty Sand with Gravel, cobbles, brown, very loose, damp. (Glaciofluvial)	AU 1	100									
5			SS 2	17	2-2-1 (3)								
			SS 3	50	4-50/0"								
		Refusal at 6.0 feet. Bottom of borehole at 6.0 feet.											

PL MC LL

15 30 45 60

15 30 45 60

□ FINES CONTENT (%) □

20 40 60 80



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COORD SYS

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE ▲			
								15 30 45 60			
								PL MC LL			
0								15 30 45 60			
		(SM) Silty Sand with Gravel, cobble, gray to brown, very loose to loose, damp.	 AU 1	100							
		(Fill)	 SS 2	17	3-2-3 (5)						
5			 SS 3	17	3-2-2 (4)						
		(SM) Silty Sand, some gravel, tan, fine to medium grained, loose, damp.	 SS 4	56	3-4-4 (8)						
10		(Glaciofluvial)									
			 SS 5	67	4-4-4 (8)						
15		Bottom of borehole at 15.0 feet.									



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Descriptive Terminology of Soil
 Unified Soil Classification System (USCS)
 ASTM D2487/2488



Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests			SYMBOLS		TYPICAL DESCRIPTIONS
MAJOR DIVISIONS			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (Less than 5% fines)		GW	WELL-GRADED GRAVEL $C_u > 4$ and $1 < C_c < 5$
				GP	POORLY-GRADED GRAVELS $C_u < 4$ and/or $C_c < 1$ or $C_c > 5$
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (Greater than 12% fines)		GM	SILTY GRAVEL Fines classify as ML or MH
				GC	CLAYEY GRAVEL Fines Classify as CL or CH
	SAND AND SANDY SOILS	CLEAN SANDS (Less than 5% fines)		SW	WELL-GRADED SAND $C_u > 6$ and $1 < C_c < 5$
				SP	POORLY-GRADED SAND $C_u < 6$ and/or $C_c < 1$ or $C_c > 5$
FINE GRAINED SOILS	MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SANDS WITH FINES (Greater than 12% fines)		SM	SILTY SAND Fines classify as ML or MH
				SC	CLAYEY SAND Fines classify as CL or CH
	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	Silt $P_L < 4$ or plots below "A" Line
				CL	Lean Clay $P_L > 7$ and plots on or above "A" Line
		LIQUID LIMIT GREATER THAN 50		OL	ORGANIC SILT OR CLAY LL (oven dried)/ LL (not dried) < 0.75
				MH	Elastic Silt Plots below "A" Line
HIGHLY ORGANIC SOILS	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		CH	FAT CLAY P_L plots on or above "A" Line
				OH	ORGANIC CLAY OR SILT LL (oven dried)/ LL (not dried) < 0.75
				PT	PEAT

Particle Size Identification

Boulders.....over 12"
 Cobbles.....3" to 12"
 Gravel
 Coarse.....3/4" to 3"
 Fine.....No. 4 to 3/4"
 Sand
 Coarse.....No. 4 to No. 10
 Medium.....No. 10 to No. 40
 Fine.....No. 40 to No. 200
 Silt.....<No. 200, $P_L < 4$ or below "A" line
 Clay.....<No. 200, $P_L \geq 4$ and on or about "A" line

Relative Density of Cohesionless Soils

Very Loose.....0 to 4 BPF
 Loose.....5 to 10 BPF
 Medium Dense.....11 to 30 BPF
 Dense.....31 to 50 BPF
 Very Dense.....over 50 BPF

Consistency of Cohesive Soils

Very soft.....0 to 1 BPF
 Soft.....2 to 3 BPF
 Rather soft.....4 to 5 BPF
 Medium.....6 to 8 BPF
 Rather stiff.....9 to 12 BPF
 Stiff.....13 to 16 BPF
 Very stiff.....17 to 30 BPF
 Hard.....over 30 BPF

Relative Proportions

Trace.....0 to 5%
 Little.....6 to 14%
 With..... $\geq 15\%$

Soil Moisture Terms

Dry	Dr	No noticeable moisture
Damp	Da	Residual moisture noticeable
Moist	M	Below Saturation
Wet	W	Saturated
Water-Bearing	Wb	Porous soil below water

Water Level

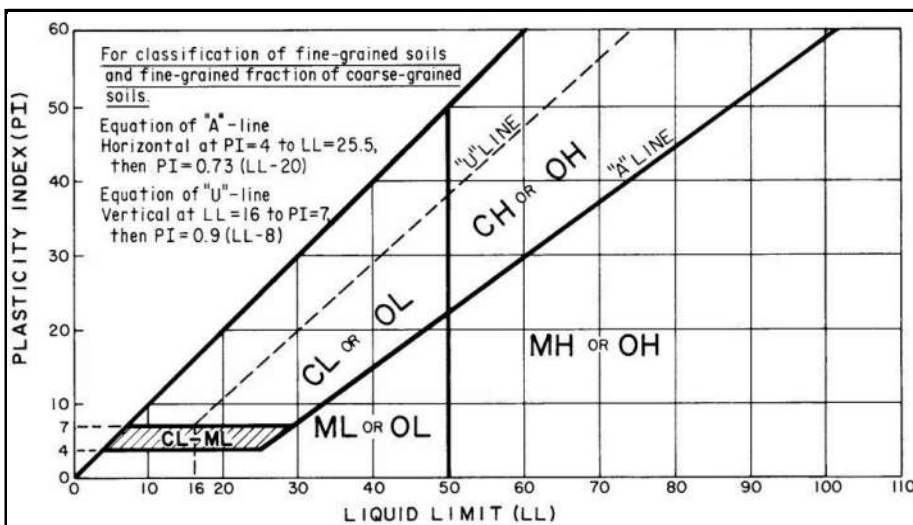
Water levels shown on the boring logs were determined at the time and under the conditions indicated.

Blow Count/N-Value

Blow counts indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Recovery

Indicates the inches of sample recovered from the sampled interval. For standard penetration test, full recovery is 18" unless noted on the boring logs.

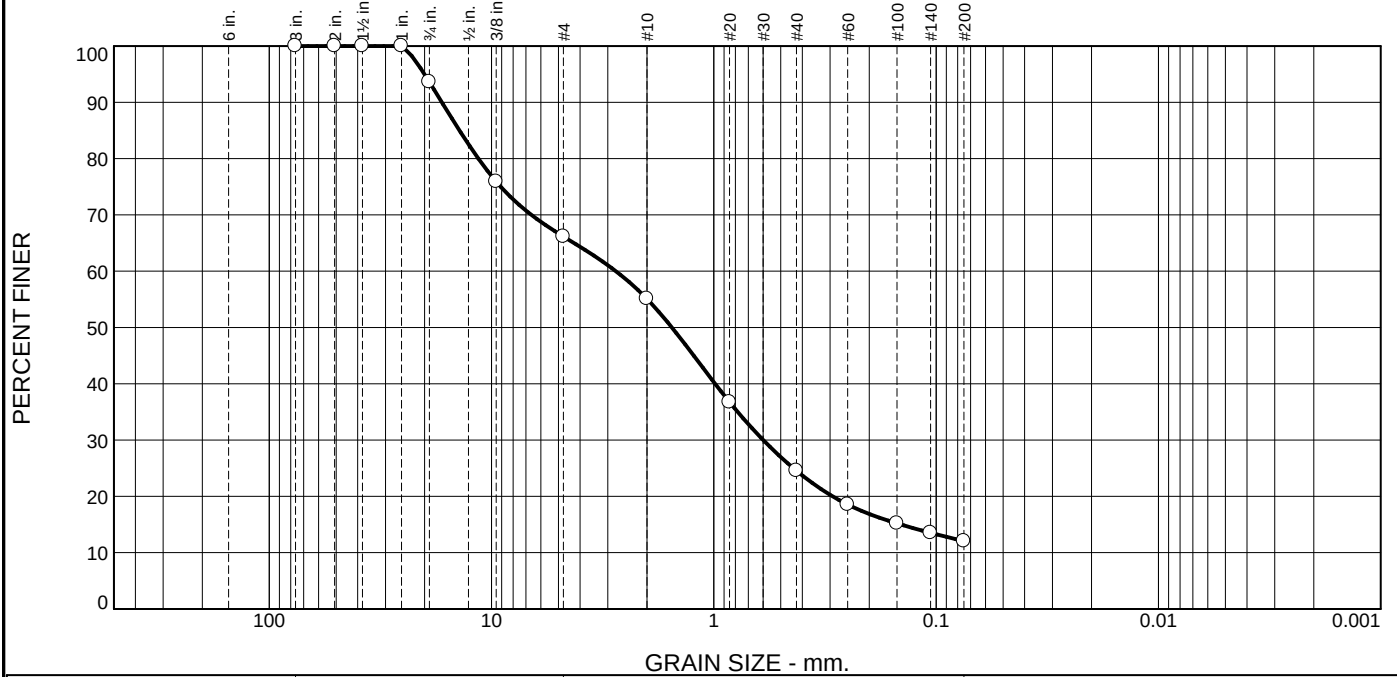


Appendix B

Laboratory Test Results

ASTM D7928 Hydrometer analyzed upon client request.

Grainsize Analysis



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.4	27.4	11.1	30.6	12.4	12.1	

Test Results (ASTM D 6913 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	93.6		
.375	75.9		
#4	66.2		
#10	55.1		
#20	36.7		
#40	24.5		
#60	18.5		
#100	15.2		
#140	13.5		
#200	12.1		

* (no specification provided)

Material Description

silty sand with gravel

Atterberg Limits (ASTM D 4318)

PL= NP

LL= NV

PI=

Classification

USCS (D 2487)= SM

AASHTO (M 145)= A-1-b

Coefficients

D₉₀= 16.7283

D₈₅= 13.9344

D₆₀= 2.7598

D₅₀= 1.5447

D₃₀= 0.6000

D₁₅= 0.1443

D₁₀=

C_u=

C_c=

Remarks

Water Content (ASTM D2216): 4.8%

Date Received: 5/14/2024

Date Tested: 5/23/2024

Tested By: RF

Checked By: A. Mattson

Title: Geological Engineer

Location: B-02 (2.5-5)

Sample Number: 500156-001

Date Sampled: 5/9/2024

Northeast Technical Services

Virginia, MN

Client: Iron Rock Development

Project: Silver Rapids Lodge Geotechnical Investigation

Project No: 10812DAA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

5/23/2024

Client: Iron Rock Development
Project: Silver Rapids Lodge Geotechnical Investigation
Project Number: 10812DAA
Location: B-02 (2.5-5)
Sample Number: 500156-001
Material Description: silty sand with gravel
Sample Date: 5/9/2024
Date Received: 5/14/2024 **PL:** NP **LL:** NV
USCS Classification: SM **AASHTO Classification:** A-1-b
Grain Size Test Method: ASTM D 6913
#200 Wash Method: ASTM C 117
Testing Remarks: Water Content (ASTM D2216): 4.8%
Tested By: RF **Test Date:** 5/23/2024
Checked By: A. Mattson **Title:** Geological Engineer

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
620.30	417.00	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1.5	0.00	0.00	100.0
		1	0.00	0.00	100.0
		.75	13.00	0.00	93.6
		.375	36.00	0.00	75.9
		#4	19.80	0.00	66.2
		#10	22.50	0.00	55.1
		#20	37.30	0.00	36.7
		#40	24.80	0.00	24.5
		#60	12.20	0.00	18.5
		#100	6.80	0.00	15.2
		#140	3.40	0.00	13.5
		#200	3.00	0.00	12.1

Fractional Components

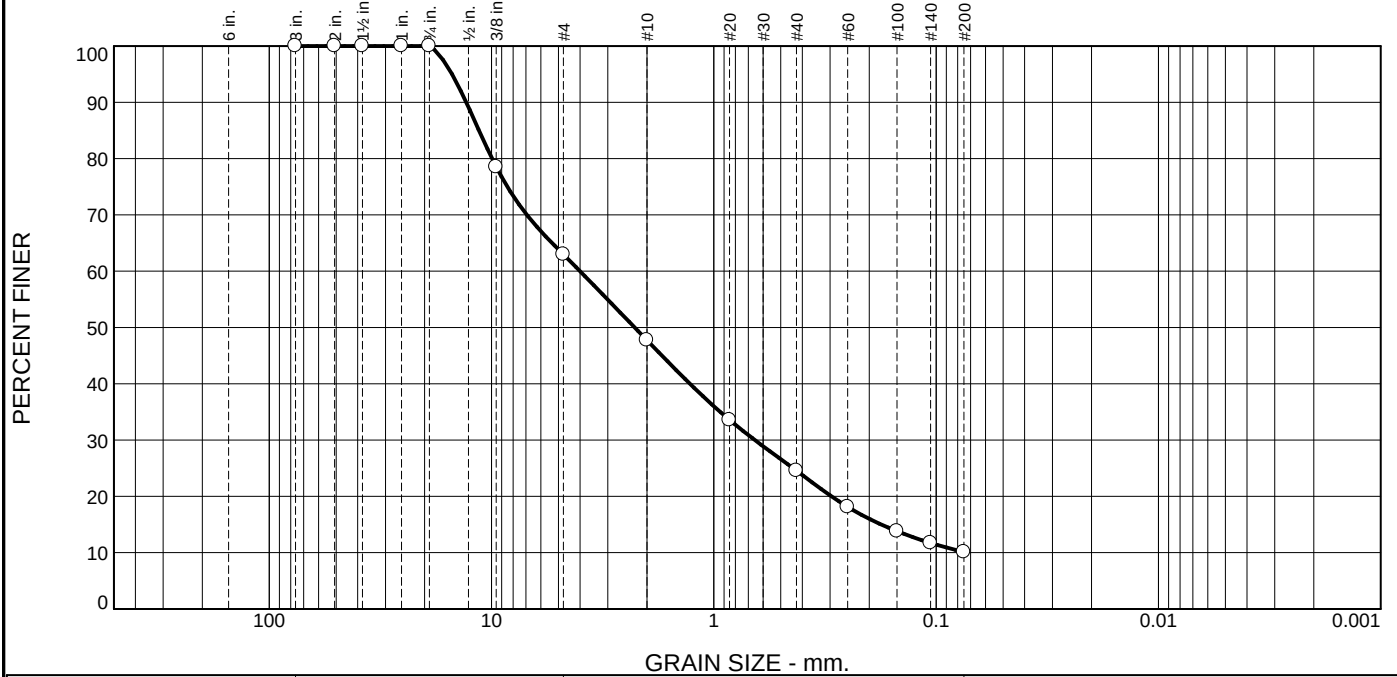
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	6.4	27.4	33.8	11.1	30.6	12.4	54.1			12.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.1443	0.2921	0.6000	0.9872	1.5447	2.7598	11.4573	13.9344	16.7283	20.0459

Fineness Modulus
3.97

ASTM D7928 Hydrometer analyzed upon client request.

Grainsize Analysis



GRAIN SIZE DISTRIBUTION TEST DATA

5/23/2024

Client: Iron Rock Development

Project: Silver Rapids Lodge Geotechnical Investigation

Project Number: 10812DAA

Location: B-08 (0-2.5)

Sample Number: 500156-005

Material Description: poorly graded sand with silt and gravel

Sample Date: 5/9/2024

Date Received: 5/14/2024 **PL:** NP

LL: NV

USCS Classification: SP-SM

AASHTO Classification: A-1-a

Grain Size Test Method: ASTM D 6913

#200 Wash Method: ASTM C 117

Testing Remarks: Water Content (ASTM D2216): 5.1%

Tested By: RF

Test Date: 5/23/2024

Checked By: A. Mattson

Title: Geological Engineer

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
875.10	527.80	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1.5	0.00	0.00	100.0
		1	0.00	0.00	100.0
		.75	0.00	0.00	100.0
		.375	74.60	0.00	78.5
		#4	54.00	0.00	63.0
		#10	52.90	0.00	47.7
		#20	49.20	0.00	33.6
		#40	31.30	0.00	24.6
		#60	22.40	0.00	18.1
		#100	14.90	0.00	13.8
		#140	7.30	0.00	11.7
		#200	5.60	0.00	10.1

Fractional Components

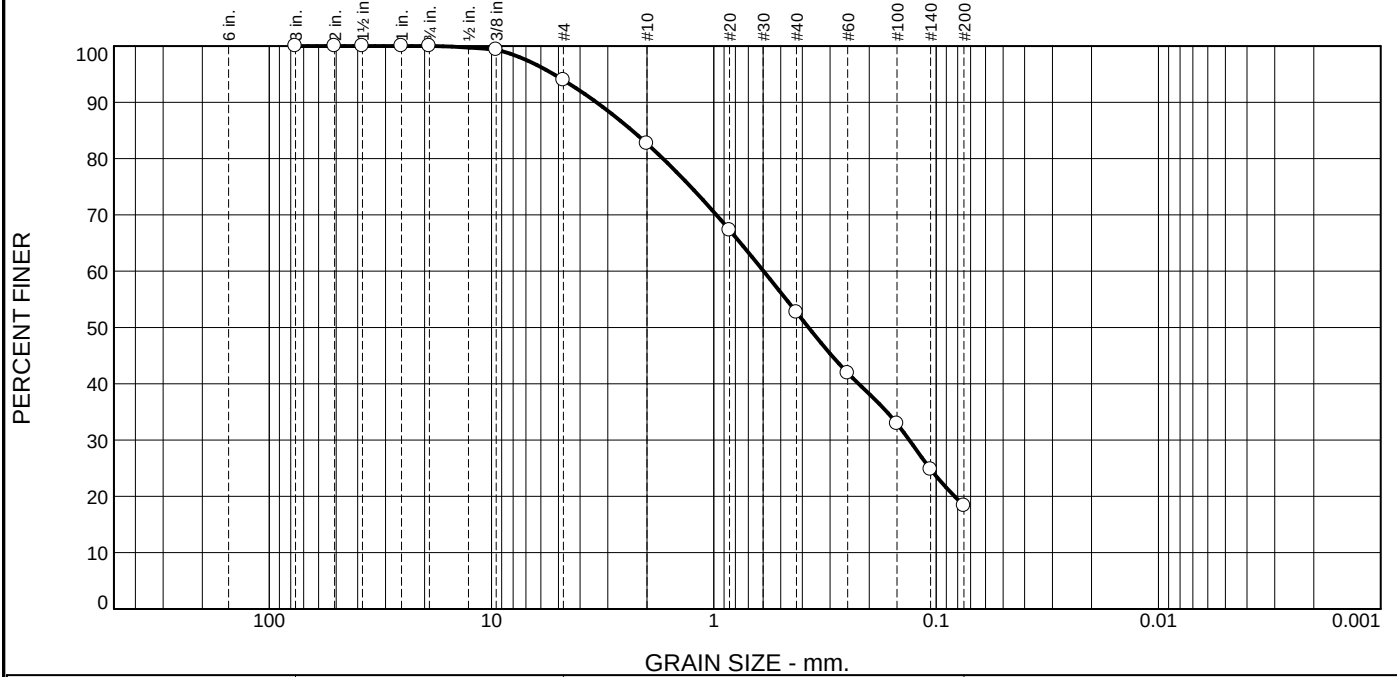
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	37.0	37.0	15.3	23.1	14.5	52.9			10.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.1767	0.2956	0.6539	1.2805	2.2717	4.0011	9.9459	11.3870	12.9991	15.0551

Fineness Modulus
4.06

ASTM D7928 Hydrometer analyzed upon client request.

Grainsize Analysis



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.1	11.2	30.0	34.4	18.3	

Test Results (ASTM D 6913 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	99.3		
#4	93.9		
#10	82.7		
#20	67.3		
#40	52.7		
#60	41.9		
#100	32.9		
#140	24.8		
#200	18.3		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP

LL= NV

PI=

Classification

USCS (D 2487)= SM

AASHTO (M 145)= A-2-4(0)

Coefficients

D₉₀= 3.3756

D₈₅= 2.3342

D₆₀= 0.5974

D₅₀= 0.3752

D₃₀= 0.1321

D₁₅=

D₁₀=

C_u=

C_c=

Remarks

Water Content (ASTM D2216): 10.7%

Date Received: 5/14/2024

Date Tested: 5/23/2024

Tested By: RF

Checked By: A. Mattson

Title: Geological Engineer

Location: B-12 (5-7.5)

Sample Number: 500156-004

Date Sampled: 5/10/2024

Northeast Technical Services

Virginia, MN

Client: Iron Rock Development

Project: Silver Rapids Lodge Geotechnical Investigation

Project No: 10812DAA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA**5/23/2024****Client:** Iron Rock Development**Project:** Silver Rapids Lodge Geotechnical Investigation**Project Number:** 10812DAA**Location:** B-12 (5-7.5)**Sample Number:** 500156-004**Material Description:** silty sand**Sample Date:** 5/10/2024**Date Received:** 5/14/2024 **PL:** NP**LL:** NV**USCS Classification:** SM**AASHTO Classification:** A-2-4(0)**Grain Size Test Method:** ASTM D 6913**#200 Wash Method:** ASTM C 117**Testing Remarks:** Water Content (ASTM D2216): 10.7%**Tested By:** RF**Test Date:** 5/23/2024**Checked By:** A. Mattson**Title:** Geological Engineer**Sieve Test Data**

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
896.40	515.10	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1.5	0.00	0.00	100.0
		1	0.00	0.00	100.0
		.75	0.00	0.00	100.0
		.375	2.50	0.00	99.3
		#4	20.60	0.00	93.9
		#10	43.00	0.00	82.7
		#20	58.60	0.00	67.3
		#40	55.70	0.00	52.7
		#60	41.10	0.00	41.9
		#100	34.30	0.00	32.9
		#140	30.90	0.00	24.8
		#200	24.70	0.00	18.3

Fractional Components

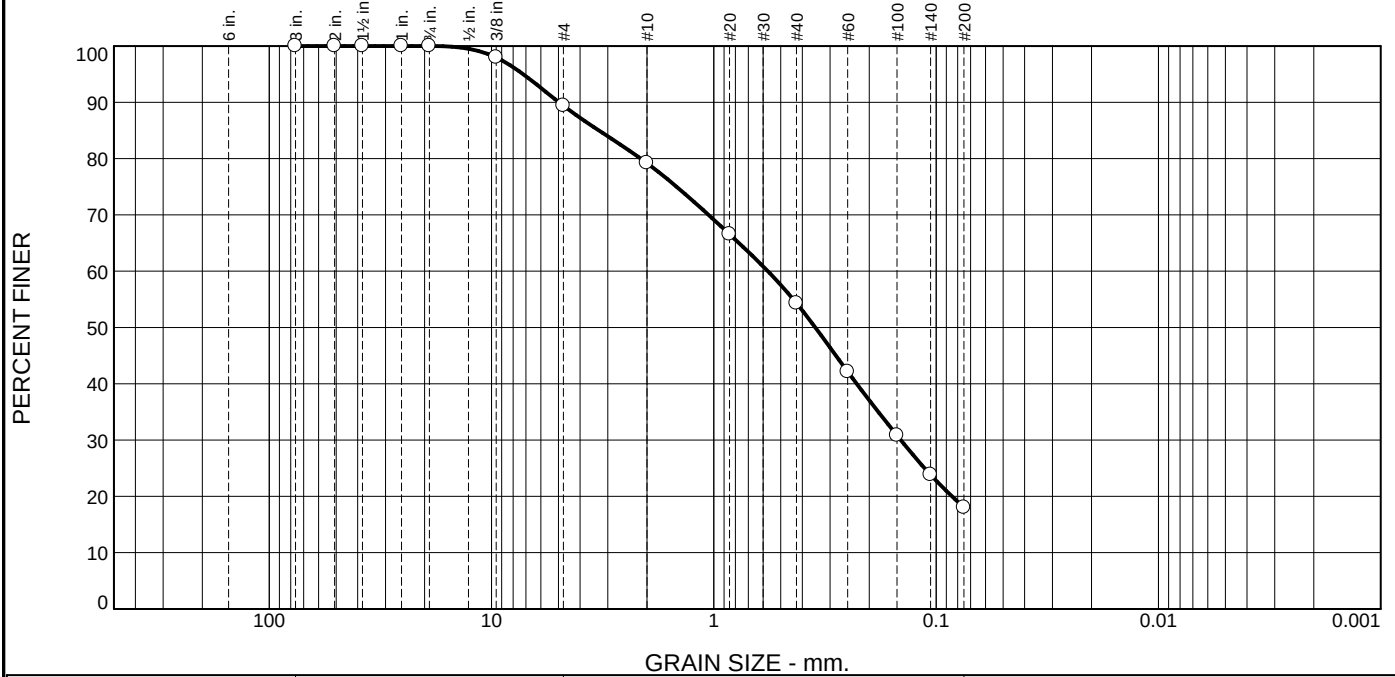
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	6.1	6.1	11.2	30.0	34.4	75.6			18.3

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0826	0.1321	0.2234	0.3752	0.5974	1.6948	2.3342	3.3756	5.2630

Fineness Modulus
2.10

ASTM D7928 Hydrometer analyzed upon client request.

Grainsize Analysis



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	10.6	10.2	24.9	36.3	18.0	

Test Results (ASTM D 6913 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	98.0		
#4	89.4		
#10	79.2		
#20	66.6		
#40	54.3		
#60	42.1		
#100	30.8		
#140	23.8		
#200	18.0		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP

LL= NV

PI=

Classification

USCS (D 2487)= SM

AASHTO (M 145)= A-2-4(0)

Coefficients

D₉₀= 4.9732

D₈₅= 3.2916

D₆₀= 0.5719

D₅₀= 0.3496

D₃₀= 0.1443

D₁₅=

D₁₀=

C_u=

C_c=

Remarks

Water Content (ASTM D2216): 10.1%

Date Received: 5/14/2024

Date Tested: 5/23/2024

Tested By: RF

Checked By: A. Mattson

Title: Geological Engineer

Location: B-17 (2.5-5)

Sample Number: 500156-003

Date Sampled: 5/10/2024

Northeast Technical Services

Virginia, MN

Client: Iron Rock Development

Project: Silver Rapids Lodge Geotechnical Investigation

Project No: 10812DAA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA**5/23/2024****Client:** Iron Rock Development**Project:** Silver Rapids Lodge Geotechnical Investigation**Project Number:** 10812DAA**Location:** B-17 (2.5-5)**Sample Number:** 500156-003**Material Description:** silty sand**Sample Date:** 5/10/2024**Date Received:** 5/14/2024 **PL:** NP**LL:** NV**USCS Classification:** SM**AASHTO Classification:** A-2-4(0)**Grain Size Test Method:** ASTM D 6913**#200 Wash Method:** ASTM C 117**Testing Remarks:** Water Content (ASTM D2216): 10.1%**Tested By:** RF**Test Date:** 5/23/2024**Checked By:** A. Mattson**Title:** Geological Engineer**Sieve Test Data**

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
704.90	533.30	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1.5	0.00	0.00	100.0
		1	0.00	0.00	100.0
		.75	0.00	0.00	100.0
		.375	3.50	0.00	98.0
		#4	14.70	0.00	89.4
		#10	17.50	0.00	79.2
		#20	21.70	0.00	66.6
		#40	21.00	0.00	54.3
		#60	20.90	0.00	42.1
		#100	19.40	0.00	30.8
		#140	12.00	0.00	23.8
		#200	10.00	0.00	18.0

Fractional Components

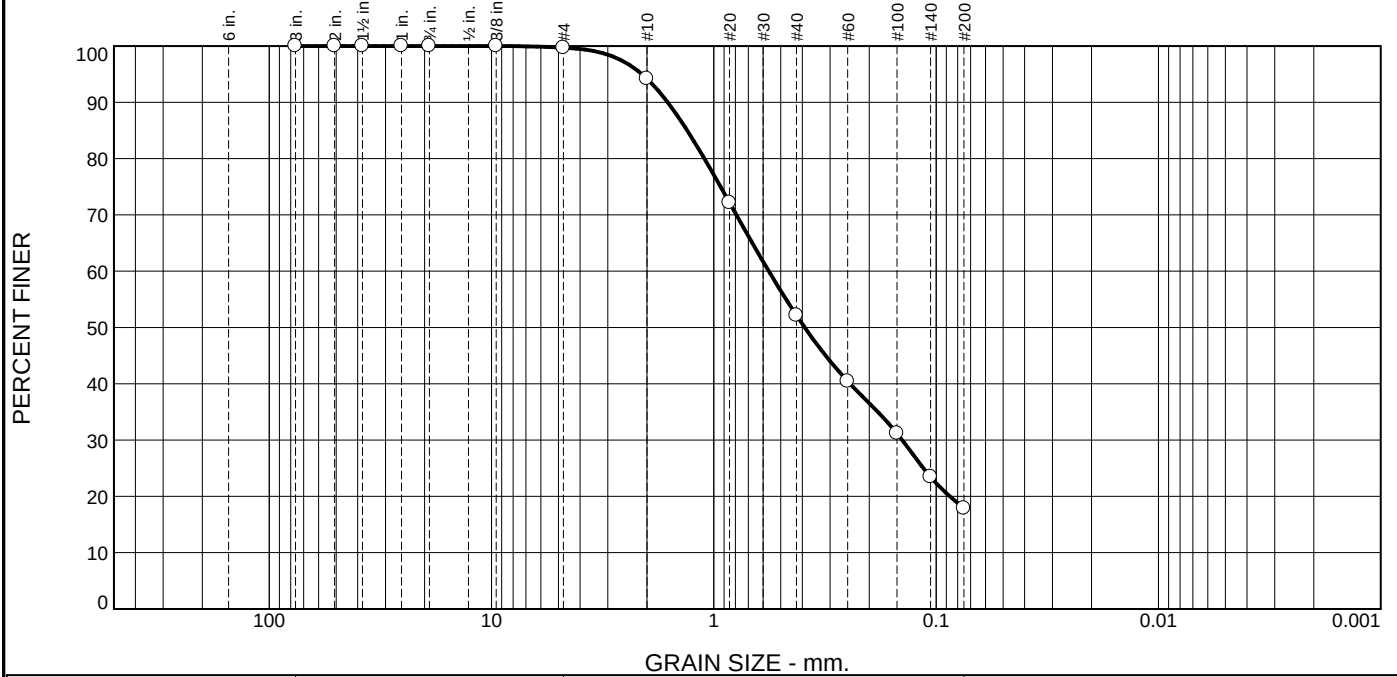
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	10.6	10.6	10.2	24.9	36.3	71.4			18.0

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0848	0.1443	0.2279	0.3496	0.5719	2.1331	3.2916	4.9732	7.2116

Fineness Modulus
2.22

ASTM D7928 Hydrometer analyzed upon client request.

Grainsize Analysis



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	5.5	42.1	34.2	17.9	

Test Results (ASTM D 6913 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	100.0		
#4	99.7		
#10	94.2		
#20	72.2		
#40	52.1		
#60	40.4		
#100	31.2		
#140	23.4		
#200	17.9		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP

LL= NV

PI=

Classification

USCS (D 2487)= SM

AASHTO (M 145)= A-2-4(0)

Coefficients

D₉₀= 1.6130

D₈₅= 1.3185

D₆₀= 0.5662

D₅₀= 0.3902

D₃₀= 0.1422

D₁₅=

D₁₀=

C_u=

C_c=

Remarks

Water Content (ASTM D2216): 11.4%

Date Received: 5/14/2024

Date Tested: 5/23/2024

Tested By: RF

Checked By: A. Mattson

Title: Geological Engineer

Location: B-18 (7.5-10)

Sample Number: 500156-002

Date Sampled: 5/10/2024

Northeast Technical Services

Virginia, MN

Client: Iron Rock Development

Project: Silver Rapids Lodge Geotechnical Investigation

Project No: 10812DAA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

5/23/2024

Client: Iron Rock Development

Project: Silver Rapids Lodge Geotechnical Investigation

Project Number: 10812DAA

Location: B-18 (7.5-10)

Sample Number: 500156-002

Material Description: silty sand

Sample Date: 5/10/2024

Date Received: 5/14/2024 **PL:** NP

LL: NV

USCS Classification: SM

AASHTO Classification: A-2-4(0)

Grain Size Test Method: ASTM D 6913

#200 Wash Method: ASTM C 117

Testing Remarks: Water Content (ASTM D2216): 11.4%

Tested By: RF

Test Date: 5/23/2024

Checked By: A. Mattson

Title: Geological Engineer

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
787.60	528.70	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1.5	0.00	0.00	100.0
		1	0.00	0.00	100.0
		.75	0.00	0.00	100.0
		.375	0.00	0.00	100.0
		#4	0.80	0.00	99.7
		#10	14.20	0.00	94.2
		#20	57.10	0.00	72.2
		#40	51.80	0.00	52.1
		#60	30.30	0.00	40.4
		#100	24.00	0.00	31.2
		#140	20.00	0.00	23.4
		#200	14.40	0.00	17.9

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	5.5	42.1	34.2	81.8			17.9

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0868	0.1422	0.2440	0.3902	0.5662	1.1035	1.3185	1.6130	2.1056

Fineness Modulus
1.85



MOISTURE REPORT

(ASTM D 2216)

Northeast Technical Services, Inc.
526 Chestnut Street, PO Box 1142
Virginia, Minnesota 55792
Telephone: (218) 741-4290

Project	Silver Rapids Lodge	Project #	10812DAA
Date Reported	5/23/2024	WO #	500156
Client	Iron Rock Development		
Sampled By	Range Environmental	Lab Technician	MW
Date Collected	5/9/24-5/10/24	Date Analyzed	5/22/2024
Sample Location	See Below		

Lab ID#	500156-006	Lab ID#	500156-007	Lab ID#	500156-008
Sample ID	B-19 (5-7.5)	Sample ID	B-13 (2.5-5)	Sample ID	B-06 (0-2.5)
Wet Weight (g)	662.7	Wet Weight (g)	628.1	Wet Weight (g)	501.7
Dry Weight (g)	610.1	Dry Weight (g)	605.1	Dry Weight (g)	478.5
Tare Weight (g)	272.8	Tare Weight (g)	273.8	Tare Weight (g)	275.2
Water Weight (g)	52.6	Water Weight (g)	23.0	Water Weight (g)	23.2
% Moisture	15.6	% Moisture	6.9	% Moisture	11.4

Lab ID#	500156-009	Lab ID#	500156-010	Lab ID#	500156-011
Sample ID	B-01 (2.5-5)	Sample ID	B-14 (7.5-10)	Sample ID	B-16 (2.5-5)
Wet Weight (g)	539.5	Wet Weight (g)	555.0	Wet Weight (g)	538.9
Dry Weight (g)	528.7	Dry Weight (g)	538.0	Dry Weight (g)	521.7
Tare Weight(g)	276.9	Tare Weight(g)	274.0	Tare Weight(g)	271.1
Water Weight (g)	10.8	Water Weight (g)	17.0	Water Weight (g)	17.2
% Moisture	4.3	% Moisture	6.4	% Moisture	6.9

Comments

Reviewed By: Allison Mattson



MOISTURE REPORT

(ASTM D 2216)

Northeast Technical Services, Inc.
526 Chestnut Street, PO Box 1142
Virginia, Minnesota 55792
Telephone: (218) 741-4290

Project	Silver Rapids Lodge	Project #	10812DAA
Date Reported	5/23/2024	WO #	500156
Client	Iron Rock Development		
Sampled By	Range Environmental	Lab Technician	MW
Date Collected	5/9/24-5/10/24	Date Analyzed	5/22/2024
Sample Location	See Below		

Lab ID#	500156-012	Lab ID#	500156-013	Lab ID#	500156-014
Sample ID	B-09 (0-2.5)	Sample ID	B-14 (2.5-5)	Sample ID	B-06 (12.5-15)
Wet Weight (g)	594.0	Wet Weight (g)	438.6	Wet Weight (g)	688.2
Dry Weight (g)	577.2	Dry Weight (g)	428.0	Dry Weight (g)	658.4
Tare Weight (g)	272.9	Tare Weight (g)	277.3	Tare Weight (g)	279.1
Water Weight (g)	16.8	Water Weight (g)	10.6	Water Weight (g)	29.8
% Moisture	5.5	% Moisture	7.0	% Moisture	7.9

Lab ID#		Lab ID#		Lab ID#	
Sample ID		Sample ID		Sample ID	
Wet Weight (g)		Wet Weight (g)		Wet Weight (g)	
Dry Weight (g)		Dry Weight (g)		Dry Weight (g)	
Tare Weight(g)		Tare Weight(g)		Tare Weight(g)	
Water Weight (g)		Water Weight (g)		Water Weight (g)	
% Moisture		% Moisture		% Moisture	

Comments

Reviewed By: Allison Mattson

Appendix E – Wetland Delineation Report



Consulting
Engineers and
Scientists

Wetland Delineation Report Silver Rapids Lodge

Lake County, Minnesota

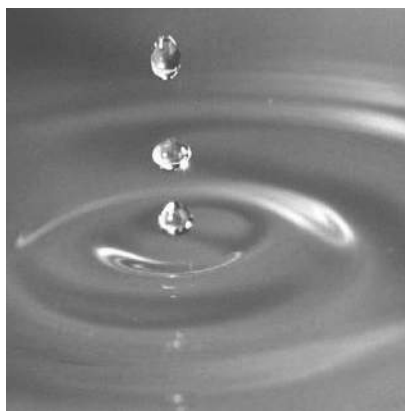
Submitted to:

Silver Rapids Resort, LLC
800B West Railroad Street
Duluth, MN 55802

Submitted by:

GEI Consultants, Inc.
1710 Mall Dr
Duluth, MN 55811

10/31/2023
Project 2305088



Rob Peterson, PG, PWS
MN Wetland Professional

Ken Kytta, PE
Vice President

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4. National Wetland Inventory & Public Waters Inventory

Appendices

- A. Antecedent Precipitation Tool
- B. Photo Log
- C. USACE Wetland Determination Data Forms
- D. USDA Soil Survey Information

RP:KK:

B:\Working\SILVER RAPIDS RESORT\2305088 Wetland Delineation\06_In_Progress\Reports\Silver Springs Resort Wetland Delineation Report.docx

1. Introduction

GEI Consultants, Inc. (GEI) completed a wetland delineation for Lake County parcel numbers 28-6311-32070 & 28-6311-29850 referred to as the Silver Rapids Lodge Property east of Ely, MN (Site). The Site is in Sections 29 and 32 of Township 63 North, Range 11 West in Lake County, Minnesota (Figure 1). The delineation area covers +/- 63 acres as shown in Figure 2. The primary land cover within the Site is undisturbed woodland and wetland in the north part, Silver Rapids Lodge in the south part with some gravel extraction in the western part. The southern and southeastern parcel limits are bounded by White Iron Lake. The surrounding land use is rural residential, undeveloped woodland, and wetland habitat.

The purpose of the wetland delineation was to identify wetland and other aquatic resource boundaries and classify the wetland plant community types. The delineation will be used to aid in project planning and to identify potential wetland and aquatic resource impacts.

2. Delineation Methodology

2.1 Wetlands

Wetlands are defined by the United States (U.S.) Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) as “*areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*” Wetlands present within the Site were identified and delineated using the procedures described in the *U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual* (Environmental Laboratory, Waterways Experiment Station, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (US Army Engineer Research and Development Center, 2011). These methods utilize the standard multi-parameter approach (vegetation, hydrology, and soils) for wetland identification as outlined in the *Corps of Engineers Wetland Determination Data Forms*. In general, an area is considered a wetland if hydrophytic vegetation, wetland hydrology, and hydric soils are present. Delineated wetlands were classified in accordance with the classification systems set forth in *Wetlands of the United States* (Shaw and Fredine, 1971), *Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), and *Wetland Plants and Plant Communities of Minnesota and Wisconsin* (Eggers and Reed, 2014).

2.2 Other Aquatic Resources

The wetland delineation includes other aquatic resources affected by regulated activities in waters of both the U.S. and Minnesota. The delineation area was specifically surveyed for wetlands (as defined under Section 404 of the Clean Water Act) and other aquatic resources such as seasonal ponds, seeps, springs, ditches, and streams (intermittent, ephemeral, and perennial). Other aquatic resources are identified and delineated as described in the *Guidance for Submittal of Delineation Reports to the St. Paul District Army Corps of Engineers and Wetland Conservation Act Local Governmental Units in Minnesota* (USACE, St. Paul District Regulatory, 2015). Observations and mapping of potential connections and flow paths between other aquatic resources and wetlands can provide information for determining regulatory jurisdiction.

2.3 Desktop Review

A desktop review was completed for the delineation area prior to the on-site data collection and field delineation by reviewing a variety of available information to identify potential wetlands and aquatic resources. Resources reviewed include:

- USACE Antecedent Precipitation Tool (USACE 2023)

- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2023)
- USGS Topographic Maps (USGS 2023)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) (USFWS 2023)
- Minnesota Department of Natural Resources (DNR) Public Waters Inventory (PWI) (DNR 2020)
- Aerial Imagery (USDA National Agricultural Imagery Program, Google Earth)
- DNR Hydrography Dataset (DNR 2022)
- DNR MNTPO Elevation Viewer and LiDAR Data (DNR 2023)

2.4 On-site Wetland Delineation

GEI's on-site wetland delineation followed the USACE procedure for identifying wetland boundaries by completing the appropriate number of sampling points, investigating the required wetland criteria, and identifying the boundary between wetland and upland areas. A soil sampling auger or tiling shovel was used to complete soil sampling points and check the soils and hydrology at periodic intervals throughout the delineated boundary to confirm accuracy and/or adjust the boundary accordingly. All wetland boundaries within the property were flagged with Wetland Delineation flagging tape and geolocated using a global positioning system (GPS) capable of sub-foot accuracy and incorporated into a geographic information system (GIS) using ArcGIS 10.8 GIS software. The Site GPS data is being used to aid in Site planning.

In addition to wetlands, waterbodies (lakes or ponds), waterways (streams, rivers, and ditches), and other aquatic resources (seeps and springs) within the area of investigation were assessed and mapped during fieldwork if present. The estimated top of bank of waterbodies or waterways were identified and geolocated with GPS as polylines or polygons. Seeps and springs were identified and mapped as points. Observations of the other aquatic resource characteristics were recorded.

The on-site data collection focused on completing sampling points within identified sampling units. Sampling units were distinguished by differences in landscape position, vegetation, soils, hydrology and/or disturbance relevant to the aquatic resource. GEI typically uses plant communities as the primary sampling units. Plant community units typically reflect spatial variations in geomorphology, hydrology, soils, and other factors that are important to the formation and maintenance of wetlands. Plant community units were identified during the desktop analysis and were adjusted based on observed field conditions. Sampling point locations within the plant community units were selected to be representative of the plant community. At least one sampling point and NCNE Supplement Data Form was completed in each plant community.

2.4.1 Normal Circumstances and Antecedent Precipitation

The on-site data collection activities occurred within the growing season as defined in the USACE Regional Supplement. GEI was on-site to conduct the wetland delineation on October 20th, 2023. Normal circumstances were observed during the time of the site visit. Antecedent precipitation data was obtained using the USACE Antecedent Precipitation Tool (APT) to determine if climatic/hydrologic conditions were considered dry, normal, or wet for the delineation area at the time of fieldwork. The APT reported antecedent precipitation conditions to be normal for the three months prior to the delineation. Normal conditions were reported over the last 30 days with 2.7 inches recorded since September 20th (Appendix A).

2.4.2 Vegetation

The vegetation occurring at representative sampling point locations was assessed to determine the dominant species in the tree, woody vine, sapling/shrub, and herbaceous vegetation strata. Vegetation plot sizes include a 30-foot radius for tree and woody vine strata, a 15-foot radius for sapling/shrub stratum, and a 5-foot radius for herbaceous stratum. Depending on the community size encountered at each sampling point, the plot size for the tree/vine/shrub/herb strata may be adjusted to restrict the sampled vegetation to the plant community being assessed. The percentage of absolute areal cover was visually estimated for each species within each plot and recorded on the NCNE Supplement Data Forms. Wetland indicator status was applied to each species from *The National Wetland Plant List: 2020 Wetland Rating* (USACE, 2020). The 50/20 rule was applied to determine dominant species within each stratum. The Rapid Test for Hydrophytic Vegetation, Dominance Test, and Prevalence Index was then be calculated, and a determination of the presence of hydrophytic vegetation was made.

2.4.3 Hydrology

Each sampling point was investigated for primary and secondary hydrology indicators listed on the NCNE Supplement Data Forms and as described in the USACE Wetlands Delineation Manual and Regional Supplement. Observations of surface water depth, depth to saturation and depth to water table were also be recorded. Observations of hydrology indicators were recorded on the NCNE Supplement Data Forms.

2.4.4 Soils

The presence or absence of hydric soils was assessed through use of a shovel or soil auger to observe and document the soil profile to a depth of at least 24 inches unless a restrictive layer is encountered, or a hydric soil indicator and hydrology are identified at a lesser depth. Soil profile descriptions of the hue, value, and chroma for each soil horizon were completed at each sampling point using Munsell soil color charts. The USDA NRCS soil texture, special features (e.g., redox concentrations, depletions, muck, sulfidic odor) along with horizon depths, were recorded for each soil horizon. Accepted field indicators (*NRCS 2018, Field Indicators of Hydric*

Soils in the United States, Version 8.2) were referenced to determine if the hydric soils technical criteria are met. Soil conditions and hydric soil indicators were recorded on the NCNE Supplement Data Forms for each sampling point.

3. Results

3.1 Wetlands

Three wetlands, Wetland A-C were identified within the delineation area.

Wetland A is primarily a Type 6 – Alder Thicket wetland plant community and covers 0.37 acres. Wetland A consists of two depressional basins hydrologically connected through drainage features and seepage. A ditch and linear wetland convey water from the gravel pit downslope to the first basin located on a slope break. Two culverts convey water from the first basin into the second basin located at a lower elevation to the east.

Hydrophytic vegetation criteria were met by the Dominance Test (>50% FAC, FACW, or OBL) and the Prevalence Index. The Wetland A sampling points met hydrology indicators A2 – High Water Table, A3 – Saturation, B9 – Water-stained Leaves, and D5 – FAC-Neutral Test. Hydric soil indicator A1 – Histosol was present. Wetland A was not identified on the PWI or NWI. The source of hydrology for Wetland A appears to be from precipitation and seepage.

Wetland A is located adjacent to the gravel pit. The southern part of Wetland A has been impacted by fill material and dumping of refuse. The extent of encroachment into Wetland A has not been evaluated but at least some portion of the fill is visible on the 2010-2012 LiDAR data.

Wetland B is a small Type 3 – Shallow Marsh wetland plant community covering 0.07 acres. Wetland B hydrophytic vegetation criteria were met by the Rapid Test, Dominance Test (>50% FAC, FACW, or OBL), and the Prevalence Index. The Wetland B sampling point met hydrology indicators A1 – Surface Water, A2 – High Water Table, A3 – Saturation, B9 – Water-stained Leaves, and D5 – FAC-Neutral Test. The hydric soil criteria was met by Other. The wetland appears to be very recent and hydric soils have not fully developed. The gravel was 100% iron stained. Hydric soils are assumed because of the presence of hydrophytic vegetation and hydrology criteria. Wetland B was not identified on the PWI or NWI. The source of hydrology for Wetland B appears to be from precipitation.

A review of aerial imagery indicates that Wetland B is likely an incidental wetland created by human activity. The 1991 Google Earth image shows this area as forested along the edge of a gravel road. This area is excavated for gravel extraction starting on the 2006 image. No soil wetland or wetland signatures are visible in the location of Wetland B on the 2006, 2008, 2009, or 2010 imagery. Inundation is visible on the 2012, 2013, 2020, and 2022 aerial images.

Wetland C is a primarily a Type 7 – Hardwood Swamp (5.7 acres) with some Type 6 - Alder Thicket (0.49 acres) in the southwest part. The Alder Thicket is located at the edge of the gravel pit. Some historic fill is present along the southern wetland edge. Wetland C hydrophytic

vegetation criteria were met by the Dominance Test (>50% FAC, FACW, or OBL) and the Prevalence Index. The Wetland C sampling points met hydrology indicators A2 – High Water Table, A3 – Saturation, B9 – Water-stained Leaves, C1 – Hydrogen Sulfide Odor, and D5 – FAC-Neutral Test. Hydric soil indicators A1 – Histosol, A11 – Depleted Below Dark Surface, and F1 – Loamy Mucky Mineral were present. The northeast part of Wetland C is classified on the NWI as FFO1D. White Iron Lake/Kawishiwi River are identified on the PWI. The source of hydrology for Wetland C appears to be from precipitation.

3.2 Other Aquatic Resources

3.2.1 Ditch

One ditch was present conveying water into Wetland A from the west side of the gravel pit access road through a culvert. The ditch appeared recently excavated and did not contain organic material accumulation or vegetation. Recent precipitation was flowing through the ditch at the time of the delineation.

3.3 Supporting Documentation

See Figure 2 for details on the wetland boundaries and sampling point locations, Figure 3 for the LiDAR Hillshade, and Figure 4 for the National Wetland Inventory and Public Waters Inventory. Photographs of select Site features are included in Appendix B. Specifics of observed vegetation, hydrology, and soil characteristics of the Site wetlands are included on the NCNE Supplement Data Forms in Appendix C. The soil survey map units and hydric soil classifications are included in Appendix D.

4. Reporting and Regulatory Concurrence

Based on GEI's best professional judgement, the delineated wetlands meet the criteria outlined in the USACE *Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. This Wetland Delineation Report requires submittal to the Local Government Unit (LGU) Technical Evaluation Panel (TEP) and USACE, along with a Minnesota Joint Application Form requesting delineation concurrence for review and approval.

The wetlands and other aquatic resources identified in this report may be subject to federal regulation under the jurisdiction of the USACE, state regulation under the Minnesota Wetland Conservation Act (WCA), and local jurisdiction under the local county, town, or city.

5. References

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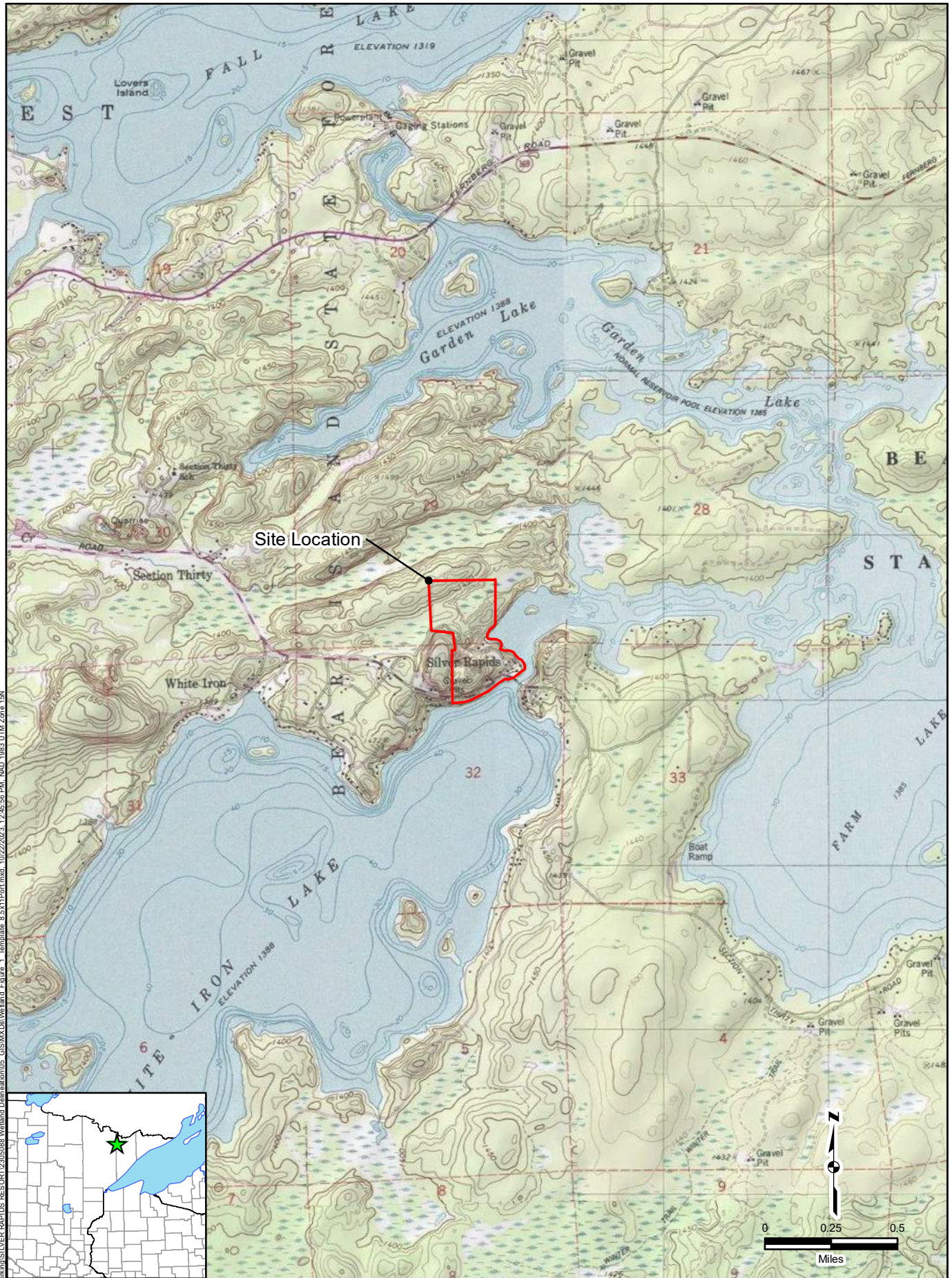
Figures

Figure 1 – Site Location

Figure 2 – Wetland Boundaries and Sample Point Locations

Figure 3 – Wetland Boundary, 2-Foot Contours, & LiDAR Hillshade

Figure 4 – National Wetland Inventory & Public Waters Inventory



GEI Office: Duluth, MN | Source: B:\Work\Silver Rapids Resort\23050888\Working\Deliverables\GIS\Map\Deliverables\GIS\Map\Deliverables\Map_1_Template_8.5x11Port.mxd, 10/22/2023, 12:46:56 PM, NAD 1983 UTM Zone 18N

Drawn: 10/22/2023
Service Layer Credits: USGS Topographical Maps



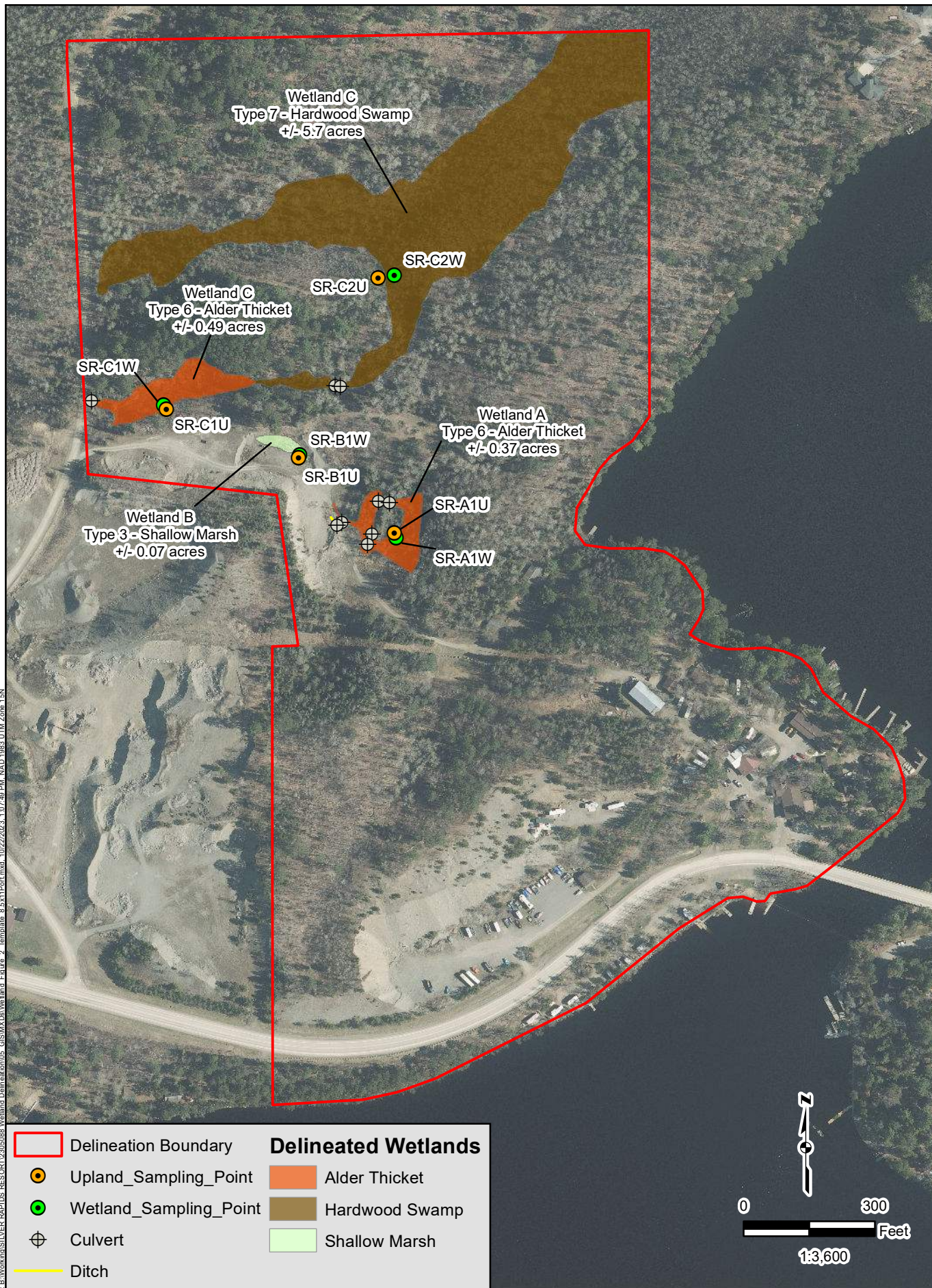
SILVER RAPIDS RESORT LAKE COUNTY, MINNESOTA

PREPARED FOR
SILVER RAPIDS RESORT, LLC

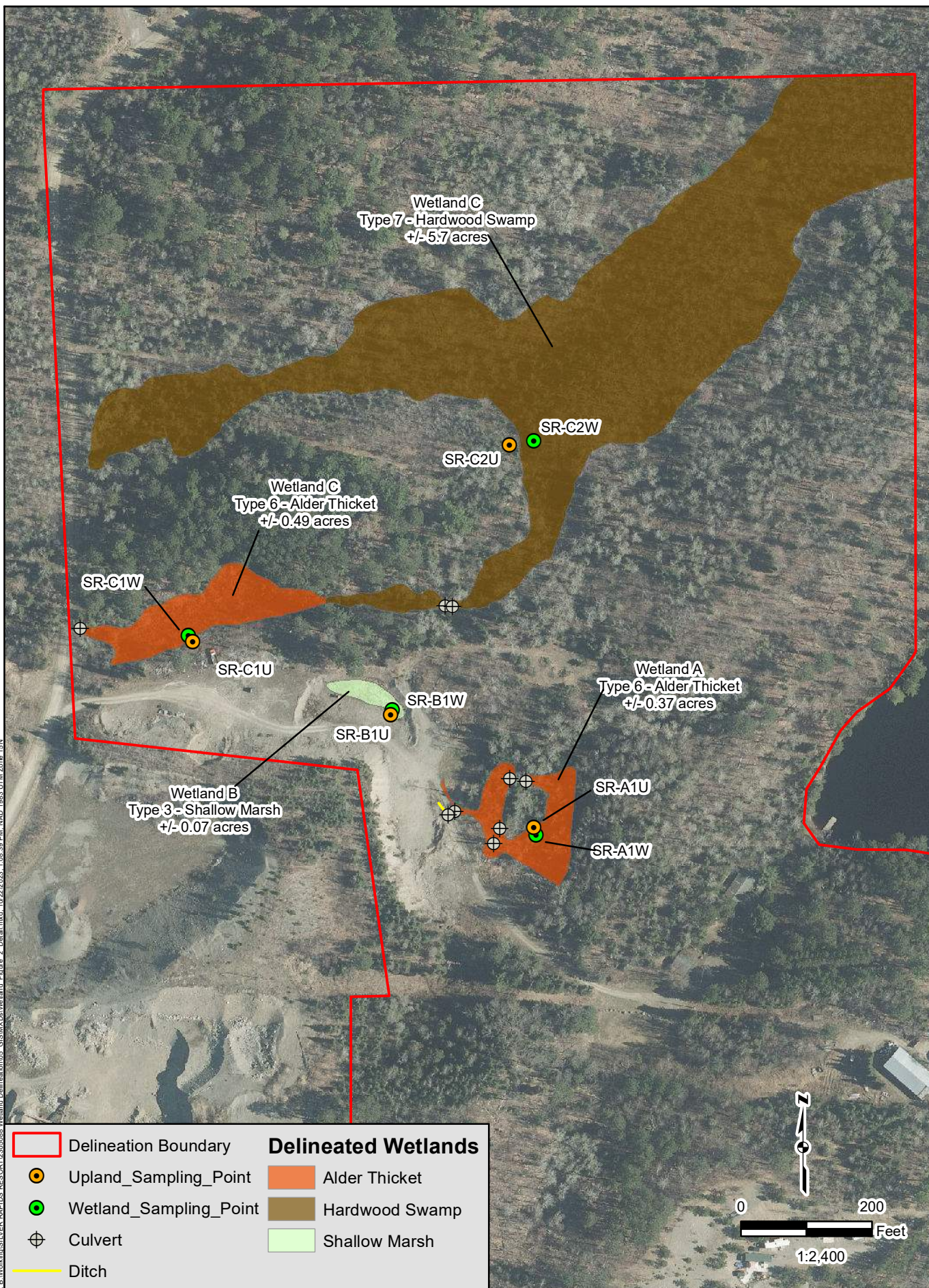
FIGURE 01

SITE LOCATION
OCTOBER, 2023

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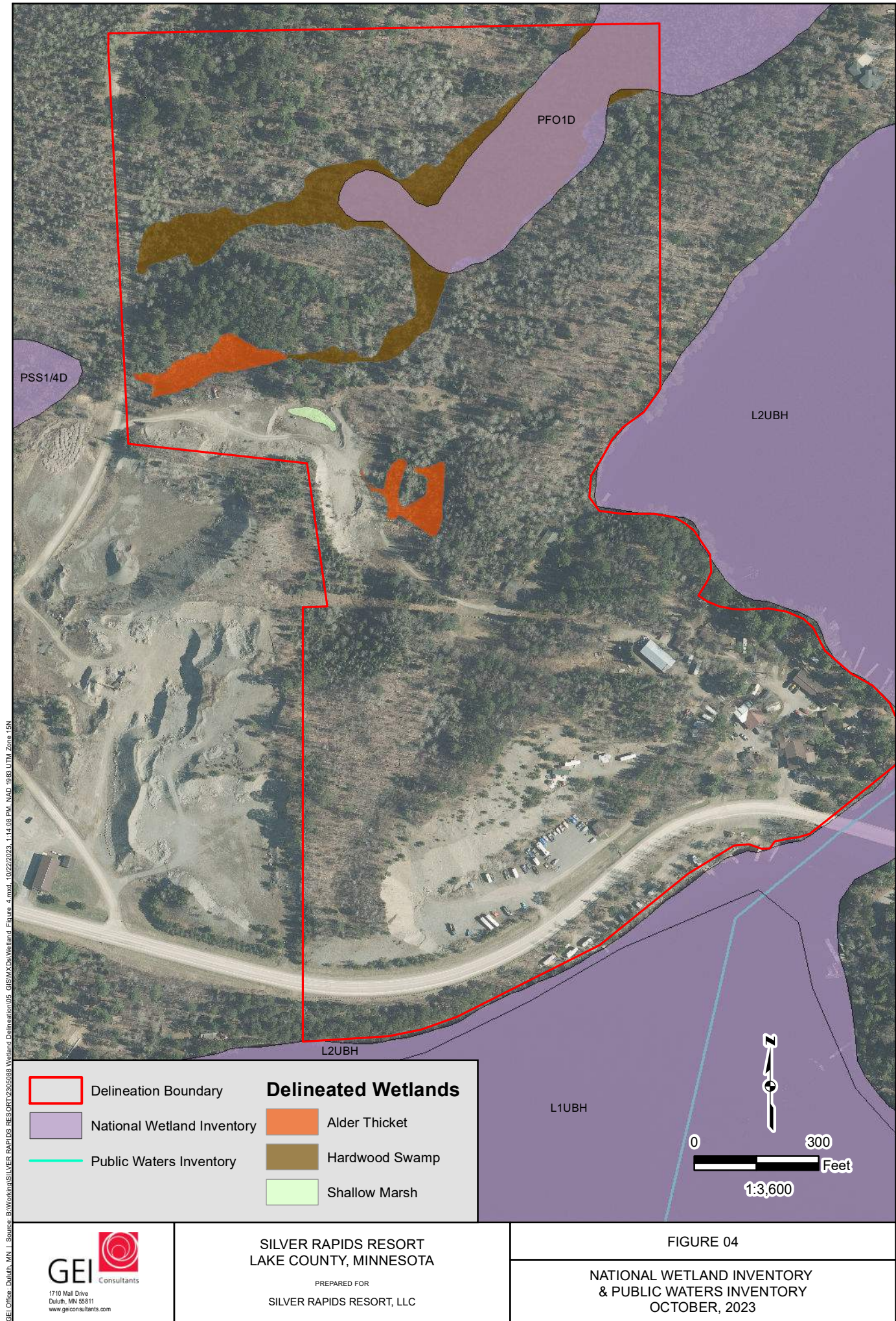
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	Delineation Boundary	Delineated Wetlands
	Alder Thicket	
	Hardwood Swamp	
	Shallow Marsh	

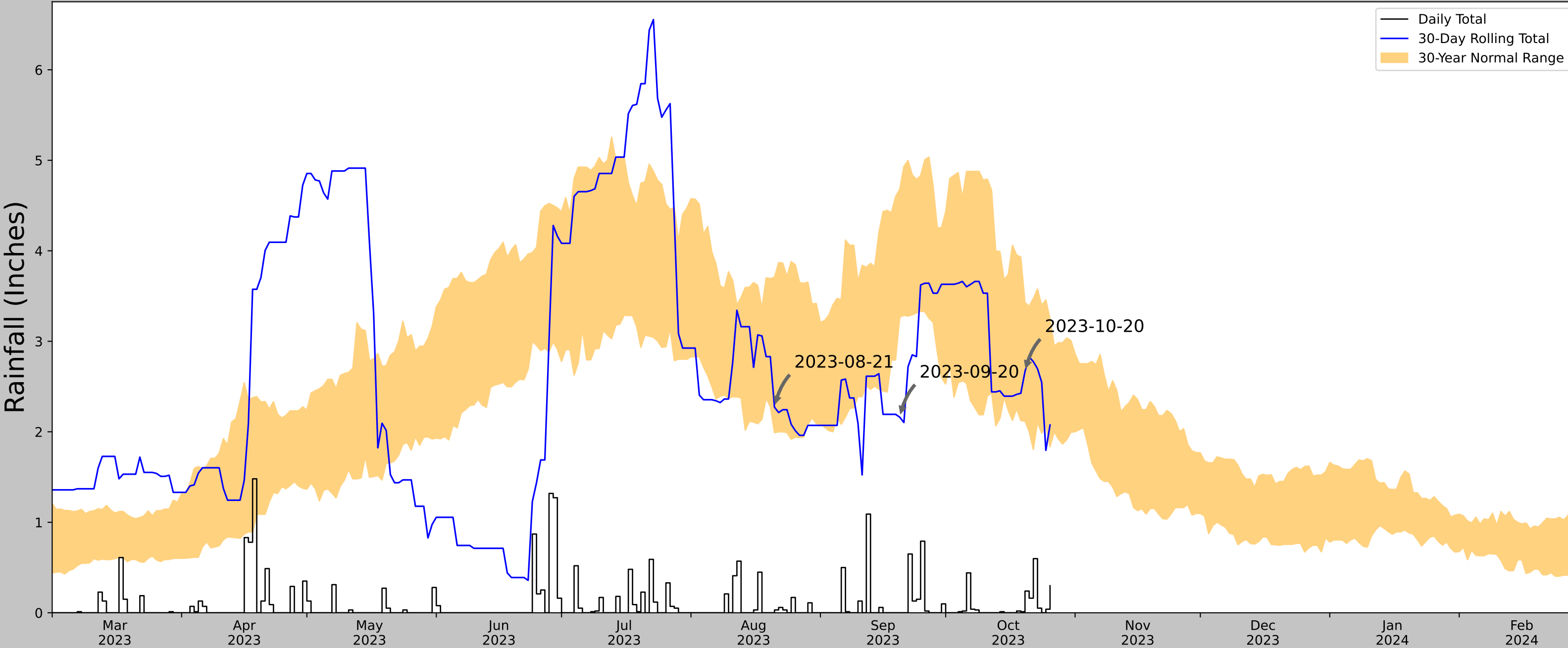


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Appendix A

Antecedent Precipitation Tool

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.905846, -91.758439
Observation Date	2023-10-20
Elevation (ft)	1406.585
Drought Index (PDSI)	Moderate drought (2023-09)
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-20	2.116929	3.428347	2.665354	Normal	2	3	6
2023-09-20	3.266142	4.680315	2.161417	Dry	1	2	2
2023-08-21	1.990551	3.707874	2.271654	Normal	2	1	2
Result							Normal Conditions - 10



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
ENGINEER RESEARCH & DEVELOPMENT CENTER

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELY 25E	47.9747, -91.4494	1435.039	15.075	28.454	7.212	8519	78
WINTON PWR PLT	47.9333, -91.7667	1336.942	14.959	98.097	8.199	966	0
ELY 8.1 SE	47.814, -91.7419	1416.011	17.519	19.028	8.217	48	2
WINTON 0.1 WSW	47.9276, -91.8028	1355.971	16.675	79.068	8.822	186	0
ELY	47.9056, -91.8283	1475.066	18.176	40.027	8.907	143	10
ELY	47.9239, -91.8586	1381.89	19.259	53.149	9.69	370	0
BABBITT	47.7122, -91.9533	1480.971	29.58	45.932	14.67	184	0
TOWER 2S	47.7817, -92.2783	1430.118	40.661	4.921	18.498	894	0
TOWER DNR	47.8003, -92.2867	1419.948	40.623	15.091	18.893	35	0
EMBARRASS	47.6431, -92.2264	1424.869	42.719	10.17	19.658	6	0
Linear Interpolation	N/A	N/A	N/A	N/A	N/A	1	0

Appendix B

Photo Log



Photo 1: SR-A1U, showing hardwood forest plant community upslope from Wetland A.



Photo 2: SR-A1W, showing seepage, surface water, and saturated conditions within Wetland A.



Photo 3:SR-B1U, showing upland plant community within gravel pit associated with Wetland B.



Photo 4:SR-B1W, showing Shallow Marsh within gravel borrow area within Wetland B.



Photo 5:SR-C1U, showing hardwood forest plant community upslope from Wetland C.



Photo 6:SR-C1W, showing Alder Thicket plant community within Wetland C.



Photo 7:SR-C2U, showing hardwood forest plant community upslope from Wetland C.



Photo 8:SR-C2W, showing Hardwood Swamp plant community within Wetland C.

Appendix C

USACE Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
 Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-A1U
 Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
 Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): Convex Slope (%): 8-15
 Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.905748 Long: -91.758566 Datum: WGS84
 Soil Map Unit Name: Pits, gravel-Udipsamments complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil ☒, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes _____ No ☒ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
☐ Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes _____ No ☒ Depth (inches): _____ Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No indicators of wetland hydrology were observed.		

VEGETATION – Use scientific names of plants.

 Sampling Point: SR-A1U

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Acer rubrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80.00</u> (A/B)														
2. <u>Abies balsamea</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>5</u>	<u>N</u>	<u>FACU</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>35.0</u> = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0.00</u></td> <td>x 1 = <u>0.00</u></td> </tr> <tr> <td>FACW species <u>0.00</u></td> <td>x 2 = <u>0.00</u></td> </tr> <tr> <td>FAC species <u>70.00</u></td> <td>x 3 = <u>210.00</u></td> </tr> <tr> <td>FACU species <u>15.00</u></td> <td>x 4 = <u>60.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>85.00</u> (A)</td> <td><u>270.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.18</u>	Total % Cover of:	Multiply by:	OBL species <u>0.00</u>	x 1 = <u>0.00</u>	FACW species <u>0.00</u>	x 2 = <u>0.00</u>	FAC species <u>70.00</u>	x 3 = <u>210.00</u>	FACU species <u>15.00</u>	x 4 = <u>60.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>85.00</u> (A)	<u>270.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0.00</u>	x 1 = <u>0.00</u>																	
FACW species <u>0.00</u>	x 2 = <u>0.00</u>																	
FAC species <u>70.00</u>	x 3 = <u>210.00</u>																	
FACU species <u>15.00</u>	x 4 = <u>60.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>85.00</u> (A)	<u>270.00</u> (B)																	
<u>20.0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Sambucus racemosa</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Acer rubrum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>20.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Athyrium angustum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes ☒ No _____														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>30.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.) Vegetation criteria met by FAC species. No FACW or OBL species were present at sampling point.																		

SOIL

Sampling Point: SR-A14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,
☐ Histic Epipedon (A2)	MLRA 149B)
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (LRR K, L)
☐ Stratified Layers (A5)	☐ Loamy Gleyed Matrix (F2)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)
☐ Sandy Redox (S5)	
☐ Stripped Matrix (S6)	
☐ Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric Soil Present? Yes _____ No ☒

Remarks:

Naturally problematic red parent material soils are present.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
 Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-A1W
 Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
 Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.905846 Long: -91.758439 Datum: WGS84
 Soil Map Unit Name: Pits, gravel-Udipsamments complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ☒
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes ☒ No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes ☒ No _____	
Wetland Hydrology Present? Yes ☒ No _____	
Remarks: (Explain alternative procedures here or in a separate report.) Alder Thicket. Historic dumping on southwest end of wetland. Groundwater seepage entering SW end of wetland basin. Southwest part of wetland is disturbed from aggregate mining and land use. The extent of disturbance is unknown and may be permitted under aggregate mining land use permits.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
☐ Surface Water (A1) ☒ High Water Table (A2) ☒ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Sparsely Vegetated Concave Surface (B8)	☒ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes ☒ No _____ Depth (inches): <u>2</u> Saturation Present? Yes ☒ No _____ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: 3 inches of surface water present within 5 feet of soil boring.		

VEGETATION – Use scientific names of plants.

 Sampling Point: **SR-A1W**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Fraxinus nigra</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)														
2. <u>Abies balsamea</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>40.0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Alnus incana</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0.00</u></td> <td>x 1 = <u>0.00</u></td> </tr> <tr> <td>FACW species <u>90.00</u></td> <td>x 2 = <u>180.00</u></td> </tr> <tr> <td>FAC species <u>20.00</u></td> <td>x 3 = <u>60.00</u></td> </tr> <tr> <td>FACU species <u>0.00</u></td> <td>x 4 = <u>0.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>110.00</u> (A)</td> <td><u>240.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.18</u>	Total % Cover of:	Multiply by:	OBL species <u>0.00</u>	x 1 = <u>0.00</u>	FACW species <u>90.00</u>	x 2 = <u>180.00</u>	FAC species <u>20.00</u>	x 3 = <u>60.00</u>	FACU species <u>0.00</u>	x 4 = <u>0.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>110.00</u> (A)	<u>240.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0.00</u>	x 1 = <u>0.00</u>																	
FACW species <u>90.00</u>	x 2 = <u>180.00</u>																	
FAC species <u>20.00</u>	x 3 = <u>60.00</u>																	
FACU species <u>0.00</u>	x 4 = <u>0.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>110.00</u> (A)	<u>240.00</u> (B)																	
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>40.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Mitella nuda</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☒ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Rubus pubescens</u>	<u>5</u>	<u>N</u>	<u>FACW</u>															
3. <u>Dryopteris carthusiana</u>	<u>3</u>	<u>N</u>	<u>FACW</u>															
4. <u>Equisetum sylvaticum</u>	<u>2</u>	<u>N</u>	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>30.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.) Bryophytes 50%, bare ground 20%																		

SOIL

Sampling Point: SR-A1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☒	Histosol (A1)	☐
☐	Histic Epipedon (A2)	☐
☐	Black Histic (A3)	☐
☐	Hydrogen Sulfide (A4)	☐
☐	Stratified Layers (A5)	☐
☐	Depleted Below Dark Surface (A11)	☐
☐	Thick Dark Surface (A12)	☐
☐	Sandy Mucky Mineral (S1)	☐
☐	Sandy Gleyed Matrix (S4)	☐
☐	Sandy Redox (S5)	☐
☐	Stripped Matrix (S6)	☐
☐	Dark Surface (S7) (LRR R, MLRA 149B)	☐

- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric Soil Present? Yes ✓ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-B1U
Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): Convex Slope (%): 3-7
Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.906346 Long: -91.759272 Datum: WGS84
Soil Map Unit Name: Pits, gravel-Udipsamments complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil ☒, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Sampling point completed within a gravel pit. Wetland characteristics have developed within a depression.	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Water-Stained Leaves (B9)	_____ Drainage Patterns (B10)
_____ High Water Table (A2)	_____ Aquatic Fauna (B13)	_____ Moss Trim Lines (B16)
_____ Saturation (A3)	_____ Marl Deposits (B15)	_____ Dry-Season Water Table (C2)
_____ Water Marks (B1)	_____ Hydrogen Sulfide Odor (C1)	_____ Crayfish Burrows (C8)
_____ Sediment Deposits (B2)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Drift Deposits (B3)	_____ Presence of Reduced Iron (C4)	_____ Stunted or Stressed Plants (D1)
_____ Algal Mat or Crust (B4)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Geomorphic Position (D2)
_____ Iron Deposits (B5)	_____ Thin Muck Surface (C7)	_____ Shallow Aquitard (D3)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Other (Explain in Remarks)	_____ Microtopographic Relief (D4)
_____ Sparsely Vegetated Concave Surface (B8)		_____ FAC-Neutral Test (D5)
Field Observations:		Wetland Hydrology Present? Yes _____ No ☒
Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes _____ No ☒ Depth (inches): _____ Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No indicators of wetland hydrology were observed.		

VEGETATION – Use scientific names of plants.

 Sampling Point: SR-B1U

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Betula papyrifera</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.00</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>5.0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Betula papyrifera</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0.00</u></td> <td>x 1 = <u>0.00</u></td> </tr> <tr> <td>FACW species <u>3.00</u></td> <td>x 2 = <u>6.00</u></td> </tr> <tr> <td>FAC species <u>0.00</u></td> <td>x 3 = <u>0.00</u></td> </tr> <tr> <td>FACU species <u>95.00</u></td> <td>x 4 = <u>380.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>98.00</u> (A)</td> <td><u>386.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.94</u>	Total % Cover of:	Multiply by:	OBL species <u>0.00</u>	x 1 = <u>0.00</u>	FACW species <u>3.00</u>	x 2 = <u>6.00</u>	FAC species <u>0.00</u>	x 3 = <u>0.00</u>	FACU species <u>95.00</u>	x 4 = <u>380.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>98.00</u> (A)	<u>386.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0.00</u>	x 1 = <u>0.00</u>																	
FACW species <u>3.00</u>	x 2 = <u>6.00</u>																	
FAC species <u>0.00</u>	x 3 = <u>0.00</u>																	
FACU species <u>95.00</u>	x 4 = <u>380.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>98.00</u> (A)	<u>386.00</u> (B)																	
2. <u>Salix bebbiana</u>	<u>3</u>	<u>N</u>	<u>FACW</u>															
3. <u>Pinus resinosa</u>	<u>3</u>	<u>N</u>	<u>FACU</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>21.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Lotus corniculatus</u>	<u>70</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☐ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Tanacetum vulgare</u>	<u>2</u>	<u>N</u>	<u>FACU</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>72.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <u>✓</u>														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SR-B14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,
☐ Histic Epipedon (A2)	MLRA 149B)
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (LRR K, L)
☐ Stratified Layers (A5)	☐ Loamy Gleyed Matrix (F2)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)
☐ Sandy Redox (S5)	
☐ Stripped Matrix (S6)	
☐ Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: cobbles

Depth (inches): 12

Hydric Soil Present? Yes _____ No ✓

Remarks:

Soils are disturbed from excavation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
 Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-B1W
 Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.906328 Long: -91.759331 Datum: WGS84
 Soil Map Unit Name: Pits, gravel-Udipsamments complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil ☒, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____ Hydric Soil Present? Yes ☒ No _____ Wetland Hydrology Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes ☒ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Sampling point completed within a gravel pit. Wetland characteristics have developed within a depression. Gravel pit wetland appears recent based on lack of soil development but has been present long enough for hydrophytic vegetation to develop.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☒ Water-Stained Leaves (B9) ☒ High Water Table (A2) ☐ Aquatic Fauna (B13) ☒ Saturation (A3) ☐ Marl Deposits (B15) ☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1) ☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4) ☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks) ☐ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No _____ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No _____ Depth (inches): <u>0</u> Saturation Present? Yes ☒ No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION – Use scientific names of plants.

 Sampling Point: SR-B1W

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>0</u> = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>100.00</u></td> <td>x 1 = <u>100.00</u></td> </tr> <tr> <td>FACW species <u>0.00</u></td> <td>x 2 = <u>0.00</u></td> </tr> <tr> <td>FAC species <u>0.00</u></td> <td>x 3 = <u>0.00</u></td> </tr> <tr> <td>FACU species <u>0.00</u></td> <td>x 4 = <u>0.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>100.00</u> (A)</td> <td><u>100.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.0</u>	Total % Cover of:	Multiply by:	OBL species <u>100.00</u>	x 1 = <u>100.00</u>	FACW species <u>0.00</u>	x 2 = <u>0.00</u>	FAC species <u>0.00</u>	x 3 = <u>0.00</u>	FACU species <u>0.00</u>	x 4 = <u>0.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>100.00</u> (A)	<u>100.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>100.00</u>	x 1 = <u>100.00</u>																	
FACW species <u>0.00</u>	x 2 = <u>0.00</u>																	
FAC species <u>0.00</u>	x 3 = <u>0.00</u>																	
FACU species <u>0.00</u>	x 4 = <u>0.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>100.00</u> (A)	<u>100.00</u> (B)																	
<u>0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Typha angustifolia</u>	<u>100</u>	<u>Y</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: ☒ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☒ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>100.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SR-B1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,
☐ Histic Epipedon (A2)	MLRA 149B)
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (LRR K, L)
☐ Stratified Layers (A5)	☐ Loamy Gleyed Matrix (F2)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)
☐ Sandy Redox (S5)	
☐ Stripped Matrix (S6)	
☐ Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric Soil Present? Yes ✓ No

Remarks:

Iron stained gravel

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
 Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-C1U
 Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
 Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): Convex Slope (%): 8-15
 Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.906551 Long: -91.760592 Datum: WGS84
 Soil Map Unit Name: Pits, gravel-Udipsamments complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil ☒, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Hardwood Forest at edge of gravel pit and upslope from Alder Thicket wetland. Aggregate mining spoils at edge of wetland.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
☐ Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes _____ No ☒ Depth (inches): _____ Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No indicators of wetland hydrology were observed.		

VEGETATION – Use scientific names of plants.

 Sampling Point: **SR-C1U**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Betula papyrifera</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.00</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>10.0</u> = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0.00</u></td> <td>x 1 = <u>0.00</u></td> </tr> <tr> <td>FACW species <u>20.00</u></td> <td>x 2 = <u>40.00</u></td> </tr> <tr> <td>FAC species <u>22.00</u></td> <td>x 3 = <u>66.00</u></td> </tr> <tr> <td>FACU species <u>25.00</u></td> <td>x 4 = <u>100.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>67.00</u> (A)</td> <td><u>206.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.07</u>	Total % Cover of:	Multiply by:	OBL species <u>0.00</u>	x 1 = <u>0.00</u>	FACW species <u>20.00</u>	x 2 = <u>40.00</u>	FAC species <u>22.00</u>	x 3 = <u>66.00</u>	FACU species <u>25.00</u>	x 4 = <u>100.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>67.00</u> (A)	<u>206.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0.00</u>	x 1 = <u>0.00</u>																	
FACW species <u>20.00</u>	x 2 = <u>40.00</u>																	
FAC species <u>22.00</u>	x 3 = <u>66.00</u>																	
FACU species <u>25.00</u>	x 4 = <u>100.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>67.00</u> (A)	<u>206.00</u> (B)																	
<u>34.0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Alnus incana</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>															
2. <u>Sambucus racemosa</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>															
3. <u>Pinus strobus</u>	<u>2</u>	<u>N</u>	<u>FACU</u>															
4. <u>Abies balsamea</u>	<u>2</u>	<u>N</u>	<u>FAC</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>34.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Rubus idaeus</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☐ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Tanacetum vulgare</u>	<u>3</u>	<u>N</u>	<u>FACU</u>															
3. <u>Valerian officinalis</u>	<u>2</u>	<u>N</u>	<u>NI</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>25.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No ☒														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		

Remarks: (Include photo numbers here or on a separate sheet.)
Alder exhibiting upright growth form.

SOIL

Sampling Point: SR-C14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,
☐ Histic Epipedon (A2)	MLRA 149B)
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (LRR K, L)
☐ Stratified Layers (A5)	☐ Loamy Gleyed Matrix (F2)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)
☐ Sandy Redox (S5)	
☐ Stripped Matrix (S6)	
☐ Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric Soil Present? Yes _____ No ☒

Remarks:

Soils disturbed from aggregate mining.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
 Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-C1W
 Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.906637 Long: -91.760579 Datum: WGS84
 Soil Map Unit Name: Pits, gravel-Udipsamments complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes ☒ No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes ☒ No _____	
Wetland Hydrology Present? Yes ☒ No _____	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Alder Thicket.</u>	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)
☒ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)
☒ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)
☐ Water Marks (B1)	☒ Hydrogen Sulfide Odor (C1)	☐ Dry-Season Water Table (C2)
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Crayfish Burrows (C8)
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)
		☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes ☒ No _____ Depth (inches): <u>4</u> Saturation Present? Yes ☒ No _____ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: **SR-C1W**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Abies balsamea</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80.00</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>3</u>	<u>Y</u>	<u>FACU</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>8.0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Alnus incana</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>10.00</u></td> <td>x 1 = <u>10.00</u></td> </tr> <tr> <td>FACW species <u>112.00</u></td> <td>x 2 = <u>224.00</u></td> </tr> <tr> <td>FAC species <u>10.00</u></td> <td>x 3 = <u>30.00</u></td> </tr> <tr> <td>FACU species <u>3.00</u></td> <td>x 4 = <u>12.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>135.00</u> (A)</td> <td><u>276.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.04</u>	Total % Cover of:	Multiply by:	OBL species <u>10.00</u>	x 1 = <u>10.00</u>	FACW species <u>112.00</u>	x 2 = <u>224.00</u>	FAC species <u>10.00</u>	x 3 = <u>30.00</u>	FACU species <u>3.00</u>	x 4 = <u>12.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>135.00</u> (A)	<u>276.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>10.00</u>	x 1 = <u>10.00</u>																	
FACW species <u>112.00</u>	x 2 = <u>224.00</u>																	
FAC species <u>10.00</u>	x 3 = <u>30.00</u>																	
FACU species <u>3.00</u>	x 4 = <u>12.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>135.00</u> (A)	<u>276.00</u> (B)																	
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>50.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Poa palustris</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☒ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Rubus pubescens</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>															
3. <u>Ribes triste</u>	<u>10</u>	<u>N</u>	<u>OBL</u>															
4. <u>Cornus canadensis</u>	<u>5</u>	<u>N</u>	<u>FAC</u>															
5. <u>Dryopteris carthusiana</u>	<u>2</u>	<u>N</u>	<u>FACW</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>77.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SR-C1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☒ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)

- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-C2U
Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): Convex Slope (%): 8-15
Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.907392 Long: -91.758513 Datum: WGS84
Soil Map Unit Name: Rollins cobbly sandy loam, 8 to 18 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Hardwood Forest upslope from Hardwood Swamp.	

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of two required)</u>
<u>Primary Indicators (minimum of one is required; check all that apply)</u>		____ Surface Soil Cracks (B6)
____ Surface Water (A1)	____ Water-Stained Leaves (B9)	____ Drainage Patterns (B10)
____ High Water Table (A2)	____ Aquatic Fauna (B13)	____ Moss Trim Lines (B16)
____ Saturation (A3)	____ Marl Deposits (B15)	____ Dry-Season Water Table (C2)
____ Water Marks (B1)	____ Hydrogen Sulfide Odor (C1)	____ Crayfish Burrows (C8)
____ Sediment Deposits (B2)	____ Oxidized Rhizospheres on Living Roots (C3)	____ Saturation Visible on Aerial Imagery (C9)
____ Drift Deposits (B3)	____ Presence of Reduced Iron (C4)	____ Stunted or Stressed Plants (D1)
____ Algal Mat or Crust (B4)	____ Recent Iron Reduction in Tilled Soils (C6)	____ Geomorphic Position (D2)
____ Iron Deposits (B5)	____ Thin Muck Surface (C7)	____ Shallow Aquitard (D3)
____ Inundation Visible on Aerial Imagery (B7)	____ Other (Explain in Remarks)	____ Microtopographic Relief (D4)
____ Sparsely Vegetated Concave Surface (B8)		____ FAC-Neutral Test (D5)
Field Observations:		Wetland Hydrology Present? Yes _____ No ☒
Surface Water Present? Yes _____ No ☒ Depth (inches): _____		
Water Table Present? Yes _____ No ☒ Depth (inches): _____		
Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No indicators of wetland hydrology were observed.		

VEGETATION – Use scientific names of plants.

 Sampling Point: SR-C2U

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Populus tremuloides</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40.00</u> (A/B)														
2. <u>Abies balsamea</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>5</u>	<u>N</u>	<u>FACU</u>															
4. <u>Acer rubrum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>60.0</u> = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0.00</u></td> <td>x 1 = <u>0.00</u></td> </tr> <tr> <td>FACW species <u>0.00</u></td> <td>x 2 = <u>0.00</u></td> </tr> <tr> <td>FAC species <u>60.00</u></td> <td>x 3 = <u>180.00</u></td> </tr> <tr> <td>FACU species <u>10.00</u></td> <td>x 4 = <u>40.00</u></td> </tr> <tr> <td>UPL species <u>70.00</u></td> <td>x 5 = <u>350.00</u></td> </tr> <tr> <td>Column Totals: <u>140.00</u> (A)</td> <td><u>570.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.07</u>	Total % Cover of:	Multiply by:	OBL species <u>0.00</u>	x 1 = <u>0.00</u>	FACW species <u>0.00</u>	x 2 = <u>0.00</u>	FAC species <u>60.00</u>	x 3 = <u>180.00</u>	FACU species <u>10.00</u>	x 4 = <u>40.00</u>	UPL species <u>70.00</u>	x 5 = <u>350.00</u>	Column Totals: <u>140.00</u> (A)	<u>570.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0.00</u>	x 1 = <u>0.00</u>																	
FACW species <u>0.00</u>	x 2 = <u>0.00</u>																	
FAC species <u>60.00</u>	x 3 = <u>180.00</u>																	
FACU species <u>10.00</u>	x 4 = <u>40.00</u>																	
UPL species <u>70.00</u>	x 5 = <u>350.00</u>																	
Column Totals: <u>140.00</u> (A)	<u>570.00</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Betula papyrifera</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>5.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)																		
1. <u>Carex richardsonii</u>	<u>40</u>	<u>Y</u>	<u>UPL</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☐ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Eurybia macrophylla</u>	<u>30</u>	<u>Y</u>	<u>UPL</u>															
3. <u>Clintonia borealis</u>	<u>5</u>	<u>N</u>	<u>FAC</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>75.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes _____ No <u>✓</u>														

SOIL

Sampling Point: SR-C24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,
☐ Histic Epipedon (A2)	MLRA 149B)
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (LRR K, L)
☐ Stratified Layers (A5)	☐ Loamy Gleyed Matrix (F2)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)
☐ Sandy Redox (S5)	
☐ Stripped Matrix (S6)	
☐ Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric Soil Present? Yes _____ No ☒

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Rapids Resort City/County: Lake County Sampling Date: 2023-10-20
 Applicant/Owner: Silver Rapids Resort LLC State: Minnesota Sampling Point: SR-C2W
 Investigator(s): GEI - Rob Peterson Section, Township, Range: sec 29 T063N R011W
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR K, MLRA 93A Lat: 47.907652 Long: -91.758479 Datum: WGS84
 Soil Map Unit Name: Greenwood-Greenwood ponded complex, 0 to 1 percent slopes, dense substratum NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes ☒ No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes ☒ No _____	
Wetland Hydrology Present? Yes ☒ No _____	
Remarks: (Explain alternative procedures here or in a separate report.) Hardwood Swamp.	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
☐ Surface Water (A1)	☒ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)
☒ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)
☒ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry-Season Water Table (C2)
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Crayfish Burrows (C8)
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)
		☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes ☒ No _____ Depth (inches): <u>2</u> Saturation Present? Yes ☒ No _____ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: **SR-C2W**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Fraxinus nigra</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)														
2. <u>Acer rubrum</u>	<u>33</u>	<u>Y</u>	<u>FAC</u>															
3. <u>Abies balsamea</u>	<u>10</u>	<u>N</u>	<u>FAC</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>83.0</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Cornus racemosa</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>15.00</u></td> <td>x 1 = <u>15.00</u></td> </tr> <tr> <td>FACW species <u>92.00</u></td> <td>x 2 = <u>184.00</u></td> </tr> <tr> <td>FAC species <u>48.00</u></td> <td>x 3 = <u>144.00</u></td> </tr> <tr> <td>FACU species <u>0.00</u></td> <td>x 4 = <u>0.00</u></td> </tr> <tr> <td>UPL species <u>0.00</u></td> <td>x 5 = <u>0.00</u></td> </tr> <tr> <td>Column Totals: <u>155.00</u> (A)</td> <td><u>343.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.21</u>	Total % Cover of:	Multiply by:	OBL species <u>15.00</u>	x 1 = <u>15.00</u>	FACW species <u>92.00</u>	x 2 = <u>184.00</u>	FAC species <u>48.00</u>	x 3 = <u>144.00</u>	FACU species <u>0.00</u>	x 4 = <u>0.00</u>	UPL species <u>0.00</u>	x 5 = <u>0.00</u>	Column Totals: <u>155.00</u> (A)	<u>343.00</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>15.00</u>	x 1 = <u>15.00</u>																	
FACW species <u>92.00</u>	x 2 = <u>184.00</u>																	
FAC species <u>48.00</u>	x 3 = <u>144.00</u>																	
FACU species <u>0.00</u>	x 4 = <u>0.00</u>																	
UPL species <u>0.00</u>	x 5 = <u>0.00</u>																	
Column Totals: <u>155.00</u> (A)	<u>343.00</u> (B)																	
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>5.0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Rubus pubescens</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☒ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Carex intumescens</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>															
3. <u>Carex disperma</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>															
4. <u>Dryopteris carthusiana</u>	<u>2</u>	<u>N</u>	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>67.0</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes ☒ No _____														

SOIL

Sampling Point: SR-C2W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| ☐ Histosol (A1) | ☐ Polyvalue Below Surface (S8) (LRR R, |
| ☐ Histic Epipedon (A2) | MLRA 149B) |
| ☐ Black Histic (A3) | ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| ☐ Hydrogen Sulfide (A4) | ☒ Loamy Mucky Mineral (F1) (LRR K, L) |
| ☐ Stratified Layers (A5) | ☐ Loamy Gleyed Matrix (F2) |
| ☒ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |
| ☐ Sandy Redox (S5) | |
| ☐ Stripped Matrix (S6) | |
| ☐ Dark Surface (S7) (LRR R, MLRA 149B) | |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: cobble

Depth (inches): 14

Hydric Soil Present? Yes ✓ No

Remarks:

Appendix D

USDA Soil Survey Information

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lake County, Minnesota
Survey Area Data: Version 19, Sep 10, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2014—Oct 2, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
F24A	Gnesen loam, 0 to 3 percent slopes	1.7	2.7%
F40D	Rollins cobbly sandy loam, 8 to 18 percent slopes	23.4	37.5%
J1a40A	Greenwood-Greenwood ponded complex, 0 to 1 percent slopes, dense substratum	4.3	6.9%
K1-10	Pits, gravel-Udipsamments complex	33.0	52.8%
W	Water	0.0	0.0%
Totals for Area of Interest		62.5	100.0%

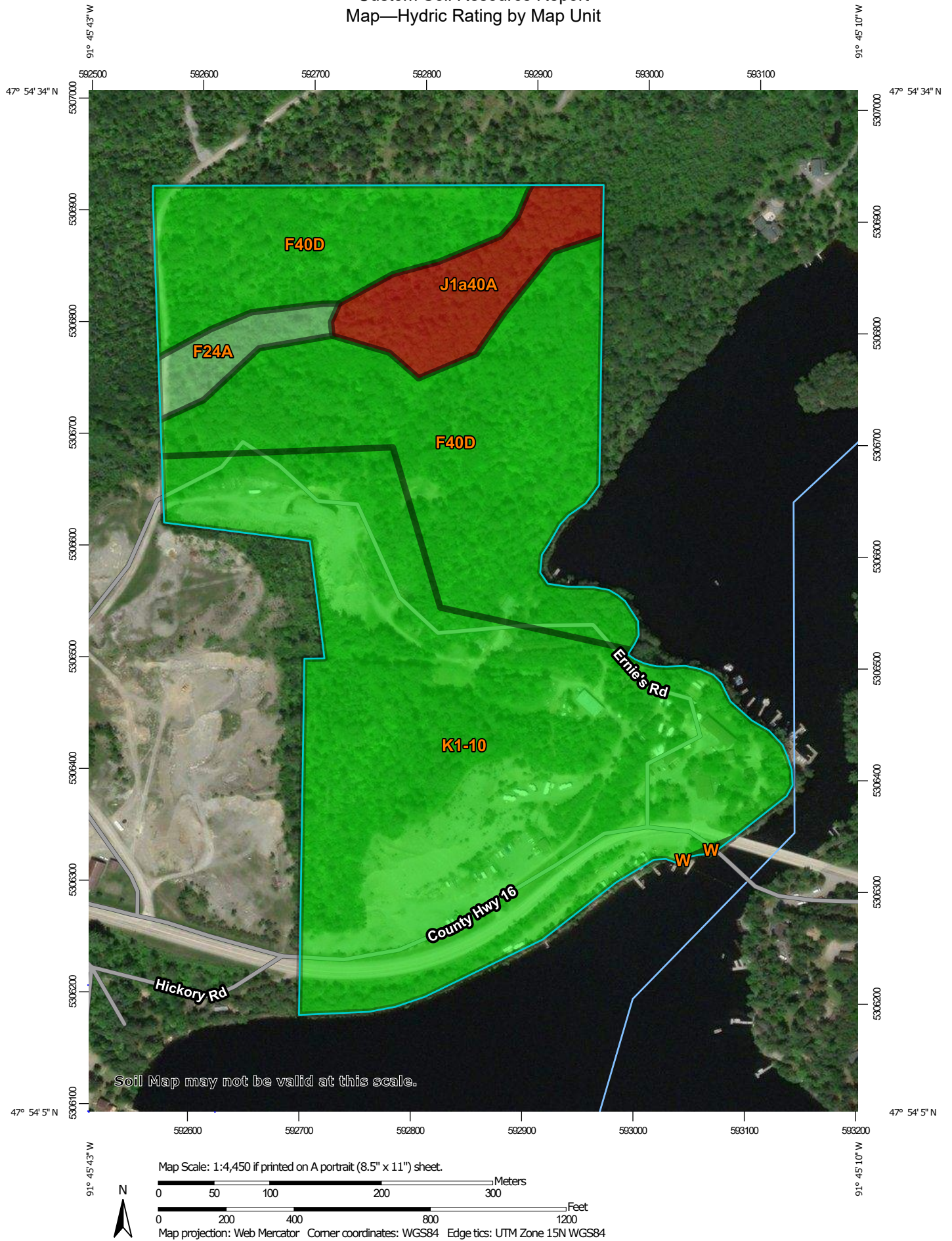
Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

Custom Soil Resource Report Map—Hydric Rating by Map Unit



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Soil Rating Lines

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Soil Rating Points

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

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Date(s) aerial images were photographed: Jun 7, 2014—Oct 2, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
F24A	Gnesen loam, 0 to 3 percent slopes	5	1.7	2.7%
F40D	Rollins cobbly sandy loam, 8 to 18 percent slopes	0	23.4	37.5%
J1a40A	Greenwood-Greenwood ponded complex, 0 to 1 percent slopes, dense substratum	100	4.3	6.9%
K1-10	Pits, gravel-Udipsamments complex	0	33.0	52.8%
W	Water	0	0.0	0.0%
Totals for Area of Interest			62.5	100.0%

Rating Options—Hydric Rating by Map Unit*Aggregation Method: Percent Present**Component Percent Cutoff: None Specified**Tie-break Rule: Lower*

Appendix F – Water Supply



Preliminary Groundwater Feasibility Assessment

Silver Rapids Lodge
May 5, 2026 (Revised)

Introduction

SD Consulting Group has completed a desktop review of background information regarding the potential for groundwater source development to service the expanded Silver Rapids Lodge. The purpose of this report is to present the results of this desktop evaluation and to make preliminary recommendations for the provision of a potable water supply to the redeveloped lodge. The following sources were consulted for this report:

- *Minnesota County Well Index (Online)*
- Geologic Atlas of Lake County, Plates 1-6 (Minnesota Geological Survey, 2022)

Background Information

Silver Rapids Lodge is located at 459 Kawishiwi Trail in Ely, Minnesota. The Lodge has been in operation since 1919 and currently consists of 12 cabins, several motel/lodge rooms, a bar/restaurant, and RV/tent camping sites. The Lodge is now considering an expansion as shown in **Figure 1**.



Figure 1: Proposed Layout

Redevelopment Plan

The redevelopment of the Lodge will occur over two phases, as detailed below:

- Phase One
 - New Main Lodge w/ restaurant, bar, pool, hot tub, sauna
 - 20 new 3BR/2BA Cabins
 - Remodeled motel, fish cleaning house, 7 cabins and sun house
- Phase Two
 - 24 new 3BR/2BA Cabins

Existing buildings not listed in the redevelopment plan above will be demolished during the redevelopment of the site.

Potable Water Demand

Water demand for the redeveloped lodge based on applicable Minnesota regulations are provided in **Table 1**. Peak demands are generally based on a total number of fixture units when designing water supply and distribution piping. However, for preliminary planning, a total flow per day based on occupancy was utilized for this report. During detailed design, fixture units will be considered in the sizing of distribution pumps and water storage volumes.

Table 1: Water Demands at Silver Rapids Lodge

Structure	# of Units	Persons/Unit	Demand/Person (GPD)	Peak Water Demand (GPD)
Cabin	51	4.5	50	11,475
Restaurant	100 seats		30	3,000
Employees	30		8	540
Hot Tub Fill ¹	1		350	350
Fish Shack	1		50	50
Motel	6	2	38	456
Peak Daily Demand				15,871 gpd
Average Daily Demand				7,936 gpd
Peak Demand				11.02 GPM

1. Assumes one hot tub is filled daily.

Based on the anticipated water demands, a groundwater well (or wells) capable of supplying 11.02 gallons per minute is required for the redevelopment. Considering it is not realistic to pump a groundwater well 24 hours/day, approximately 25 gpm of groundwater should be available to the development to meet water demands. If groundwater sources are not available to meet this demand, water storage may be necessary to meet the peak demands.

Site Geology and Hydrogeology

The proposed development is underlain by a shallow layer of glacial drift that varies in texture from boulders to gravel to sandy loam. Bedrock in this area of Lake County is typically encountered at shallow depths and is generally volcanic rocks of the midcontinent rift zone. Specifically at Silver Rapids Lodge, the bedrock mantling the surficial sediments is basalt from the Lake Vermillion Formation.

In this area, groundwater can be encountered in the shallow surficial sediments but is most common within the fracture zone of the volcanic bedrock. The shallow groundwater is typically low yielding and poor quality as the water is typically under the influence of surface waters. Bedrock aquifers produce higher quality water, but yields are variable depending on the number of fractures in the volcanic bedrock water availability. Generally, yields decrease as depth of the well increases.

According to the Minnesota DNR, the project is located in Groundwater Province 6, the “Arrowhead and Shallow Bedrock” Province. This area is characterized by low yielding aquifers in the crystalline bedrock. Bedrock is typically exposed at the surface or buried at shallow depths by shallow surficial soils. This is not an area commonly associated with high yielding groundwater supplies.

Existing Groundwater Well

Potable water is provided to the existing development through a groundwater well (ID#260280). This well is not registered on the MDH County Well index, so information on well construction, water quality and depth is unknown at this time.

Potential Groundwater Aquifers

Due to the thin layer of surficial sediments and the increased potential for contamination in a surficial groundwater well, the development of groundwater supplies within the surficial aquifer is unlikely at this site. Therefore, any future wells will be constructed into the crystalline bedrock aquifer. Based on the summary of nearby wells (next section), the groundwater wells will likely be 200-300 feet in depth. Generally, the well driller constructs the well with an open hole in an effort to capture groundwater from as many fractured zones as possible in the aquifer. New wells are cased through the surficial sediments and then is left as open hole throughout the bedrock portion.

Nearby Well Logs

Through the use of MDH's *County Well Index*, 29 domestic wells were identified within 0.5 miles of the Lodge. A summary of the domestic wells used in this evaluation is provided in **Table 2** and a list of all the wells is provided in **Attachment A**.

Table 2: Summary of Nearby Wells

Well ID	Yield (gpm)	Production Zone (range in feet)	Aquifer
741377	1	50-325	Bedrock (Ely Greenstone)
596823	0.8	50-306	Bedrock (Lake Vermillion)
656036	5	45-245	Bedrock
571269	NA	31-145	Bedrock
618975	NA	52-121	Bedrock (Ely Greenstone)
767386	NA	6-125	Bedrock
584577	6.6	18-194	Bedrock (Lake Vermillion)
722656	10	40-145	Bedrock (Lake Vermillion)
620150	3	18-306	Bedrock
706277	NA	20-185	Bedrock (Ely Greenstone)
769932	NA	25-325	Bedrock (Ely Greenstone)
756173	10	231-165	Bedrock (Ely Greenstone)
745356	NA	19-205	Bedrock (Ely Greenstone)
604457	NA	18-195	Bedrock (Ely Greenstone)
604456	NA	21-245	Bedrock (Ely Greenstone)
643169	NA	18-325	Bedrock (Ely Greenstone)
706274	NA	52-165	Bedrock (Ely Greenstone)
723370	NA	21-325	Bedrock (Ely Greenstone)
403892	10	20-105	Bedrock (Lake Vermillion)
852277	NA	50-165	Bedrock
859826	NA	20-305	Bedrock
808935	NA	42-85	Bedrock
769395	1.5	22-325	Bedrock
845850	NA	36-325	Bedrock
619977	NA	22-285	Bedrock
823883	NA	20-225	Bedrock
780065	1.6	32-235	Bedrock
146657	NA	25-220	Bedrock

Recommendations

Based on the information reviewed for this report, groundwater is available in the area of Silver Rapids Lodge. However, yields are generally low, and insufficient information is available on groundwater quality. The following recommendations are provided:

- Groundwater wells at Silver Rapids Lodge will need to meet a peak demand of 11.02 gpm at full buildout. To accomplish this with groundwater wells, a yield of 25 gpm should be supplied to prevent the well pumps from operating continuously.
- Based on a review of nearby wells and an understanding of the low yields likely in crystalline bedrock aquifers, it is likely that 10 gpm will be the maximum withdrawal from a groundwater well in the region.
- Therefore, a groundwater well capable of providing 25 gpm is unlikely and the following options are available to meet peak demands.
 - Drill multiple groundwater wells throughout the site. Approximately 3-4 wells will be required to meet this demand. Ideally, these wells are not interconnected whereas to cause well interference during pumping events.
 - Install water storage tanks capable of storing water for peak demand weekends. Based on the demands, a water storage tank of approximately 30,000 – 40,000 gallons is required. However, the volume of the water storage tank will vary based on the flow rate of the well and any newly constructed wells. In this scenario, the groundwater wells are continuously pumping throughout the week and filling the storage tank. During peak weekends when the wells cannot keep up, the water volume in the storage tank would be utilized.
 - Operations and maintenance of the storage tank would be required in this scenario to ensure that adequate chlorine residual is maintained in the water storage tank and throughout the distribution system.
- It is unlikely that groundwater wells can provide sufficient water to meet fire suppression requirements, which can require up to 2000 gpm of water over a 2-hour period. Alternative sources of fire suppression will be necessary.

Next Steps

Based on existing data and reports, groundwater source development is feasible for the lodge. However, additional testing is required to confirm water supply and quality, as noted below:

- A licensed well driller should inspect the existing well and confirm it meets current construction requirements. If not, a new well may be required.
 - During the inspection, a pump test should be completed on the well to determine a sustainable yield for the well.
 - Water quality testing should also be completed on the well to confirm water quality is sufficient for potable purposes.
- A second well should be drilled and tested on the property to provide a second groundwater source for the development. The existing and new well should be monitored during the pump testing to determine the interconnectivity of the wells and their groundwater aquifers.

- Based on the results of the well inspection and secondary well installation, a third well may be required on the site to meet the required water demands.

Thank you for the opportunity to work with Silver Rapids Lodge and their proposed redevelopment. If you have any questions regarding this report, please contact Shane Sparks at 612-209-7366 and I will be happy to assist you.

Sincerely,

SD Consulting Group, LLC

A handwritten signature in black ink, appearing to read "Shane Sparks", written in a cursive style.

Shane Sparks, P. Geo.

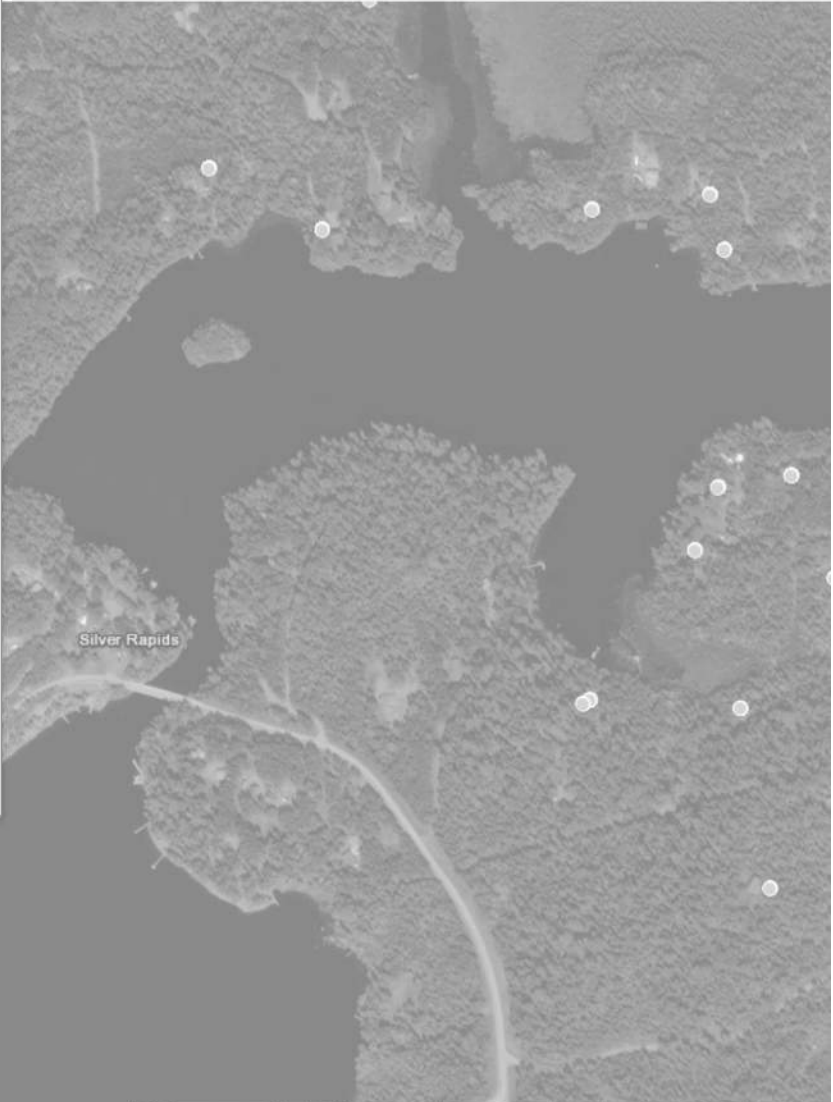
Principal Hydrogeologist

Attachment A

Nearby Well Information

Highlighted are Field Verified Wells. Click Unique Well ID to see detailed well information

Unique Number	Well Name	Address	City	County	Township	Range	Section	Depth(ft)	Elevation(ft)	Casing Depth(ft)	Casing Diameter
741377	KALINA, DOUG & DAWN	13463 IRONWOOD RD	null	Lake	63	11	32	325	1446	51	6
596823	MOSCHEL, RICHARD	2838 FALL LAKE	ELY	Lake	63	11	33	306	1398	51	6
656036	EILRICH, CHRIS & LAURIE	570 KELLY'S LOT RD	ELY	Lake	63	11	33	245	1395	33	6
571269	DICKENSON JR., L. CALL	L2845 FARM LAKE	ELY	Lake	63	11	28	145	1400	31	6
618975	THEOBALD, RAY	33 CR	ELY	Lake	63	11	32	121	1421	52	6
767386	ORLOSKE, TOM	RIVERVIEW RD	ELY	Lake	63	11	28	125	1396	21	6
584577	THOR, STEVE	345 WHITE E	ELY	Lake	63	11	33	194	1485	18	6
722656	KELLER, LYN	549 LOOP RD	ELY	Lake	63	11	33	145	1425	40	6
620150	HARVAT, BILL	562 KELLY'S LOTS RD	ELY	Lake	63	11	28	306	1407	18	6
706277	WAISER, NANCY	IRONWOOD DR	ELY	Lake	63	11	32	185	1468	21	6
769932	HART, ERIC	13435 HICKORY RD	ELY	Lake	63	11	32	325	1440	25	6
756173	SETTERHOLM, DAVID	RIVERVIEW RD	ELY	Lake	63	11	28	165	1412	23	6
745356	SELISKAR, CRAIG	415 ERNIE'S RD	ELY	Lake	63	11	29	205	1427	19	6
604547	PINCKNEY, JAMES	12336 TOWN 35 RD	ELY	Lake	63	11	29	195	1391	18	6
604546	PINCKNEY, ROBERT & MARY	2334 TOWN 35 RD	ELY	Lake	63	11	29	245	1405	21	6
634169	SEEGER, RON	KELLY LAKE RD	ELY	Lake	63	11	33	325	1413	28	6
706274	SCHWARZE, KURT	GARDEN LAKE RD	ELY	Lake	63	11	28	165	1394	52	6
723370	WHITTEN, BOB	398 WHITE IRON VILLA RD	ELY	Lake	63	11	32	325	1464	21	6
403892	TOMALINSON, WALTER	null	null	Lake	63	11	33	125	1430	22.5	6
852277	FISHER, JOSEPH	540 RIVERVIEW RD	ELY	Lake	63	11	28	165	null	52	6
859826	PRUSE JR., BERNARD	13420 IRONWOOD	ELY	Lake	63	11	32	325	null	21	6
808935	ZIMMERMAN, MARY	13446 HICKORY RD	ELY	Lake	63	11	32	85	null	42	6
769395	ITEN, JOHN	482 KAWASHIWI TR	ELY	Lake	63	11	32	325	null	22	6
845850	PEAKE, ERNEST	13491 PINEHURST DR	ELY	Lake	63	11	32	325	null	36	6
618977	MARDSEN, CHARLES	PINE RD	ELY	Lake	63	11	33	285	null	22	6
823883	HALL, JUDITH & FRYER, LINDA	13487 BAY RD	ELY	Lake	63	11	33	225	null	20	5
780865	JORGENSEN, TODD + ELISE	592 VOYAGEUR RD	ELY	Lake	63	11	33	325	null	32	6
146657	JANSEN, JOHN	null	null	Lake	63	11	33	220	null	25	6



0 300 600ft
UTM: 593989 (x), 5305899 (y) Latitude/Longitude: 47.89953 / -91.74245
Township: 63 North, Range: 11 West, Section: 32, City/Township: Fall Lake Twp.

260280

County Lake
Quad Ely
Quad ID 347A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 10/24/2005
Update Date 03/10/2014
Received Date

Well Name Township Range Dir Section Subsection SILVER RAPIDS 63 11 W 32 ABAABA					Well Depth 0 ft.		Depth Completed 0 ft.		Date Well Completed									
Elevation 1427 Elev. Method Calc from DEM (USGS 7.5 min or equiv.)					Drill Method				Drill Fluid									
Address					Use public supply/non-comm.-transient				Status Active									
					Well Hydrofractured? Yes ☐ No ☐ From				To									
					Casing Type				Joint									
Stratigraphy Information					Drive Shoe? Yes ☐ No ☐		Above/Below											
												Open Hole From ft. To ft.						
					Screen? ☐ Type							Make						
					Static Water Level													
					Pumping Level (below land surface)													
Wellhead Completion																		
Pitless adapter manufacturer					Model													
☐ Casing Protection					☐ 12 in. above grade													
☐ At-grade (Environmental Wells and Borings ONLY)																		
Grouting Information					Well Grouted? ☐ Yes ☐ No ☒ Not Specified													
					Nearest Known Source of Contamination													
					<u>0</u> feet Direction							Type						
					Well disinfected upon completion? ☐ Yes ☐ No													
					Pump ☐ Not Installed		Date Installed											
					Manufacturer's name													
					Model Number		HP		Volt									
					Length of drop pipe		ft		Capacity		g.p.		Typ					
					Abandoned													
					Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No													
					Variance													
Was a variance granted from the MDH for this well? ☐ Yes ☐ No																		
Miscellaneous																		
First Bedrock					Aquifer													
Last Strat					Depth to Bedrock ft													
Located by					Minnesota Department of Health													
Locate Method					GPS SA Off (averaged) (15 meters)													
System					UTM - NAD83, Zone 15, Meters		X 592898		Y 5306547									
Unique Number Verification					Info/GPS from data		Input Date		10/21/2005									
					Angled Drill Hole													
					Well Contractor													
					Licensee Business Lic. or Reg. No. Name of Driller													

Minnesota Well Index Report

260280

Printed on 03/09/2026
HE-01205-15

Appendix G – Subsurface Sewage Treatment Systems

MEMORANDUM



To: Jamie Tatge, Leisure Hotel & Resorts

From: Robert W. Whitmyer, CPSS, PSS, Advanced Designer/Inspector

Date: June 2, 2026

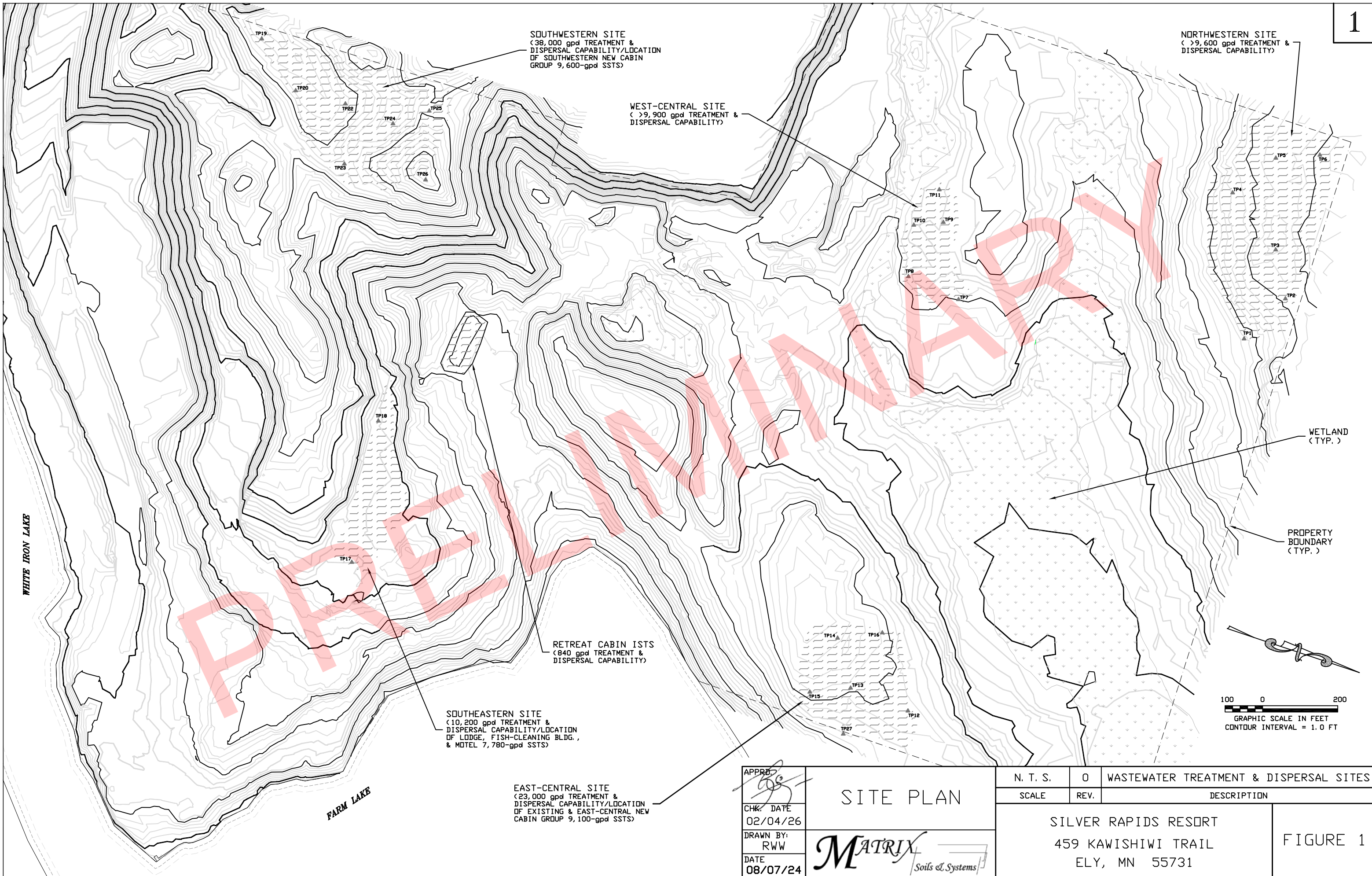
Re: Silver Rapids Resort Onsite Wastewater Treatment and Dispersal

Redevelopment of Silver Rapids Lodge on the shores of White Iron and Farm lakes, including continuation and expansion of current uses, will be served by three mid-sized sewage treatment systems (MSTS > 5,000-to-10,000 gallons per day, gpd) and an existing individual sewage treatment system (ISTS ≤ 2,500 gpd) having the following design flows:

- 24-Southwestern Cabin Group – 9,600 gpd
- Lodge Group (lodge, beach sanitation building, fish-cleaning building, motel, and 5 existing cabins) – 9,210 gpd
- 20-East-Central Cabin Group – 8,000 gpd
- Retreat Cabin – 600 gpd (flow/ownership to be included with the Lodge Group)

To accommodate the redevelopment, four identified septic tank effluent (STE) treatment and dispersal sites: Southwestern, East-Central, West-Central, and Northwestern have been evaluated. Southwestern, Southeastern, and East-Central sites comprise of deep (> 84 inches), very coarse, USDA Natural Resources Conservation Service (NRCS)-mapped Rollins-like loamy sands; those of the West-Central and Northwestern sites shallower (36-and-42 inches, respectively, above bedrock), coarse-but-finer than Biwabik-like loamy sands, an indicated minor component of the Rollins mapping unit. Projected treatment and dispersal capabilities of the Southwestern (38,000 gpd) and East-Central (23,000 gpd) sites exceed twice the need of the recommended facility groupings to be associated: 24-new-cabin grouping along ridge overlooking White Iron Lake (9,600 gpd) and 20-new-cabin grouping in eastern portion of the property adjacent to Farm Lake (8,000 gpd), respectively. Southeastern Site treatment and dispersal capability (10,200 gpd) exceeds that needed (9,210 gpd) for the expanded Lodge Group with East-Central and Northeastern site treatment and dispersal capabilities, greater than or equal to 9,900-and-9,600 gpd, respectively, being more than sufficient for system replacement.

Due to coarseness of native soils and high strength of a few facilities of the Lodge Group (lodge bar/restaurant, sanitation building, and fish-cleaning building), additional pretreatment of STE will be a necessary component of all subsurface sewage treatment systems (SSTS's). All dispersal systems will utilize (mound) sand-lined, in-ground, Eljen GSF beds to both additionally pretreat STE to a Minnesota Pollution Control Agency (MPCA) treatment Level B and minimize land-area impacted. The current lodge SSTS is pretreated to an MPCA treatment Level C using Nibbler aerobic treatment units (ATU's); this method of advanced pretreatment will be continued and expanded. Nitrogen reduction, if necessary, will be achieved via an advanced pretreatment unit such as Advantex textile filters. Surge-storage and timed-dosing will be used to both minimize advanced pretreatment unit size and foster effective pretreatment unit processes. Septic tank pretreatment of the new-cabin groups sewage will be within individual tanks, Lodge Group septic tank pretreatment utilizing many of the existing tanks newly-installed in 2024 in proximity of group facilities.



Appendix H – Site Contamination

Data

What's in My Neighborhood

[Help](#) [FAQ](#) [WIMN Glossary](#) [Feedback](#) [New search](#)

Silver Rapids Lodge

Location:	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Watershed:	Rainy River - Headwaters (09030001)
Latitude:	47.90412193
Longitude:	-91.75477038
Coordinate collection method:	Digitized - MPCA internal map
Currently active?	Yes
Institutional controls:	No



Province of Ontario, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA,... Powered by Esri

[Search with a map](#)



Investigation and Cleanup

Brownfields - BF0002139 - Petroleum Brownfield and Voluntary Investigation and Cleanup

Status: Active

Brownfields are potentially contaminated sites where the MPCA is helping buyers, sellers, developers, or local governments to voluntarily investigate and clean up land for sale, financing or redevelopment. Sites may be petroleum brownfields, non-petroleum brownfields, or both. Non-petroleum brownfields are called Voluntary Investigation and Cleanup sites.

[Less Detail ▲](#)

Events

Event	Start	End
PBP - Phase I Report Reviewed	08/09/2024	08/26/2024
PBP - Response Action Plan (RAP) Reviewed	08/09/2024	08/26/2024
PBP - Phase II Report Reviewed	08/09/2024	08/09/2024
VIC - Response Action Plan (RAP) Approval Letter Issued	06/19/2024	08/16/2024
VIC - Response Action Plan (RAP) Reviewed	06/19/2024	08/06/2024
PBP - Technical Review of Phase I Report Completed	06/19/2024	07/18/2024
PBP - Technical Review of Phase II Report Completed	06/19/2024	07/18/2024
PBP - Technical Review of Response Action Plan (RAP) Completed	06/19/2024	07/18/2024
No Association Determination Letter Issued	03/15/2022	08/11/2022
Lender Letter Issued	03/03/2022	08/02/2022
VIC - Phase I Report Reviewed	03/03/2022	06/06/2022
VIC - Phase II Report Reviewed	03/03/2022	06/06/2022
General Liability Letter Issued	03/03/2022	04/14/2022
PBP - Phase I Report Reviewed	03/03/2022	04/12/2022
PBP - Phase II Report Reviewed	03/03/2022	04/12/2022
Application Completeness Determined	03/03/2022	03/03/2022

Links to additional data sources

There are no links for this activity. Contact the file manager or program contact to determine if additional information is available.

Brownfields - BF0002046 - Petroleum Brownfield and Voluntary Investigation and Cleanup

Status: Inactive

Brownfields are potentially contaminated sites where the MPCA is helping buyers, sellers, developers, or local governments to voluntarily investigate and clean up land for sale, financing or redevelopment. Sites may be petroleum brownfields, non-petroleum brownfields, or both. Non-petroleum brownfields are called Voluntary Investigation and Cleanup sites.

[Less Detail ▲](#)

Events

Event	Start	End
Site Closed	01/20/2022	01/20/2022
No Association Determination Letter Issued	12/13/2021	01/20/2022
VIC - Phase I Report Reviewed	12/13/2021	01/20/2022
VIC - Phase II Report Reviewed	12/13/2021	01/20/2022
General Liability Letter Issued	12/13/2021	01/06/2022
PBP - Phase I Report Reviewed	12/13/2021	01/03/2022
PBP - Phase II Report Reviewed	12/13/2021	01/03/2022
Application Completeness Determined	12/13/2021	12/13/2021

Links to additional data sources

There are no links for this activity. Contact the file manager or program contact to determine if additional information is available.

Status: Inactive

Leak sites are locations where a release of petroleum products has occurred from a tank system. Leak sites can occur from aboveground or underground tank systems as well as from spills at tank facilities.

[Less Detail ▲](#)

Events

Event	Start	End
Site Closed	10/17/2018	10/17/2018
Requested Information/Report Reviewed	07/20/2018	10/17/2018
Technical Review of Requested Information/Report Completed	07/20/2018	10/17/2018
More Work Requested	05/21/2018	05/21/2018
Commissioner's Site Report Request Processed	05/08/2018	05/15/2018
Commissioner's Site Report Review Request Completed	05/08/2018	05/08/2018
Limited Site Investigation Reviewed	02/20/2018	05/21/2018
Technical Review of Limited Site Investigation Report Completed	02/20/2018	05/17/2018
Standard Letter Issued	05/03/2017	05/04/2017
Responsible Party Determined	04/26/2017	04/26/2017
Leak Reported	04/24/2017	04/24/2017
Leak Discovered	04/22/2017	04/22/2017

Inspections and field work

Type	Date
Field Work Notification	10/24/2017

Links to additional data sources

[Leak Data - LS0020370](#)

Petroleum Remediation - LS0022243 - Leak Site

Status: Active

Leak sites are locations where a release of petroleum products has occurred from a tank system. Leak sites can occur from aboveground or underground tank systems as well as from spills at tank facilities.

[Less Detail ▲](#)

Events

Event	Start	End
Wakeup Request Issued	11/14/2025	11/14/2025
Wakeup Request Issued	09/18/2025	09/18/2025
Wakeup Request Issued	07/31/2025	07/31/2025
Standard Letter Issued	08/01/2024	08/01/2024
Responsible Party Determined	07/31/2024	07/31/2024
Leak Reported	07/10/2024	07/10/2024
Leak Discovered	10/01/2021	10/01/2021

Inspections and field work

Type	Date
Field Work Notification	05/18/2026
Field Work Notification	02/04/2026

Links to additional data sources

[Leak Data - LS0022243](#)



Tanks

Underground Tanks - TS0016183

Status: Active

An aboveground storage tank site has at least one tank of a certain size on the premises. A tank site may have multiple tanks and these tanks may contain food products, petroleum products, or other substances.

[Less Detail ▲](#)

Events

Event	Start	End
Notice Received	07/18/2022	07/18/2022
Notice Received	04/23/2018	04/23/2018
Notice Received	04/11/2017	04/11/2017
Notice Received	04/05/2017	04/05/2017
UST Ten-Day Adv Notice	05/04/2000	
Registration Received	03/21/1992	03/21/1992
Registration Received	07/01/1983	07/01/1983

Inspections and field work

Type	Date
UT Inspection	04/30/2025
UT Inspection	05/04/2022
UT Inspection	05/28/2019
UT Inspection	08/31/2016
UT Inspection	04/01/2008
UT Inspection	10/24/1997

Enforcement activities

Case type	Net penalty	Discovery date	Action date	Closure date
Citation Warning	None	05/04/2022	05/17/2022	11/07/2023
Citation Warning	None	08/31/2016	09/02/2016	06/26/2018

Links to additional data sources

Contact us

651-296-6300 or 800-657-3864

- Email us
- Regional offices

**Environmental
emergencies (24 hrs)**
800-422-0798

Follow us



Sign up for **Gov Delivery**
emails on many MPCA
topics

Tools

- Assistance (How can we help?)
- Ask us a question
- Glossary of terms

MPCA website policies
and disclaimers

 Register to vote

Silver Rapids Lodge

Site ID	TS0016183
Location	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Tank Count	5 tanks are (or were) located at this site.



lat/long: 47.90412193,-91.75477038

Tank number	Install date	Registration date	Tank capacity	Tank status	Stored product	Above or underground
001	05/01/1980	03/21/1992	500	Removed	Gasoline	Underground
002	05/01/1980	03/21/1992	500	Removed	Gasoline	Underground
003	07/01/1983	07/01/1983	1500	Removed	Fuel Oil	Underground
004	05/01/1980	03/21/1992	1000	Active	Diesel	Underground
005	07/01/1983	07/01/1983	500	Active	Non-oxygenated gasoline	Underground

For further information on aboveground or underground storage tank systems, please visit MPCA's storage tank [program page](#) or [publications page](#).

Tank and leak site dashboard

Silver Rapids Lodge

Site ID	TS0016183
Tank number	001
Location	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Tank numbers	001, 002, 003, 004, 005



lat/long: 47.90412193,-91.75477038

General tank information

Tank number	001
Tank registration date	03/21/1992
Aboveground or underground	Underground
Tank storage capacity	500
Tank status	Removed 04/22/1999
Tank stored product	Gasoline

Tank construction

Tank material type	Bare/Paint/Asph Coat Steel
Tank wall type	Single-Walled
Tank corrosion protection	Not needed
Pipe material type	Copper

Pipe wall type	Single-Walled
Pipe corrosion protection	None
Tank dispenser type	Suction
Spill containment wall type	

Overfill protection

UST Not needed

Tank release detection

UST Not needed

Piping release detection

Safe Suction

Tank and leak site dashboard

Silver Rapids Lodge

Site ID	TS0016183
Tank number	002
Location	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Tank numbers	001, 002, 003, 004, 005



lat/long: 47.90412193,-91.75477038

General tank information

Tank number	002
Tank registration date	03/21/1992
Aboveground or underground	Underground
Tank storage capacity	500
Tank status	Removed 04/22/1999
Tank stored product	Gasoline

Tank construction

Tank material type	Bare/Paint/Asph Coat Steel
Tank wall type	Single-Walled
Tank corrosion protection	Not needed
Pipe material type	Copper

Pipe wall type	Single-Walled
Pipe corrosion protection	None
Tank dispenser type	Suction
Spill containment wall type	

Overfill protection

UST Not needed

Tank release detection

UST Not needed

Piping release detection

Safe Suction

Tank and leak site dashboard

Silver Rapids Lodge

Site ID	TS0016183
Tank number	003
Location	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Tank numbers	001, 002, 003, 004, 005



lat/long: 47.90412193,-91.75477038

General tank information

Tank number	003
Tank registration date	07/01/1983
Aboveground or underground	Underground
Tank storage capacity	1500
Tank status	Removed 04/10/2017
Tank stored product	Fuel Oil

Tank construction

Tank material type	Bare/Paint/Asph Coat Steel
Tank wall type	Single-Walled
Tank corrosion protection	Not needed
Pipe material type	Copper

Pipe wall type	Single-Walled
Pipe corrosion protection	None
Tank dispenser type	Suction
Spill containment wall type	

Overfill protection

UST Not needed

Tank release detection

UST Not needed

Piping release detection

Safe Suction

Tank and leak site dashboard

Silver Rapids Lodge

Site ID	TS0016183
Tank number	004
Location	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Tank numbers	001, 002, 003, 004, 005



lat/long: 47.90412193,-91.75477038

General tank information

Tank number	004
Tank registration date	03/21/1992
Aboveground or underground	Underground
Tank storage capacity	1000
Tank status	Active
Tank stored product	Diesel

Tank construction

Tank material type	Bare/Paint/Asph Coat Steel
Tank wall type	Single-Walled
Tank corrosion protection	Sacrificial anode
Pipe material type	Steel, SW

Pipe wall type	Single-Walled
Pipe corrosion protection	Sacrificial anode
Tank dispenser type	Suction
Spill containment wall type	Single-Walled

Overfill protection

UST Not needed

Tank release detection

UST Statistical inventory reconciliation

Piping release detection

Safe Suction

Tank and leak site dashboard

Silver Rapids Lodge

Site ID	TS0016183
Tank number	005
Location	459 Kawishwi Trl Ely, MN 55731-8194 Lake County
Tank numbers	001, 002, 003, 004, 005



lat/long: 47.90412193,-91.75477038

General tank information

Tank number	005
Tank registration date	07/01/1983
Aboveground or underground	Underground
Tank storage capacity	500
Tank status	Active
Tank stored product	Non-oxygenated gasoline

Tank construction

Tank material type	STI-P3
Tank wall type	Single-Walled
Tank corrosion protection	Sacrificial anode
Pipe material type	Steel

Pipe wall type	Single-Walled
Pipe corrosion protection	Sacrificial anode
Tank dispenser type	Suction
Spill containment wall type	Single-Walled

Overfill protection

UST Not needed

Tank release detection

UST Statistical inventory reconciliation

Piping release detection

Safe Suction

Silver Rapids Lodge

Site ID	LS0020370
Site type	Leak Site
Location	459 Kawishiwi Trl Ely, MN 55731 Lake County
Release discovered	04/22/2017
Release reported	04/24/2017
Site closure date	10/17/2018
Product released	Fuel Oil #1 & #2
Regulatory designation	State



lat/long: 47.90417939,-91.75482337

Cleanup actions

There are no cleanup actions to display for this site.

Site contacts

Type	Name	Address	Start date	End date
has Responsible Party of	Gary Tedrick	459 Kawishiwi Trl Ely, Minnesota 557318194	04/24/2017	

Treatments

There are no treatments to display for this site.

Reporting

Task	Start	End
Leak Discovered	04/22/2017	04/22/2017
Leak Reported	04/24/2017	04/24/2017
Responsible Party Determined	04/26/2017	04/26/2017
Standard Letter Issued	05/03/2017	05/04/2017
Commissioner's Site Report Review Request Completed	05/08/2018	05/08/2018
Commissioner's Site Report Request Processed	05/08/2018	05/15/2018
Technical Review of Limited Site Investigation Report Completed	02/20/2018	05/17/2018
Limited Site Investigation Reviewed	02/20/2018	05/21/2018
More Work Requested	05/21/2018	05/21/2018
Technical Review of Requested Information/Report Completed	07/20/2018	10/17/2018
Site Closed	10/17/2018	10/17/2018
Requested Information/Report Reviewed	07/20/2018	10/17/2018

Field work

Notice received	Work date	Start time	Consultant	Contractor	Work type
10/20/2017	10/24/2017	08:00 AM	Northeast Technical Services	Range Environmental Drilling	Exterior Temporary Soil Gas Sampling Soil Borings Water Well Sampling

Release details

Tank type	UST
Tank material	Unknown

Piping material	Unknown
Source of the release	Tank
Cause of the release	Unknown
Release detection method	Removal
Has the site ever had an E-85 tank?	No

Silver Rapids Lodge

Site ID	LS0022243
Site type	Leak Site
Location	459 Kawishiwi Trl Ely, MN 55731 Lake County
Release discovered	10/01/2021
Release reported	07/10/2024
Site closure date	Active
Product released	Gasoline
Regulatory designation	State
Project manager	Kania, Lauralin



lat/long: 47.90413319,-91.75478727

Cleanup actions

There are no cleanup actions to display for this site.

Site contacts

Type	Name	Address	Start date	End date
has Responsible Party of	Silver Rapids Resort LLC	800B W Railroad St Duluth, Minnesota 558022645	07/10/2024	
has Responsible Party of	Jamie Tatge	800B W Railroad St Duluth, Minnesota 558022645	07/10/2024	
has EDS Responsible Official of	Jamie Tatge	800B W Railroad St Duluth, Minnesota 558022645	07/10/2024	

Type	Name	Address	Start date	End date
has EDS Responsible Official of	Silver Rapids Resort LLC	800B W Railroad St Duluth, Minnesota 558022645	07/10/2024	

Treatments

There are no treatments to display for this site.

Reporting

Task	Start	End
Leak Discovered	10/01/2021	10/01/2021
Leak Reported	07/10/2024	07/10/2024
Responsible Party Determined	07/31/2024	07/31/2024
Standard Letter Issued	08/01/2024	08/01/2024
Wakeup Request Issued	07/31/2025	07/31/2025
Wakeup Request Issued	09/18/2025	09/18/2025
Wakeup Request Issued	11/14/2025	11/14/2025

Field work

Notice received	Work date	Start time	Consultant	Contractor	Work type
01/28/2026	02/04/2026	09:00 AM	Northeast technical Services Inc.		Receptor Survey Soil Borings Vapor Survey
05/14/2026	05/18/2026	09:00 AM	Northeast Technical Services		Soil Borings

Release details

Tank type	UST
-----------	-----

Tank material	Steel
Piping material	Unknown
Source of the release	Tank
Cause of the release	Unknown
Release detection method	Investigation
Has the site ever had an E-85 tank?	No

May 22, 2018

Gary Tedrick
459 Kawishiwi Trl
Ely MN 55731

RE: Request for Additional Work
Site: Silver Rapids Lodge, 459 Kawishiwi Trl, Ely Lake 55731
MPCA Site ID: LS0020370

Dear Gary Tedrick:

The Minnesota Pollution Control Agency (MPCA) has reviewed the report titled, Limited Site Investigation, dated December 6, 2017, prepared by Northeast Technical Services, your environmental consultant. Based upon information provided in the report, it has been determined that additional work is required at the above-referenced site. Specifically, the following activities should be conducted:

The well log for the onsite well (260280) was non-descript and the well is not listed on the CWI. The consultant needs to inquire about and submit well details (size, depth, screen interval, water level).

The report also indicates a current/active 1,000-gal fuel oil tank is located at the site. This UST not depicted on a site figure. Please add this to the site map.

The MPCA requests that the work be completed and a report be submitted within 60 days of the date of this letter. Failure to meet this deadline in a timely manner may result in reductions in Petrofund reimbursement or lead to MPCA enforcement actions.

Thank you for your response to this petroleum tank release and for your cooperation with the MPCA to protect public health and the environment. If you have any questions regarding this letter, please Roberta Wirth-Feeney, Project Manager, at 651-757-2830 or by email at roberta.wirth-feeney@state.mn.us or Sara Nelson, at 651-757-2300 or by email at sara.nelson@state.mn.us.

Sincerely,

Roberta Wirth-Feeney

This document has been electronically signed.

Roberta Wirth- Feeney
Project Manager
Petroleum Remediation & Redevelopment Section
Remediation Division

Sara Nelson

This document has been electronically signed.

Sara Nelson
Hydrologist
Petroleum Remediation & Redevelopment Section
Remediation Division

WRF/SN:ah

cc: Allison Smrekar, Northeast Technical Services Inc

October 23, 2018

Gary Tedrick
459 Kawishiwi Trail
Ely MN 55731

RE: Petroleum Tank Release Site File Closure
Site: Silver Rapids Lodge, 459 Kawishiwi Trl, Ely Lake 55731
MPCA Site ID: LS0020370

Dear Gary Tedrick:

The Minnesota Pollution Control Agency (MPCA) is pleased to let you know it has determined your investigation and/or cleanup have adequately addressed the petroleum tank release at the site (Site) listed above. Based on the information provided, the MPCA has closed the petroleum tank release site file.

The closure of the petroleum tank release site file means the MPCA does not require any additional investigation and/or cleanup work at this time or in the foreseeable future. Please be aware that file closure does not necessarily mean that all petroleum contamination has been removed from this Site. However, the MPCA has concluded that any remaining contamination, if present, does not appear to pose a threat to public health or the environment under current conditions.

The MPCA reserves the right to reopen this file and to require additional investigation and/or cleanup work if new information, changing regulatory requirements, or changed land use makes additional work necessary. If you or other parties discover additional contamination (either petroleum or non-petroleum) that was not previously reported, Minnesota state law requires that the MPCA be notified immediately.

You should understand this letter does not release any party from liability for the petroleum contamination under Minn. Stat. § 115C.021, subd. 1 or any other applicable state or federal law. In addition, this letter does not release any party from liability for non-petroleum contamination, if present, under Minn. Stat. § 115B, the Minnesota Environmental Response and Liability Act.

The monitoring wells for this Site should be sealed in accordance with the Minnesota Department of Health (MDH) Well Code, Chapter 4725. If you choose to keep any monitoring well, the MDH will continue to assess a maintenance fee.

Please note that as a result of performing the requested work you may be eligible to apply to the Petroleum Tank Release Compensation Fund (Petrofund) for partial reimbursement of the costs you have incurred in investigating and cleaning up this petroleum tank release. The Petrofund is administered by the Petroleum Tank Release Compensation Board (Petro Board) and the Minnesota Department of Commerce. To learn more about who is eligible, the types of work, and the amount of reimbursement available, please contact the Petrofund at 651-539-1515 or 800-638-0418.

Gary Tedrick
Page 2
October 23, 2018

If future development of this property or the surrounding area is planned, it should be assumed that petroleum contamination may still be present. If petroleum contamination is encountered during future development work, the MPCA should be notified immediately.

Thank you for your response to this petroleum tank release and for your cooperation with the MPCA to protect public health and the environment. If you have any questions regarding this letter, please contact Roberta Wirth-Feeney, Project Manager, at 651-757-2830 or by email at roberta.wirth-feeney@state.mn.us or Sara Nelson, at 651-757-2300 or by email at sara.nelson@state.mn.us.

Sincerely,

Roberta Wirth-Feeney

This document has been electronically signed.

Roberta Wirth-Feeney
Project Manager
Petroleum Remediation & Redevelopment Section
Remediation Division

Sara Nelson

This document has been electronically signed.

Sara Nelson
Hydrologist
Petroleum Remediation & Redevelopment Section
Remediation Division

RWF/SN:ah

cc: Harold Langowski, City of Ely
Tom Erchull, City of Ely
Mark St. Lawrence, St. Louis County
Allison Smrekar, NTS, Inc.
Kara Dennis, MDH (electronic)

January 6, 2022

VIA EMAIL

George Pond
1 Rangeview Drive
Wheat Ridge, CO 80215-6617

RE: Petroleum Tank Release Liability
Silver Rapids Lodge, 459 Kawishwi Trail, Ely
MPCA Site ID: LS0020370 (BF0002046)
MPCA Billing ID: 216487
PIN: 28-6311-29850, 28-6311-32070

Dear George Pond:

Under Minn. Stat. § 115C.021, subd. 1, a person is responsible for a release from a tank if that person owned or operated the tank any time during or after the release. If a person comes into possession of property where there has been a release after the tanks have been removed that person is not a responsible person under the statutory definition and the Minnesota Pollution Control Agency (MPCA) cannot order that person to take corrective action under Minn. Stat. § 115C.

Liability is further limited for lenders. Minn. Stat. § 115C.021, subd. 4, provides that a mortgagee is not responsible for a release from a tank solely because the mortgagee becomes an owner of real property where the tank is located through foreclosure or receipt of a deed in lieu of foreclosure.

This letter represents the views of the MPCA and is based upon information disclosed to the MPCA as of the date hereof. Depending on your circumstances, it may or may not be construed as releasing any person from liability under state or federal laws. If you have questions concerning your particular situation, the MPCA recommends that you discuss your concerns with your legal counsel.

If future development of the Site or the surrounding area is planned, it should be assumed that petroleum contamination is present. Property with petroleum contamination to soil or groundwater may cause risks to future occupants. Brownfield staff can assist with environmental risk and development plan review, and will review, approve, and/or modify your plan for property development. If contamination is encountered during future development work, the MPCA should be notified immediately.

George Pond
Page 2
January 6, 2022

This letter is subject to the disclaimers found in Attachment A. If you have any questions about the contents of this letter, please contact Brittney Schuller, Project Manager, at 651-757-2444 or brittney.schuller@state.mn.us.

Sincerely,

Brittney Schuller

This document has been electronically signed.

Brittney Schuller
Project Manager
Remediation Division

BS:mh

Enclosure

cc: Jenny Holmes, NTS (electronic)

Disclaimers

Silver Rapids Lodge

MPCA Site ID: BF0002046

PIN: 28-6311-29850, 28-6311-32070

1. Reservation of authorities

The Minnesota Pollution Control Agency (MPCA) Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such actions if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release, or create an imminent and substantial danger to public health and welfare.

2. No MPCA assumption of liability

The MPCA, its Commissioner, and staff do not assume any liability for any release, threatened release or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter based on current information

All statements, conclusions, and representations in this letter are based upon information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion or representation and to take any appropriate action under his authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer regarding use or development of the property

The MPCA, its Commissioner, and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer regarding investigative or response action at the property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

6. This approval does not supplant any applicable state or local stormwater permits, ordinances, or other regulatory documents.

April 15, 2022

VIA EMAIL

Alex Bushey
Iron Rock Development, LLC
800B Railroad Street
Duluth, MN 55802-2645

Brian Bosley
National Bank of Commerce
306 Superior Street
Duluth, MN 55802-1803

RE: Petroleum Tank Release Liability
Silver Rapids Lodge 459 Kawishwi Trl, Ely
MPCA Site ID: LS0020370 (BF0002139)
MPCA Billing ID: 216487
PIN: 28-6311-29850, 28-6311-32070

Dear Alex Bushey and Brian Bosley:

Under Minn. Stat. § 115C.021, subd. 1, a person is responsible for a release from a tank if that person owned or operated the tank any time during or after the release. If a person comes into possession of property where there has been a release after the tanks have been removed, that person is not a responsible person under the statutory definition and the Minnesota Pollution Control Agency (MPCA) cannot order that person to take corrective action under Minn. Stat. § 115C.

Liability is further limited for lenders. The Minn. Stat. § 115C.021, subd. 4, provides that a mortgagee is not responsible for a release from a tank solely because the mortgagee becomes an owner of real property where the tank is located through foreclosure or receipt of a deed in lieu of foreclosure.

This letter represents the views of the MPCA and is based on information disclosed to the MPCA as of the date hereof. Depending on your circumstances, it may or may not be construed as releasing any person from liability under state or federal laws. If you have questions concerning your particular situation, the MPCA recommends that you discuss your concerns with your legal counsel.

If future development of the Site or the surrounding area is planned, it should be assumed that petroleum contamination is present. Property with petroleum contamination to soil or groundwater may cause risks to future occupants. Brownfields staff can assist with environmental risk and development plan review, and will review, approve, and/or modify your plan for property development. If contamination is encountered during future development work, the MPCA should be notified immediately.

Alex Bushey and Brian Bosley

Page 2

April 15, 2022

This letter is subject to the disclaimers found in Attachment A. If you have any questions about the contents of this letter, please contact Brittney Schuller, Project Manager, at 651-757-2444 or brittney.schuller@state.mn.us.

Sincerely,

Brittney Schuller

This document has been electronically signed.

Brittney Schuller

Project Manager

Remediation Division

BS:df

Attachment

cc: Jenny Holmes, Northeast Technical Services Inc. (w/attachment) (electronic)

Disclaimers

Silver Rapids Lodge

MPCA Site ID: BF0002139

PIN: 28-6311-29850, 28-6311-32070

1. Reservation of authorities

The Minnesota Pollution Control Agency (MPCA) Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such actions if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release, or create an imminent and substantial danger to public health and welfare.

2. No MPCA assumption of liability

The MPCA, its Commissioner, and staff do not assume any liability for any release, threatened release, or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter based on current information

All statements, conclusions, and representations in this letter are based on information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion, or representation and to take any appropriate action under his/her authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer regarding use or development of the property

The MPCA, its Commissioner, and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer regarding investigative or response action at the property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

6. This approval does not supplant any applicable state or local stormwater permits, ordinances, or other regulatory documents.

August 2, 2022

VIA EMAIL

Brian Bosley
National Bank of Commerce
306 Superior Street
Duluth, MN 55802-1803

RE: Lender No Association Determination
Silver Rapids Lodge, 459 Kawishwi Trail, Ely
MPCA Site ID: BF0002139
Billing ID: 216487
PINs: 28-6311-29850, and 28-6311-32070

Dear Brian Bosley:

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) Program has received a request, dated June 9, 2022, on behalf of National Bank of Commerce for a No Association Determination for proposed actions to be conducted at the Silver Rapids Lodge site, located at 459 Kawishwi Trail (the Site). One or more releases or threatened releases of hazardous substances or pollutants or contaminants have been identified at the Site. The releases or threatened releases include tetrachloroethene in groundwater (Identified Release). This letter is in response to the request from National Bank of Commerce for a determination (Request) under Minn. Stat. § 115B.178, that the act of providing financing for the Site (the Proposed Actions) will not constitute actions that will associate National Bank of Commerce with the Identified Release at the Site.

The definition of a “responsible person” under the Minnesota Environmental Response and Liability Act (MERLA) is set forth in Minn. Stat. § 115B.03 (see Attachment B). The “owner” of real property where a release has occurred may be a responsible person under specified circumstances. Please note, however, that the definition of “owner of real property” in MERLA (see Attachment C) does not include a person holding a nonpossessory interest in real property (such as a security interest) unless and until the person’s interest in the real property vests in possession or the person obtains the unconditional right to possess or control the use of the real property. In the event that a mortgagee, holder of a security interest, or contract-for-deed vendor comes into possession of a property through foreclosure, receipt of deed in lieu of foreclosure, or termination of a contract-for-deed, additional liability protection has been afforded under Minn. Stat. § 115B.03, subds. 6 and 7 (see Attachment B). A lender that does not otherwise meet the definition of “responsible person” for a release or threatened release at a site does not become a responsible person solely by providing financing or acquiring the site through foreclosure, receipt of deed in lieu of foreclosure, or termination of a contract-for-deed.

Based on a review of the information provided to the MPCA and subject to the conditions set forth in this letter, a determination is hereby made pursuant to Minn. Stat. § 115B.178 that the act of providing financing for the Site does not and will not associate National Bank of Commerce with the Identified Release at the Site for the purpose of Minn. Stat. § 115B.03, subd. 3(4).

This determination is made in accordance with Minn. Stat. § 115B.178, and is subject to the following conditions:

- The Proposed Actions for which this determination shall apply is restricted to providing financing for the Site.
- National Bank of Commerce shall cooperate with the MPCA, its employees, contractors, and others acting at the MPCA's direction, in the event that the MPCA takes, or directs others to take, response actions at the Site to address the Identified Release or any other as yet unidentified release or threatened release of a hazardous substance, pollutant, or contaminant, including, but not limited to, granting access to the Site so that response actions can be taken.
- National Bank of Commerce shall avoid actions that contribute to the Identified Release or that interfere with response actions required under any MPCA-approved response action plan to address the release at the Site.
- National Bank of Commerce is not otherwise a responsible party as defined by Minn. Stat. § 115B.03 (see Attachment B).

Pursuant to Minn. Stat. § 115B.178, when National Bank of Commerce takes the Proposed Actions in accordance with the determinations in this letter, subject to the conditions stated herein, the Proposed Actions will not associate National Bank of Commerce with the Identified Release at the Site for the purpose of Minn. Stat. § 115B.03, subd. 3(4).

The determination made in this letter applies to National Bank of Commerce's successors and assigns if the successors and assigns: 1) are not otherwise responsible for the Identified Release at the Site; 2) do not engage in conduct associating themselves with the release; and 3) comply with the conditions set forth in this letter.

Please be advised that the determination made in this letter is subject to the disclaimers found in Attachment A and is contingent upon compliance with the conditions set forth herein. If you have any questions about the contents of this letter, please contact Andrew Nichols at 651-757-2612 or by email at andrew.nichols@state.mn.us.

Sincerely,



This document has been electronically signed.

Amy K. Hadjaris, P.G.
Supervisor
Remediation Division

AKH/AN:df

Attachments

cc: Alex M. Bushey, Iron Rock Development, LLC (w/attachment) (electronic)
Jenny Holmes, Northeast Technical Services Inc (w/attachment) (electronic)

Disclaimers

SILVER RAPIDS LODGE

MPCA Site ID: BF0002139

1. Reservation of authorities

The Minnesota Pollution Control Agency (MPCA) Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such actions if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release or create an imminent and substantial danger to public health and welfare.

2. No MPCA assumption of liability

The MPCA, its Commissioner, and staff do not assume any liability for any release, threatened release or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter based on current information

All statements, conclusions, and representations in this letter are based on information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion, or representation and to take any appropriate action under the Commissioner's authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer regarding use or development of the property

The MPCA, its Commissioner, and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer regarding investigative or response action at the property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

6. This approval does not supplant any applicable state or local stormwater permits, ordinances, or other regulatory documents.

Definition of "Responsible Person" under MERLA

(Minn. Stat. § 115B.03, subds. 1, 3, 5-7)

Minn. Stat. § 115B.03 Responsible Person.

Subdivision 1. General rule. For the purposes of sections 115B.01 to 115B.20, and except as provided in subdivisions 2 and 3, a person is responsible for a release or threatened release of a hazardous substance, or a pollutant or contaminant, from a facility if the person:

(1) owned or operated the facility:

(i) when the hazardous substance, or pollutant or contaminant, was placed or came to be located in or on the facility;

(ii) when the hazardous substance, or pollutant or contaminant, was located in or on the facility but before the release; or

(iii) during the time of the release or threatened release;

(2) owned or possessed the hazardous substance, or pollutant or contaminant, and arranged, by contract, agreement or otherwise, for the disposal, treatment or transport for disposal or treatment of the hazardous substance, or pollutant or contaminant; or

(3) knew or reasonably should have known that waste the person accepted for transport to a disposal or treatment facility contained a hazardous substance, or pollutant or contaminant, and either selected the facility to which it was transported or disposed of it in a manner contrary to law.

Subd. 2. Employees and employers. [language omitted]

Subd. 3. Owner of real property. An owner of real property is not a person responsible for the release or threatened release of a hazardous substance from a facility in or on the property unless that person:

(1) was engaged in the business of generating, transporting, storing, treating, or disposing of a hazardous substance at the facility or disposing of waste at the facility, or knowingly permitted others to engage in such a business at the facility.

(2) knowingly permitted any person to make regular use of the facility for disposal of waste;

(3) knowingly permitted any person to use the facility for disposal of a hazardous substance;

(4) knew or reasonably should have known that a hazardous substance was located in or on the facility at the time right, title, or interest in the property was first acquired by the person and engaged in conduct associating that person with the release; or

(5) took action which significantly contributed to the release after that person knew or reasonably should have known that a hazardous substance was located in or on the facility.

For the purpose of clause (4), a written warranty, representation, or undertaking, which is set forth in an instrument conveying any right, title or interest in the real property and which is executed by the person conveying the right, title or interest, or which is set forth in any memorandum of any such instrument executed for the purpose of recording, is admissible as evidence of whether the person acquiring any right, title, or interest in the real property knew or reasonably should have known that a hazardous substance was located in or on the facility.

Any liability which accrues to an owner of real property under sections 115B.01 to 115B.15 does not accrue to any other person who is not an owner of the real property merely because the other person holds some right, title, or interest in the real property. An owner of real property on which a public utility easement is located is not a responsible person with respect to any release caused by any act or omission of the public utility which holds the easement in carrying out the specific use for which the easement was granted.

Subd. 4. Tax-forfeited land. [language omitted]

Subd. 5. Eminent domain. [language omitted]

Subd. 6. Mortgages. (a) A mortgagee is not a responsible person under this section solely because the mortgagee becomes an owner of real property through foreclosure of the mortgage or by receipt of the deed to the mortgaged property in lieu of foreclosure.

(b) A mortgagee of real property where a facility is located or a holder of a security interest in facility assets or inventory is not an operator of the facility for the purpose of this section solely because the mortgagee or holder has a capacity to influence the operation of the facility to protect its security interest in the real property or assets.

Subd. 7. Contract for deed vendors. A contract for deed vendor who is otherwise not a responsible party for a release or a threatened release of a hazardous substance from a facility is not a responsible person under this section solely as a result of a termination of the contract for deed under section 559.21.

Definition of an "Owner of Real Property" under MERLA

Minn. Stat. § 115B.02 Definitions.

Subd. 11. Owner of real property. "Owner of real property" means a person who is in possession of, has the right of control, or controls the use of real property, including without limitation a person who may be a fee owner, lessee, renter, tenant, lessor, contract for deed vendee, licensor, licensee, or occupant; provided that:

(1) a lessor of real property under a lease which in substance is a financing device and is treated as such under the United States Internal Revenue Code, common law, or statute, is not an owner of the real property;

(2) a public utility holding a public utility easement is an owner of the real property described in the easement only for the purpose of carrying out the specific use for which the easement was granted;

(3) any person holding a remainder or other nonpossessory interest or estate in real property is an owner of the real property beginning when that person's interest or estate in the real property vests in possession or that person obtains the unconditioned right to possession, or to control the use of, the real property; and

(4) the state or an agency of the state is not an owner of real property solely because it holds title to the property in trust for taxing districts as a result of forfeiture of title for nonpayment of taxes.

AG:200540, v. 1

August 11, 2022

VIA EMAIL

Alex Bushey
Iron Rock Development, LLC
800B Railroad Street
Duluth, MN 55802-2645

RE: No Association Determination
Silver Rapids Lodge, 459 Kawishwi Trl, Ely
MPCA Site ID: BF0002139
Billing ID: 216487
PINs: 28-6311-29850, and 28-6311-32070

Dear Alex Bushey:

This letter is in response to the request from Jenny Holmes of Northeast Technical Services, Inc. for a determination under Minn. Stat. § 115B.178 that certain actions proposed to be taken by Iron Rock Development, LLC at the Silver Rapids Lodge site, located at the address referenced above (the Site), will not constitute conduct associating Iron Rock Development, LLC with the release or threatened release of hazardous substances, pollutants, or contaminants at the Site for the purpose of Minn. Stat. § 115B.03, subd. 3(4).

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) Program has reviewed the documents submitted for the Site. The Site is comprised of two parcels totaling almost 60 acres on White Iron and Farm Lakes near Ely, Minnesota. The Site was undeveloped woodland until the construction of the lodge in 1919. The Site is currently improved with a main lodge and restaurant building, rental cabins, a shop, a 40-person sauna, game room, boathouse, motel, and recreational vehicle (RV) park. Iron Rock Development, LLC intends to continue operating the Site as a vacation lodge.

A limited environmental investigation was completed at the Site in October 2021. Soil samples were collected from two borings and analyzed for diesel range organics (DRO), gasoline range organics (GRO), and volatile organic compounds (VOCs). Only petroleum contamination was detected in the soil samples. A groundwater sample was collected from one boring and analyzed for DRO, GRO, and VOCs. Tetrachloroethene (PCE) was detected in the groundwater sample at a concentration less than the Health Risk Limit (HRL) established by the Minnesota Department of Health.

For the purpose of this letter, the identified release consists of PCE in groundwater (Identified Release). This letter does not address petroleum-related contaminants. Petroleum contamination detected at the Site is under the oversight of the MPCA's Petroleum Brownfields Program.

Based on a review of the information provided to the MPCA VIC Program, and subject to the conditions set forth in this letter, a determination is hereby made pursuant to Minn. Stat. § 115B.178, subd. 1 that the proposed actions (Proposed Actions) listed below will not associate Iron Rock Development, LLC with the Identified Release for the purpose of Minn. Stat. § 115B.03, subd. 3(4). This determination applies only to the following Proposed Actions:

- Purchase of the Site
- Continued operation of a vacation resort at the Site
- Operation and maintenance of the Site building, grounds, and related infrastructure

This determination is made in accordance with Minn. Stat. § 115B.178, subd. 1, and is subject to the following conditions:

1. The Proposed Actions shall be carried out as described herein.
2. Iron Rock Development, LLC shall cooperate with the MPCA, its employees, contractors, and others acting at the MPCA's direction, in the event that the MPCA takes, or directs others to take, response actions at the Site to address the Identified Release or any other as yet unidentified release or threatened release of a hazardous substance, pollutant, or contaminant, including, but not limited to, granting access to the Site so that response actions can be taken.
3. Iron Rock Development, LLC shall avoid actions that contribute to the Identified Release or that interfere with response actions required under any MPCA-approved response action plan to address the Identified Release.
4. In the event that any suspected hazardous substances are encountered during Site activities (i.e., demolition, grading, redevelopment, etc.), Iron Rock Development, LLC shall notify the MPCA project staff immediately in order to determine appropriate handling, sampling, analysis, and disposal of such wastes.
5. Due to the PCE detection in groundwater near the cabins, a soil vapor investigation shall be completed at the Site, in accordance with the MPCA's Best Management Practices for Vapor Investigation and Building Mitigation Decisions. If soil vapor contaminants are detected at concentrations greater than the MPCA action levels, active vapor mitigation system(s) shall be installed in the Site building(s), in accordance with an MPCA-approved Response Action Plan, and an environmental covenant will be required to document the affirmative obligation to operate and maintain the vapor mitigation system(s).

Pursuant to Minn. Stat. § 115B.178, subd.1, when Iron Rock Development, LLC takes the Proposed Actions in accordance with the determination in this letter, subject to the conditions stated herein, the Proposed Actions will not associate Iron Rock Development, LLC with the Identified Release for the purpose of Minn. Stat. § 115B.03, subd. 3(4).

The determination made in this letter applies to Iron Rock Development, LLC's successors and assigns if the successors and assigns: 1) are not otherwise responsible for the Identified Release at the Site; 2) do not engage in activities with respect to the Identified Release which are substantially different from the activities which Iron Rock Development, LLC proposes to take, as described herein; and 3) comply with the conditions set forth in this letter.

Alex Bushey
Page 3
August 11, 2022

Please be advised that the determination made in this letter is subject to the disclaimers found in Attachment A and is contingent upon compliance with the terms and conditions set forth herein including completion of the soil vapor investigation and any required follow-up actions, based on the pending data.

If you have any questions about the contents of this letter, please contact Andrew Nichols, Project Manager, at 651-757-2612 or by email at andrew.nichols@state.mn.us.

Sincerely,



This document has been electronically signed.

Amy K. Hadjaris, P.G.

Supervisor

Voluntary Investigation and Cleanup Unit
Remediation Division

AKH/AN:df

Attachment

cc: Harold R. Langowski, City of Ely (w/attachment) (electronic)
Christine M. McCarthy, Lake County (w/attachment) (electronic)
Jenny Holmes, Northeast Technical Services (w/attachment) (electronic)

Disclaimers

Silver Rapids Lodge

MPCA Site ID: BF0002139

1. Reservation of authorities

The Minnesota Pollution Control Agency (MPCA) Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such actions if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release or create an imminent and substantial danger to public health and welfare.

2. No MPCA assumption of liability

The MPCA, its Commissioner, and staff do not assume any liability for any release, threatened release, or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter based on current information

All statements, conclusions, and representations in this letter are based on information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion, or representation and to take any appropriate action under his authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer regarding use or development of the property

The MPCA, its Commissioner, and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer regarding investigative or response action at the property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

6. This approval does not supplant any applicable state or local stormwater permits, ordinances, or other regulatory documents.

Appendix I – Ecological Resources



Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: Silver Rapids Resort

Project Proposer: Leisure Hotels and Resorts

Project Type: Development, Recreational/Entertainment

Project Type Activities: Tree Removal;Grading

TRS: T63 R11 S29, T63 R11 S32

County(s): Lake

DNR Admin Region(s): Northeast

Reason Requested: State EAW

Project Description: Expansion of the existing resort including the construction of 44 cabins and a lodge. (see attached site plan). Construction is planned to occur over three ...

Existing Land Uses: Existing resort as well as wooded land.

Landcover / Habitat Impacted: Predominantly wooded land.

Waterbodies Affected: No direct impacts to any water bodies are planned as part of the project. Delineated wetlands onsite and the adjoining White Iron and Farm lakes were all avoided in the site plan.

Groundwater Resources Affected: The existing resort is currently under the Silver Rapids Lodge Public Water Supply System (PWS #5380061). Additional groundwater appropriation will likely ...

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	Comments	Tree Removal - Recommendations
Ecologically Significant Area	Comments	MBS Sites - Recommendations Potential RNC under WCA Potential Local Conservation Value Lakes - Recommendations
State-Listed Endangered or Threatened Species	No Comments	No Further Review Required
State-Listed Species of Special Concern	Comments	Recommendations
Federally Listed Species	No Records	Visit IPaC For Federal Review



Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

February 20, 2026

Project ID: MCE #2026-00177

Jeremy Groskreutz
ISG
115 E Hickory St, Suite 300
Mankato, MN 56001

RE: Automated Natural Heritage Review of the proposed Silver Rapids Resort
See Cover Page for location and project details.

Dear Jeremy Groskreutz,

As requested, the above project has been reviewed for potential effects to rare features. Based on this review, the following rare features may be adversely affected by the proposed project:

Project Type and/or Project Type Activity Comments

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed below, all of Minnesota's bats, including the federally endangered northern long-eared bat ([*Myotis septentrionalis*](#)), can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or in crevices of both live and dead trees. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these impacts, the DNR recommends that tree removal be avoided from June 1 through August 15.

Ecologically Significant Area

- The Minnesota Biological Survey (MBS) has identified one or more Sites of Biodiversity Significance within or adjacent to the project boundary. Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Factors taken into account during the ranking process include the number of rare species documented within the site, the quality of the native plant communities in the site, the size of the site, and the context of the site within the landscape.

Potential RNC - One or more MBS Sites of Biodiversity Significance ranked Outstanding or High may be impacted by the proposed project. Please note that wetlands within MBS Sites of Biodiversity Significance ranked Outstanding or High may qualify as Rare Natural Communities under the Wetland Conservation Act (WCA). If the proposed project includes a wetland replacement

plan under WCA, please contact your [DNR Regional Ecologist](#) for further evaluation. For technical guidance on Rare Natural Communities, please visit [WCA Program Guidance and Information](#).

High or Moderate MBS Site - One or more MBS Sites of Biodiversity Significance ranked High or Moderate may be impacted by the proposed project. Sites ranked as High contain very good quality occurrences of the rarest species, high quality examples of the rare native plant communities, and/or important functional landscapes. Sites ranked as Moderate contain occurrences of rare species and/or moderately disturbed native plant communities, and/or landscapes that have a strong potential for recovery. The DNR recommends that the project be designed to avoid impacts to these ecologically significant areas. Actions to avoid or minimize disturbance include, but are not limited to, the following recommendations:

- Retain a buffer between proposed activities and the MBS Site,
- Minimize project footprint within the MBS Site,
- Operate within already-disturbed areas,
- Minimize vehicular disturbance within the MBS Site,
- Do not park equipment or stockpile supplies within the MBS Site,
- Do not place spoil within the MBS Site,
- Inspect and clean equipment prior to operating within the MBS Site, and follow other recommendations to [prevent the spread of invasive species](#),
- Conduct the work under frozen ground conditions,
- Use effective erosion prevention and sediment control measures,
- Revegetate disturbed soil with native [seed mixes](#) suitable to the local habitat as soon after construction as possible,
- Use only weed-free mulches, topsoils, and seed mixes.

Areas with Potential Local Conservation Value - The proposed project may impact one or more areas that have local conservation value. These areas are ranked as Below in the MBS Sites of Biodiversity Significance layer, and are retained in the layer as negative data. These areas do not meet the minimum biodiversity threshold for statewide significance but may have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat.

- One or more Lakes of Biological Significance may be impacted by the proposed project. [Lakes of Biological Significance](#) are high quality lakes based on the aquatic plant, fish, bird, or amphibian communities present within the lake. To be included in this layer, a lake only needs to meet the criteria for one of these four community types. The lake is assigned a biological significance of Outstanding, High, or Moderate based on the community with the highest quality. Given the ecological significance of these lakes, disturbance should be minimized during construction, operation, and maintenance activities. Actions to avoid or minimize disturbance include, but are not limited to, the following recommendations:
 - Avoid the removal of shoreline vegetation,
 - Implement stringent/redundant erosion prevention and sediment control practices,
 - Prevent the spread of invasive species,
 - Use only herbicides approved for application within shoreline/riparian areas,
 - Minimize use of fertilizer.

State-Listed Endangered or Threatened Species

No state-listed endangered or threatened species have been documented in the vicinity of the project.

State-Listed Species of Special Concern

Taxonomic Group	Common Name	Scientific Name	Water Regime	Habitat	Federal Status
Vertebrate Animal	Northern Sunfish	Lepomis peltastes		Littoral Zone of Lake	

- The above table identifies state-listed species of special concern that have been documented in the vicinity of your project. If suitable habitat for any of these species occurs within your project footprint or activity impact area, the project may negatively impact those species. To avoid impacting state-listed species of special concern, the DNR recommends modifying the location of project activities to avoid suitable habitat or modifying the timing of project activities to avoid the presence of the species. Please visit the [DNR Rare Species Guide](#) for more information on the habitat use of these species and recommended measures to avoid or minimize impacts. Species-specific comments, if any, appear below.

Federally Listed Species

The Natural Heritage Information System does not contain any records for federally listed species within one mile of the proposed project. Please note, however, that not all federally listed species are tracked within the NHIS. To ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online [Information for Planning and Consultation \(IPaC\) tool](#).

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and the project description provided on the cover page. If project details change or construction has not occurred within one year, please resubmit the project for review before initiating project activities.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential impacts to these rare features. For information on the environmental review process or other natural resource concerns, you may contact your [DNR Regional Environmental Assessment Ecologist](#).

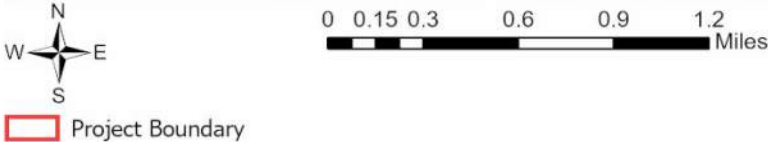
Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely, *The Natural Heritage Review Team* [Natural Heritage Review Program
Review.NHIS@state.mn.us](mailto:Review.NHIS@state.mn.us)

Links: USFWS Information for Planning and Consultation (IPaC) tool
[Information for Planning and Consultation \(IPaC\) tool](#)
DNR Regional Environmental Assessment Ecologist Contact Info
https://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

Silver Rapids Resort

Aerial Imagery With Locator Map



Project Type: Development, Recreational/Entertainment

Project Size (acres): 62.42

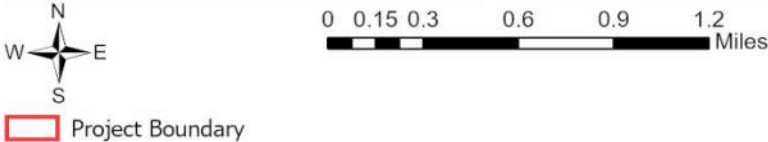
County(s): Lake

TRS: T63 R11 S29, T63 R11 S32

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Vantor
Province of Ontario, MN Dept Natural Resources, Esri Canada, Esri, TomTom,



Silver Rapids Resort
USA Topo Basemap With Locator Map



 Project Boundary

Project Type: Development, Recreational/Entertainment

Project Size (acres): 62.42

County(s): Lake

TRS: T63 R11 S29, T63 R11 S32

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Esri, NASA, NGA, USGS, FEMA
Province of Ontario, MN Dept Natural Resources, Esri Canada, Esri, TomTom,





United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793



In Reply Refer To:
Project Code: 2026-0064959
Project Name: Silver Rapids Lodge

03/19/2026 16:19:09 UTC

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Please refer to our [Section 7 website](#) for guidance and technical assistance, including [step-by-step instructions](#) for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A [demonstration video](#) showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of "no effect" or "may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species' biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a "Not Likely to Adversely Affect" (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a "May Affect" determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for "May Affect" determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of "There are no listed species found within the vicinity of the project," then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For projects that intersect with or are adjacent to Tribal lands: The Service has federal Trust responsibilities and a strong commitment to working with Tribal governments to help sustain fish and wildlife resources for future generations. Tribal governments should be provided with sufficient opportunity to express their perspectives and/or concerns for proposed projects. If your project intersects with Tribal lands or impacts culturally sensitive resources, please engage with the federally recognized Tribe to ensure they have an opportunity to provide input on this project.

Northern Long-Eared Bats

Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the [Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#).

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or

- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys help to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's [northern long-eared bat website](#).

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "[Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States](#)."

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a [permit](#). A [nest take permit](#) is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of [recommendations that minimize potential impacts to migratory birds](#). Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination

While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota

[Minnesota Department of Natural Resources - Endangered Resources Review Homepage](#)

Email: Review.NHIS@state.mn.us

Wisconsin

[Wisconsin Department of Natural Resources - Endangered Resources Review Homepage](#)

Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office

3815 American Blvd East

Bloomington, MN 55425-1659

(952) 858-0793

PROJECT SUMMARY

Project Code: 2026-0064959

Project Name: Silver Rapids Lodge

Project Type: Recreation - New Construction

Project Description: Leisure Hotels and Resorts is proposing construction of an expansion to the existing Silver Rapids Lodge resort site located in Fall Lake Township, Lake County, Minnesota. The project will include the construction of a new lodge, 44 new cabins, 10 campsites, as well as other amenities.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@47.9055465,-91.75750674260367,14z>



Counties: Lake County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Gray Wolf <i>Canis lupus</i> Population: MN There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4488	Threatened
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee <i>Bombus suckleyi</i> Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

CRITICAL HABITATS

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> https://ecos.fws.gov/ecp/species/3652#crithab	Final
Gray Wolf <i>Canis lupus</i> https://ecos.fws.gov/ecp/species/4488#crithab	Final

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act ² and the Migratory Bird Treaty Act (MBTA) ¹. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

-
1. The [Bald and Golden Eagle Protection Act](#) of 1940.
 2. The [Migratory Birds Treaty Act](#) of 1918.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your [project](#) area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the [National Bald Eagle Management Guidelines](#). You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#).

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

If disturbance or take of eagles cannot be avoided, an [incidental take permit](#) may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the [Do I Need A Permit Tool](#). For assistance making this determination for golden eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

Ensure Your Eagle List is Accurate and Complete

If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the [Supplemental Information](#)

[on Migratory Birds and Eagles](#), to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

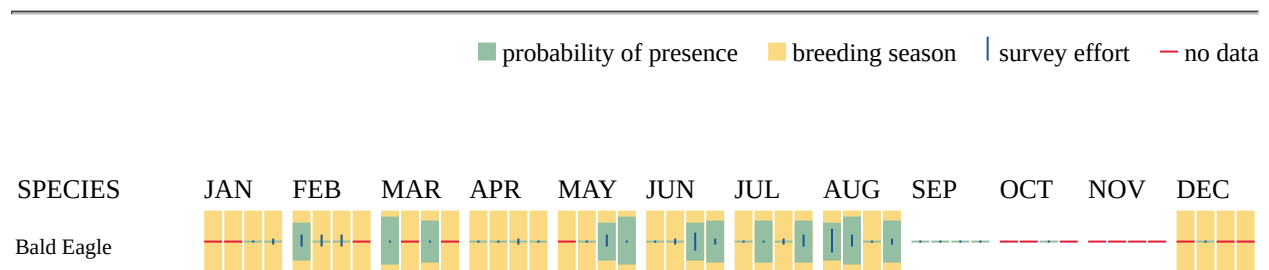
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Non-BCC
Vulnerable

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) ¹ prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10

NAME	BREEDING SEASON
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9643	Breeds May 20 to Aug 10
Connecticut Warbler <i>Oporornis agilis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9442	Breeds Jun 15 to Aug 10
Evening Grosbeak <i>Coccothraustes vespertinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9465	Breeds May 15 to Aug 10
Golden-winged Warbler <i>Vermivora chrysoptera</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Olive-sided Flycatcher <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Veery <i>Catharus fuscescens fuscescens</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11987	Breeds May 15 to Jul 15
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>

- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1D

LAKE

- L2UBH

IPAC USER CONTACT INFORMATION

Agency: ISG

Name: Jeremy Groskreutz

Address: 115 East Hickory Street, Suite 300

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Phone: 5073876651



United States Department of the Interior

FISH AND WILDLIFE SERVICE
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In Reply Refer To:
Project code: 2026-0064959
Project Name: Silver Rapids Lodge

03/19/2026 16:31:44 UTC

Subject: Technical Assistance letter for 'Silver Rapids Lodge' for specified threatened and endangered species that may occur in your proposed project location consistent with the Minnesota-Wisconsin Endangered Species Determination Key (Minnesota-Wisconsin DKey).

Dear Jeremy Groskreutz:

The U.S. Fish and Wildlife Service (Service) received on **March 19, 2026** your effect determination(s) for the 'Silver Rapids Lodge' (Action) using the Minnesota-Wisconsin DKey within the Service's Information for Planning and Consultation (IPaC) system. The Service developed this system in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 et seq.).

Based on your responses to the Service's Minnesota-Wisconsin DKey, you made the following effect determination(s) for the proposed Action:

Species	Listing Status	Determination
Canada Lynx (<i>Lynx canadensis</i>)	Threatened	May affect
Gray Wolf (<i>Canis lupus</i>)	Threatened	May affect
Monarch Butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	No effect

Critical Habitat	Listing Status	Determination
Canada Lynx (<i>Lynx canadensis</i>)	Final	May affect
Gray Wolf (<i>Canis lupus</i>)	Final	May affect

Determination Information

Coordination with the Service is not complete. Further coordination with the Minnesota-Wisconsin Ecological Services Field Office is recommended for those species with a determination of "May Affect," listed above. Please email our office at TwinCities@fws.gov and attach a copy of this letter, so we can discuss methods to avoid or minimize potential adverse effects to those species.

Additional Information

Sufficient project details: Please provide sufficient project details on your project homepage in IPaC (Define Project, Project Description) to support your conclusions. Failure to disclose important aspects of your project that would influence the outcome of your effects determinations may negate your determinations and invalidate this letter. If you have site-specific information that leads you to believe a different determination is more appropriate for your project than what the Dkey concludes, you can and should proceed based on the best available information.

Future project changes: The Service recommends that you contact the Minnesota-Wisconsin Ecological Services Field Office or re-evaluate the project in IPaC if: 1) the scope or location of the proposed Action is changed; 2) new information reveals that the action may affect federally listed species or federally designated critical habitat in a manner or to an extent not previously considered; 3) the Action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project changes are final or resources committed.

Species-specific information

Gray Wolf: Please notify the Service if there is observed gray wolf activity in close proximity to the project site, especially if it could indicate a den or rendezvous site.

Canada Lynx: Canada lynx may be present in the Action area. Projects have potential to affect lynx if they may harm the species directly (e.g., mammal trapping, poison bait, etc.), indirectly (e.g., removes more than 30 acres of forest; likely to significantly reduce snowshoe hare density over a 30-acre area), or change lynx habitat quality, quantity, or availability. **Please coordinate with the Minnesota-Wisconsin Ecological Services Field Office to further evaluate effects of the Action on Canada.**

Critical Habitat: You have indicated that your Action may affect a Critical Habitat. Adversely affecting Critical habitat of a threatened or endangered species can have adverse effects on the species itself. **Please coordinate with the Minnesota-Wisconsin Ecological Services Field Office to further evaluate effects of the Action on Critical Habitat.**

Bald and Golden Eagles: Bald eagles, golden eagles, and their nests are protected under the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d) (Eagle Act). The Eagle Act prohibits, except when authorized by an Eagle Act permit, the “taking” of bald and golden eagles and defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” The Eagle Act’s implementing regulations define disturb as “... to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

If you observe a bald eagle nest in the vicinity of your proposed project, you should follow the [National Bald Eagle Management Guidelines \(May 2007\)](#). For more information on eagles and conducting activities in the vicinity of an eagle nest, please visit our [regional eagle website](#) or

contact Margaret at Margaret.Martin@fws.gov. If the Action may affect bald or golden eagles, additional coordination with the Service under the Eagle Act may be required.

Additional Species Requiring Review

In addition to the species described above, the following species or critical habitats may also occur in your project area and are not covered by this conclusion:

- Northern Long-eared Bat *Myotis septentrionalis* Endangered
- Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Proposed Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

Coordination with the Service is not complete if additional coordination is advised above for any species.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Silver Rapids Lodge

2. Description

The following description was provided for the project 'Silver Rapids Lodge':

Leisure Hotels and Resorts is proposing construction of an expansion to the existing Silver Rapids Lodge resort site located in Fall Lake Township, Lake County, Minnesota. The project will include the construction of a new lodge, 44 new cabins, 10 campsites, as well as other amenities.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@47.9055465,-91.7575067,4260367,14z>



QUALIFICATION INTERVIEW

1. This determination key is intended to assist the user in evaluating the effects of their actions on Federally listed species in Minnesota and Wisconsin. It does not cover other prohibited activities under the Endangered Species Act (e.g., for wildlife: import/export, Interstate or foreign commerce, possession of illegally taken wildlife, etc.; for plants: import/export, reduce to possession, malicious destruction on Federal lands, commercial sale, etc.) or other statutes. Additionally, this key DOES NOT cover wind development, purposeful take (e.g., for research or surveys), communication towers that have guy wires or are over 450 feet in height, aerial or other large-scale application of any chemical (such as insecticide or herbicide), and approval of long-term permits or plans (e.g., FERC licenses, HCP's).

Click **YES** to acknowledge that you must consider other prohibitions of the ESA or other statutes outside of this determination key.

Yes

2. Is the action being funded, authorized, or carried out by a Federal agency?

No

3. Is the action being conducted by or on behalf of a Federally recognized Tribe?

No

4. Does the action involve the installation or operation of wind turbines?

No

5. Does the action involve purposeful take of a listed animal?

No

6. Does the action involve a new communications tower?

No

7. Does the activity involve aerial or other large-scale application of ANY chemical, including pesticides (insecticide, herbicide, fungicide, rodenticide, etc)?

No

8. Will your action permanently affect local hydrology?

No

9. Will your action temporarily affect local hydrology?

No

10. Will your project have any direct impacts to a stream or river (e.g., Horizontal Directional Drilling (HDD), hydrostatic testing, stream/road crossings, new stormwater outfall discharge, dams, other in-stream work, etc.)?

No

11. Does your project have the potential to impact the riparian zone or indirectly impact a stream/river (e.g., cut and fill; horizontal directional drilling; construction; vegetation removal; pesticide or fertilizer application; discharge; runoff of sediment or pollutants; increase in erosion, etc.)?

Note: Consider all potential effects of the action, including those that may happen later in time and outside and downstream of the immediate area involved in the action.

Endangered Species Act regulation defines "effects of the action" to include all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (50 CFR 402.02).

No

12. Will your action disturb the ground or existing vegetation?

Note: This includes any off-road vehicle access, soil compaction (enough to collapse a rodent burrow), digging, seismic survey, directional drilling, heavy equipment, grading, trenching, placement of fill, pesticide application (herbicide, fungicide), vegetation management (including removal or maintenance using equipment or prescribed fire), cultivation, development, etc.

Yes

13. Will your action include spraying insecticides?

No

14. Does your action area occur entirely within an already developed area?

Note: Already developed areas are already paved, covered by existing structures, manicured lawns, industrial sites, or cultivated cropland, AND do not contain trees that could be roosting habitat. Be aware that listed species may occur in areas with natural, or semi-natural, vegetation immediately adjacent to existing utilities (e.g. roadways, railways) or within utility rights-of-way such as overhead transmission line corridors, and can utilize suitable trees, bridges, or culverts for roosting even in urban dominated landscapes (so these are not considered "already developed areas" for the purposes of this question). If unsure, select NO..

No

15. Is there any potential for this action to harm Canada lynx directly (e.g., mammal trapping, poison bait, broadcasting disease control agents for wild animals, capturing animals for research projects, or regular human activity that may exclude lynx from forested habitat including blasting or explosives)?

Yes

16. Is there any potential for the action to harm wolves directly (e.g., mammal trapping, poison bait), or indirectly (e.g., increasing vehicle use that may result in vehicle strikes, exposure to potential human persecution)?

Yes

17. [Hidden Semantic] Does the action area intersect the Threatened gray wolf AOI?

Automatically answered

Yes

18. [Hidden Semantic] Does the action area intersect the WOLF CH?

Automatically answered

Yes

19. Will the action result in permanent changes to Gray Wolf habitat quality, quantity, or availability? (e.g. permanent conversion of forested habitat, new highways, etc.)

Yes

20. [Hidden Semantic] Does the action area intersect the monarch butterfly species list area?

Automatically answered

Yes

21. Under the ESA, monarchs remain warranted but precluded by listing actions of higher priority. The monarch is a candidate for listing at this time. The Endangered Species Act does not establish protections or consultation requirements for candidate species. Some Federal and State agencies may have policy requirements to consider candidate species in planning. We encourage implementing measures that will remove or reduce threats to these species and possibly make listing unnecessary.

If your project will have no effect on monarch butterflies (for example, if your project won't affect their habitat or individuals), then you can make a "no effect" determination for this project.

Are you making a "no effect" determination for monarch?

Yes

IPAC USER CONTACT INFORMATION

Agency: ISG

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State: MN

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Phone: 5073876651



United States Department of the Interior

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In Reply Refer To:
Project code: 2026-0064959
Project Name: Silver Rapids Lodge

03/19/2026 16:43:26 UTC

Federal Nexus: no
Federal Action Agency (if applicable):

Subject: Technical assistance for 'Silver Rapids Lodge'

Dear Jeremy Groskreutz:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on March 19, 2026, for 'Silver Rapids Lodge' (here forward, Project). This project has been assigned Project Code 2026-0064959 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your project, the Project may need to apply the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office***

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the following effect determination(s):

Species	Listing Status	Determination
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Endangered	NLAA
Tricolored Bat (<i>Perimyotis subflavus</i>)	Proposed	NLAA
	Endangered	

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Canada Lynx *Lynx canadensis* Threatened
- Gray Wolf *Canis lupus* Threatened
- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Proposed Endangered

Critical Habitats:

- Canada Lynx *Lynx canadensis* Threatened
- Gray Wolf *Canis lupus* Threatened

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the Minnesota-Wisconsin Ecological Services Field Office and reference Project Code 2026-0064959 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Silver Rapids Lodge

2. Description

The following description was provided for the project 'Silver Rapids Lodge':

Leisure Hotels and Resorts is proposing construction of an expansion to the existing Silver Rapids Lodge resort site located in Fall Lake Township, Lake County, Minnesota. The project will include the construction of a new lodge, 44 new cabins, 10 campsites, as well as other amenities.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@47.9055465,-91.75750674260367,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

Automatically answered

No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

Automatically answered

No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Note for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer ‘yes’ to this question.

No

6. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum or winter roost? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

Automatically answered

No

7. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

No

8. Does the action area contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs?

No

9. Will the action cause effects to a bridge?

Note: Covered bridges should be considered as bridges in this question.

No

10. Will the action result in effects to a culvert or tunnel at any time of year?

No

11. Are trees present within 1000 feet of the action area?

Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

12. Does the action include the intentional exclusion of bats from a building or building-like structure? **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

No

13. Does the action involve removal, modification, or maintenance of a human-made building-like structure (barn, house, or other building) **known or suspected to contain roosting bats?**

No

14. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

15. Will the action include or cause any construction or other activity that is reasonably certain to increase average night-time traffic permanently or temporarily on one or more existing roads? **Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

No

16. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

17. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

Note: For information regarding NSF/ANSI 60 please visit <https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects>

No

18. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

19. Will the action include drilling or blasting?

No

20. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use at night)?

No

21. Will the proposed action involve the use of herbicides or pesticides (e.g., fungicides, insecticides, or rodenticides)?

No

22. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

23. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable forested northern long-eared bat or tricolored bat roosting habitat? **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

24. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

Yes

25. Is the project related to the production of coal, including projects that support the mining of coal, as well as the production and/or distribution of energy produced from coal?

No

26. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

No

27. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

No

28. Does the project intersect with the 0- 9.9% forest density category?

Automatically answered

No

29. Does the project intersect with the 10.0- 19.9% forest density category map?

Automatically answered

No

30. Does the project intersect with the 20.0- 29.9% forest density category map?

Automatically answered

No

31. Does the project intersect with the 30.0- 100% forest density category map?

Automatically answered

Yes

32. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 100 acres in total extent?

No

33. Will the proposed action result in the use of prescribed fire?

Note: If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

No

34. Does the action area intersect the northern long-eared bat species list area?

Automatically answered

Yes

35. [Semantic] Is the action area located within 0.5 miles of radius of an entrance/opening to any known NLEB hibernacula or winter roost? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

36. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

37. [Semantic] Is the action area located within 150 feet of a documented northern long-eared bat roost site?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency. Have you contacted the appropriate agency to determine if your action is within 150 feet of any documented northern long-eared bat roosts?

Note: A document with links to Natural Heritage Inventory databases and other state-specific sources of information on the locations of northern long-eared bat roosts is available here. Location information for northern long-eared bat roosts is generally kept in state natural heritage inventory databases – the availability of this data varies by state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited.

Automatically answered

No

38. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?

If unsure, answer "Yes."

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

39. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

40. Will any tree cutting/trimming or other knocking or bringing down of trees occur during the **Fall Swarming season** for northern long-eared bats in the action area? **Note:** Bat activity periods for your state can be found in Appendix 2 of the Service's [Northern long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects](#).

No

41. Will any tree cutting/trimming or other knocking or bringing down of trees occur during the **Spring Staging** season for northern long-eared bats in the action area? **Note:** Bat activity periods for your state can be found in Appendix 2 of the Service's [Northern long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects](#).

No

42. Will any tree cutting/trimming or other knocking or bringing down of trees occur during the **Summer Occupancy season** for northern long-eared bats in the action area? **Note:** Bat activity periods for your state can be found in Appendix 2 of the Service's [Northern long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects](#).

No

43. Does the action area intersect the tricolored bat species list area?

Automatically answered

Yes

44. Is the action area located within 0.5-mile of radius of an entrance/opening to any known tricolored bat hibernacula or winter roost?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

Automatically answered

No

45. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

46. Has a presence/probable absence bat survey targeting the [tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#) been conducted within the project area?

No

47. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?

(If unsure, answer ""Yes."")

Note: If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the [Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines](#).

Yes

48. Do any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pine trees)?

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

49. Will any tree cutting/trimming or other knocking or bringing down of trees be conducted during the Pup Season for tricolored bat? **Note:** Bat activity periods for your state can be found in Appendix 2 of the Service's [Northern Long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Developmental Projects](#).

No

50. Do you have any documents that you want to include with this submission?

No

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

6.6

IPAC USER CONTACT INFORMATION

Agency: ISG

Name: Jeremy Groskreutz

Address: 115 East Hickory Street, Suite 300

City: Mankato

State: MN

Zip: 56001

Email: jeremy.groskreutz@isginc.com

Phone: 5073876651

Appendix J – Greenhouse Gas Calculations



ISGHG Calculator

Version 0.1

Last Updated: 8/3/22

Project Name	Silver Rapids Lodge
Reviewer	Jeremy Groskreutz
Date	6/4/2026
State	MN
County	Lake
Project Lifespan	50

Emission Sources	Greenhouse Gases Emitted	CO2e TPY Emitted
Stationary Sources	-/-	-/-
Mobile Sources	CO2, CH4, and N2O	943.43
Off-Site Purchased Energy	CO2, CH4, and N2O	443.87
Purchased Steam/Heat	-/-	-/-
Waste Management	CO2	68.00
Purchased Gases	-/-	-/-

Mitigation Sources	Greenhouse Gases Mitigated	CO2e TPY Mitigated
Land-Use Mitigation	-/-	-/-
Renewable Energy Credits	-/-	-/-

Emissions - Mitigations =	Total CO2e TPY Emitted
	1,455.30

>25,000 TPY CO2e Emitted?	No
>100,000 TPY CO2e Emitted?	No

Emission Source	Project Phase	Emissions Scope
Stationary Sources	-/-	-/-
Mobile Sources	Operations	Scope-1
Off-Site Purchased Energy	Operations	Scope-2
Purchased Steam/Heat	-/-	-/-
Waste Management	Operations	Scope-3
Purchased Gases	-/-	-/-
Mitigation Source	Project Phase	Emissions Scope
Land-Use Mitigation	-/-	-/-
Renewable Energy Credits	-/-	-/-

Known Gases Emitted	kg Emitted Yearly	Short Tons Emitted Yearly
CO2	1,254,174.04	1,382.50
CH4	55.53	0.06
N2O	9.97	0.01

Stationary Source Emissions

ID	Phase	Fuel Type	Generator Type	Hours Operated	Fuel Spent Daily	mmBtu Output
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

ID	Phase	kg CO2 Produced	kg CH4 Emitted	kg N2O Emitted	kg CO2e Daily	CO2e TPY
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Federal Register EPA; 40 CFR Part 98; e-CFR, Table C-1, Table C-2 (as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).

Total Stationary Source Emissions	
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Mobile Source Emissions

ID	Phase	Vehicle Type	Fuel Type	Year	Yearly mi	MPG	Ga Used (Off-Road)
1	Op.	Passenger Cars	Gasoline	2019	12,045.00	25	
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

ID	# Veh.	kg CO2 Emitted	kg CH4 Emitted	kg N2O Emitted	kg CO2e Yearly	CO2e TPY
1	213	854,391.12	13.08	3.85	855,865.05	943.43
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Total Mobile Source Emissions	943.43
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Offsite Purchased Energy Emissions

eGRID Subregion	Yrly. Energy Usage	kg CO2e Emitted	kg CH4 Emitted	kg N2O Emitted
MROW (MRO West)	900.00	399,782.93	42.45	6.12

kg CO2e Emitted	CO2e TPY
402,668.55	443.87

Offsite Steam and Heat Emissions

mmBtu Purchased Yrly.	kg CO2 Emitted	kg CH4 Emitted	kg N2O Emitted	kg CO2e Emitted

CO2e TPY

Waste Management Emissions

ID	Waste Type	Disposal Method	Tons Disposed Yrly	CO2e TPY
1	Mixed MSW	Landfilled	118.625	68.00
2				
3				
4				
5				
6				
7				
8				
9				
10				

Total CO2e TPY
68.00

General/Refridgerative Gases

ID	Gas	Gas (lb)	GWP	CO2e (lb)	CO2e (Tons)
1					
2					
3					
4					
5					

100yr GWPs from IPCC 4th Assessment Rerport (AR4), 2007.

Blended Refridgerative Gases

ID	Gas	Gas (lb)	GWP	CO2e (lb)	CO2e (Tons)
1					
2					
3					
4					
5					

100yr GWPs from IPCC 4th Assessment Rerport (AR4), 2007.

Tot. CO2e TPY

Land-based Mitigation

ID	Restoration	Acreage	Sequest. Rate (Mton/Acre/Yr)	Total Seques. (MTon/Yr)	CO2e TPY
1					
2					
3					
4					
5					

Tot. CO2e TPY

Renewable Energy Credits

Credits Bought	eGrid Subregion	kg CO2 Mitigated	kg CH4 Mitigated	kg N2O Mitigated
	MROW (MRO West)			

kg CO2e Mitigated	CO2e TPY Mitig.