County	Public Service	Name
Chippewa	Ambulance Service	Clara City Ambulance
		Montevideo Ambulance Department
		Prinsburg Ambulance
	Fire Department	Clara City Fire Department
		Granite Falls Fire Department
		Maynard Fire Department
		Montevideo Fire Hall
		Watson Fire Department
	Hospital	CCM Health
		CCM Health: Emergency Services
		Granite Falls Clinic
		Granite Falls Health: Emergency and Health Center
		Montevideo Hospital and Clinic
		Municipal Hospital
	Law Enforcement	Chippewa County Sheriff
		Montevideo Police Department
Kandiyohi	Ambulance Services	Atwater Ambulance Services
		Spicer Ambulance Services
		Sunburg Ambulance Services
	Fire Departments	Atwater Fire Department
		Kandiyohi Fire Department & First Responders
		Lake Lilian Fire Department
		New London Fire Department
		Pennock Fire Department
		Prinsburg Fire Department
		Raymond Fire Department
		Sunburg Fire Department
		Willmar Fire Department
	Hospitals	Carris Health - Rice Memorial Hospital
		CentraCare - Wilmar Clinic
		CentraCare - Wilmar Lakeland Clinic
	Law Enforcement	Wilmar Police Department

County	Public Service	Name
Lyon	Ambulance Services	North Ambulance Marshall
		Tracy Ambulance Services Inc. Ambulance
	Fire Departments	Balaton Fire Department
		Cottonwood Fire Department
		Garvin Fire Hall
		Lynd Fire Department
		Marshall Fire Department
		Minneota City Fire Hall
		Russel Fire Department
		Tracy Fire Department
	Hospitals	Access Health and Avera Medical Group in Marshall - Carlson Street
		Avera Marshall Regional Medical Center
		Mecca Medical Center
		Sanford Tracy Medical Center
	Law Enforcement	Lyon County Police Department
		Lyon County Sheriff Office
		Minneota City Police Office
		Tracy Police Department
Meeker	Ambulance Services	Cosmos Ambulance
		Watkins Ambulance Services
	Fire Departments	Cosmos Fire Department
		Eden Valley Fire Department
		Grove City Fire Hall
		Litchfield Fire Department
		Watkins Fire Department
	Hospitals	Meeker Memorial Hospital and Clinic
	Law Enforcement	Litchfield Police
		Meeker County Jail

Xcel Energy®

ENERGY SAFETY FOR EMERGENCY RESPONDERS

GUIDANCE FOR RECOGNIZING POTENTIAL HAZARDS INVOLVING WORK AROUND ELECTRICITY

TABLE OF CONTENTS

INTRODUCTION

At Xcel Energy, safety is our number one priority. We appreciate the emergency responders who are committed to keeping our customers and communities safe in the eight states where we operate.

When a 911 operator receives a call reporting an energy-related emergency, such as a downed power line, you and your fellow emergency responders are often first on the scene. This book provides important energy-safety guidance from Xcel Energy for police officers, firefighters, and other first responders to help you stay safe when you are first to arrive on the scene of an energy emergency.

Your safety is important to us, and we encourage you to follow the guidance provided in this booklet. These resources will help you recognize potential hazards involving electricity, as well as provide guidelines to help keep you, your co-workers, the public, and our employees safe.

Just as you have been trained and know your jobs well, our employees receive extensive, ongoing training, making them uniquely qualified to respond safely to electrical emergencies. When a situation requires electric crews, please call our electricity emergency numbers (see Contacts and Resources section for numbers). We encourage our customers and community partners to call us to report any outage in your area so we can pinpoint the equipment involved and assign crews accordingly.

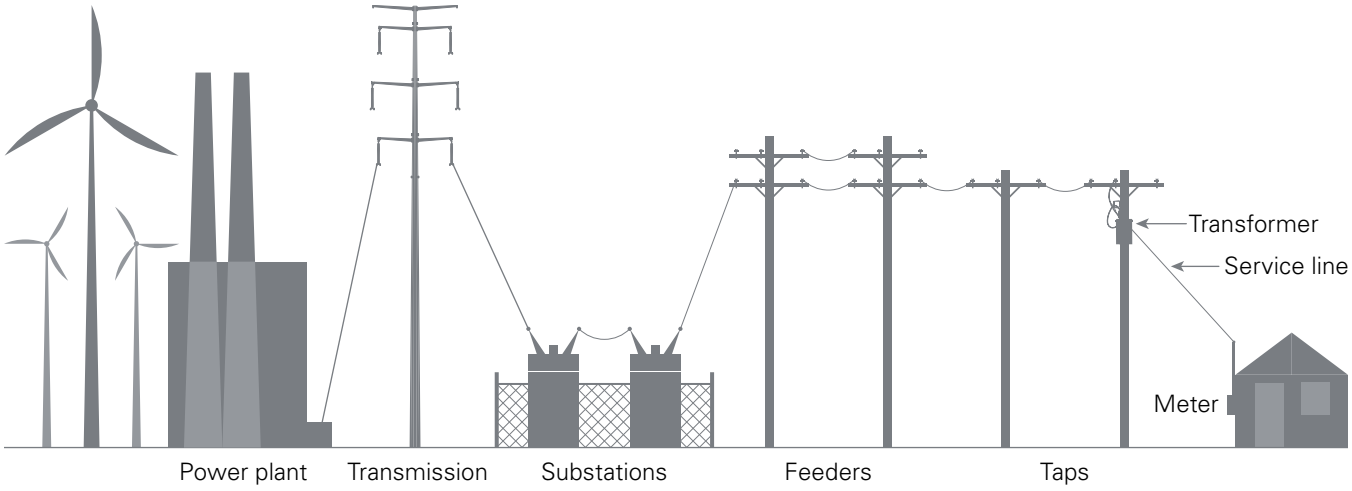
If you have any questions about how to stay safe around energy lines or would like additional information, please contact Public Safety team **publicsafety@xcelenergy.com**. Please forward this information to the appropriate people on your staff to ensure they have the correct numbers on record.

Please note that Xcel Energy may not be the electric or natural gas service provider in your area. While you should be sure to reach out to your local energy service provider in emergencies, the safety information contained in this book is still valuable to you and your team. In some cases, you may provide mutual aid to a neighboring municipality that we do service.

ELECTRIC SAFETY

The presence of any electrical hazard can alter rescue operations and require tactical changes. Responders must quickly size-up the electrical hazards present at the scene and develop actions to reduce, avoid or eliminate those hazards. To fully understand the hazards you are dealing with, it helps to know how the electric distribution system works.

How the electric distribution system works



Power is carried to homes or businesses through an electric distribution system. Electricity is generated at a power plant and distributed by high-voltage transmission lines through various distribution systems until it reaches homes or businesses.

1. Power plants generate energy and distribute it to substations via high-voltage transmission lines.
2. Transmission lines are used to distribute power to strategically located area substations that may serve one or multiple communities.
3. Substations distribute power to major power lines called feeders.
4. A feeder takes power from the substation and distributes it throughout an area serving several hundred to several thousand customers.
5. Taps are lines branching off feeders and typically serve 40 to 400 customers, including businesses and residential neighborhoods.
6. Transformers convert electrical power from high-voltage to the lower voltages used in homes or businesses. They typically serve individual buildings for commercial customers and several customers on the residential side.

Xcel Energy repairs power lines as safely and as rapidly as possible, working around the clock until power is restored to all customers. We give top priority to situations that threaten public safety, such as live downed wires. After that, repairs are prioritized based on what will quickly restore power to the largest number of customers.

Typically, we repair transmission lines first, because they serve the largest number of customers. Next we repair feeder lines, which serve thousands of customers, followed by tap lines (40 to 400 customers), transformers, and individual service wires.

Electric safety guidelines

Please review these guidelines for recognizing potential hazards involving electrical lines and help keep you, your co-workers, the public, and our employees safe:

Do

- Ensure your dispatch has communicated the electric emergency to Xcel Energy.
- Keep bystanders away.
- Position apparatus a minimum of 10 feet away from distribution wires, with greater distances required for higher voltage wires.
- Wait for Xcel Energy to arrive.
- Assume all lines are hot; consider them energized or live, as is anything they are touching. Always stay away!
- Anticipate potential ignition sources—they can be anywhere.
- Expect the electric system to try to re-energize. Our system is designed to keep electricity flowing. It locks out, or stops flow, after a few consecutive tries to rid the system of a problem, such as tree limbs blowing into lines, etc. When a problem persists, the system locks out.
- Follow your department's standard operating procedures (SOP) for pulling breakers/electric mains.

Do not

- Become a victim yourself.
- Remove fallen wires from vehicles, etc.
- Disconnect electrical services.
- Remove electric meters.
- Open transformers or switch cabinet secondary pedestals (green metal or fiberglass boxes).
- Enter substations unescorted.

Downed wires and structure fires

- Always establish a safe clearance for downed lines—a minimum of one full span between two structurally sound poles.
- Position apparatus emergency trucks safely. Watch for downed lines and lines that could fail with potential to hit apparatus.
- Keep aerial equipment a minimum of 10 feet from distribution wires and further for high voltage wires.
- Only Xcel Energy qualified electrical personnel should use rubber gloves, dielectric overshoes and special equipment for handling energized equipment. Pike poles are not the same as insulated and regularly tested utility fiberglass sticks.
- Never pull meters.
- Never cut wires.
- Never cut or remove padlocks from transformer or switch cabinets.

Electric equipment fires

- Never enter a substation, switchyard or generation plant fire, or attempt to fight one. Ensure utility company has been contacted and wait for utility personnel.
- As necessary, provide fire suppression to prevent fire from spreading to adjacent areas and facilities. Look up first for overhead lines before starting suppression.

  — Transformers can explode.

  — Arcing can kill.
- Maintain clearances from damaged or burning underground utilities, pad-mounted transformers or switch-cabinets. Treat vehicle collisions with electrical equipment the same as car/pole collisions. The vehicle's chassis may become energized along with other conductive objects.

Tactical use of hose streams

- In the event of a life-threatening emergency rescue, emergency responders may request an outage from the local utility provider.
- Wait for trained electric utility personnel to de-energize any equipment before any operations begin.
- Avoid using water until you are advised to proceed by electric utility personnel.
- If water is used, you must use fog at 30 degrees or wider (100 psi at nozzle) applied from at least 33 to 35 feet, or 10 meters.
- Protect exposures and let the fire burn. Monitor the runoff.
- Never use straight streams.
- Never spray energized equipment.

Rescue

- In car/pole collisions, if electrical hazards are present (lines down), have victims remain in the car, if possible, and wait for electric utility personnel.
- If it's possible for the driver to move the vehicle away from fallen lines, first consider if movement will increase risk to area by pulling more lines down.
- Keep others far away from the collision site.
- If victims are free from life-threatening injuries, have them stay in the vehicle and keep others back, including you. Reassure the victims that it will be safest for them to stay in the vehicle.
- If victims must exit the vehicle, follow step potential safety procedures. Instruct them to jump clear without touching the vehicle and ground at same time. They must shuffle or hop away to avoid step potential.
- Use protective shields, barriers or alerting techniques to protect firefighters and bystanders from electrical hazards and energized areas.
- Treat vehicle/pad-mount collisions the same as car/pole collisions. The vehicle's chassis and surrounding area may be energized. Wait for utility personnel to verify equipment is dead before rescue is attempted.
- Remove vehicle only after equipment is determined to be de-energized.

FIRE SAFETY RESPONSE FOR SUBSTATION EMERGENCIES

All operations involving Xcel Energy substations require de-energizing the affected equipment and isolating the surrounding area. If entry is deemed necessary by a unified command team, emergency personnel should be guided by Xcel Energy substation electricians.

Decision making for high voltage/substation emergencies

The initial task during high voltage emergencies involving Xcel Energy substations is to determine the tactical action plan. This is done by assessing the incident's potential.

The incident commander (IC), based on input from Xcel Energy, should estimate the likely outcome of the emergency and select the overall operating strategy to favorably impact this outcome.

Pre-planning for substation emergencies will help identify response strategies and tactics, as determined by representatives from both the emergency services and local utility companies, like Xcel Energy. The absence of a preplan for a substation or generation plant emergency raises the risk of disaster and injury.

Strategy and tactics for substation emergencies

Strategy is an important step of the response effort. Strategic goals should be general in nature, such as life preservation, incident stabilization, environmental impact, and utility service restoration. Examples of common strategic goals at utility emergencies could include the following:

- Rescue (if possible and can be done safely)
- Public protective actions (isolate downed wires, arc safety and downwind evacuation)
- Preventing cooling oil from impacting the environment
- Controlling the spread of oil around the substation
- Fire suppression and control
- Safety during restoration operations

Tactics are action-specific and implemented to achieve the strategic goals. Tactics could include:

- Protecting in place vs. evacuating
- Use extinguishing agents rather than water spray
- Cooling exposures from radiant heat

Operational modes

Mitigating utility emergencies requires implementation of an overall operational mode. The three modes are nonintervention, defensive and offensive. Criteria for evaluating operational modes include the level of resources available (e.g. personnel and equipment), level of training and capabilities of the emergency responders, and the potential harm created by the incident.

Nonintervention
"No action" is taken. The risks of intervening are unacceptable when compared to the dangers of fighting the electrical fire. All personnel are withdrawn to a safe location.

Defensive
Conditions indicate that the defensive actions chosen will buy time, enabling the response effort to be directed towards limiting the overall spread of the problem.

Offensive
The offensive mode must never be initiated without local utility provider substation electricians present to advise the responder. All operations must be done in conjunction with, and under the direct supervision of, substation personnel.

Substation fire response

The overall mission of an emergency response involving Xcel Energy substations is always to:

1. Protect lives.
2. Establish a protective perimeter around the substation, protecting surrounding structures: DO NOT enter or extinguish any substation equipment until receiving authorization from Xcel Energy substation personnel.
3. Assist Xcel Energy in efforts to stabilize the incident, as directed/needed.

Responders must use extreme caution around high voltage areas due to the severe electric hazards. High voltages in these sites can exceed 500,000 volts, or 500 kilovolts (kV), and operating amperages (A) of 1000A or more. Substations contain transformers, circuit breakers, switch gear, capacitors, bus bars (large diameter, non-insulated metal conductors), and large banks of batteries to control power in control rooms.

Electrical emergencies at Xcel Energy substations should be approached cautiously. Responders should wait for Xcel Energy personnel to arrive before initiating any type of offensive actions (see note 2 above). Since there is extreme risk to responders during high voltage emergencies, decisions must be made by the emergency services incident command in conjunction with Xcel Energy's incident commander. Unified command is critical in these types of operations.

Caution

Substations can contain a great deal of oil. It is used for cooling transformers and as an arc suppression agent while opening a circuit breaker. In some facilities the oil reservoir can be large, or stored indoors.

When there is a fire or damage to oil-cooled equipment, an oil spill can result. Regular hazardous materials tactics can be employed if the area is free from any energized equipment. Most utilities have eliminated the polychlorinated biphenyl (PCB) problem in their cooling oils; however, the real hazards are the flammability of heated oils and the ever-present danger of energized equipment.

Pre-planning questions

- **What type of incident is it?**
  Is it a generation substation or distribution substation incident? Is the equipment visible from the outside, or is it inside a surrounding wall or building?
- **Are all safety considerations identified?**
  Have all electrical safety hazards or considerations associated with the event been identified? Has the site been de-energized and verified by Xcel Energy substation electricians? Can the emergency area be isolated from electricity, and is it of a magnitude that would allow operations without fear of runoff, steam, or extinguishing agent contacting energized equipment and causing an arc?
- **Is there an electrical hazard still present?**
  Even though the immediate area has been de-energized, equipment nearby may remain energized.
- **What is the location of the incident?**
  Is the substation in a rural or remote outside area (perimeter chain link fence), in a populated area (perimeter "fence" limiting view inside), or in the heart of the city (potentially inside a building)?
- **What is the external public impact?**
  Has Xcel Energy addressed the informational needs of the emergency services, the impact on the public and what will be necessary to lessen the public's fear, imposition and loss of power? Xcel Energy's communications team is ready to respond.
- **Are there any other hazards present?**
  Could there be an explosion, structural instability due to earthquake, mechanical equipment or hazardous materials present? In many substations there is combustible oil used to cool the circuit breakers and transformers. This hazard can create large flammable liquid fires outside and inside the substation.
- **Can the incident escalate?**
  What could possibly happen that would make this incident worse and has it been addressed? Can oil in transformers ignite or explode? Will the oil flow through duct openings or travel to lower floors?

SOLAR SAFETY

Fire safety guidelines for rooftop- and ground-mounted solar photovoltaic systems

Solar photovoltaic (PV) systems can present a variety of significant hazards when responding to an emergency. The following information is intended to assist emergency responders in their decision-making process at emergencies involving solar power systems on buildings.

- The PV array will always generate electricity during daylight, even when cloudy, raining, snowing, etc., and the generation of electricity cannot be turned off.
- Consider all PV equipment and wires to be energized, and do not touch or cut into or through PV modules, conduit or equipment.
- Do not open combiner box (square box, usually only on large commercial units). All energized wires from the solar panels are fed into the combiner box, then combined into two large high-current wires. Opening this box is dangerous. Boxes are normally locked.

If solar panels or batteries are on fire:

- Wear SCBA and full protective clothing.
- Locate battery storage area (if applicable).
- Ensure that people downwind of the fire are safe.
- Use CO_2 or dry chemical fire extinguishers to extinguish lead-acid battery fires, or if a PV system shorts and starts a fire. For larger fires some foams* can be effective to extinguish lead-acid battery fires. Be mindful not to stand in run-off water.
- Should the PV array become engulfed in fire, let it burn but protect the surrounding exposure with a wide fog pattern of water at appropriate nozzle pressure.
- Avoid spraying water directly on energized electrical equipment.

***Note:** Some fire-fighting foam is a surfactant mixed with water, which could potentially conduct electricity. It is not advisable to use such foams to put out electrical fires. Be sure to follow the manufacturer's recommendations for using foam to fight fires.

Solar Safety – A-Z Guide

Under normal operating conditions, PV systems are safe to operate. The PV industry has a good safety record. Keep the following hazards in mind when responding to emergencies around PV systems.

Battery emergencies

- Wear full protective clothing and self-contained breathing apparatus (SCBA).
- Extinguish lead-acid battery fires with dry chemical, CO_2 or foam fire extinguishers.
- Do not use water to put out a battery fire.
- Never cut into the batteries under any circumstances.
- If the battery is punctured by a conductive object, assume that the object has electrical potential.

Battery hazards – Some installations may have batteries installed.

- Batteries that are burning or exposed to fire may produce extremely corrosive fumes and gases.
- Electrolyte is corrosive and should be handled appropriately.
- Spilled electrolyte can react and produce toxic fumes.
- Spilled electrolytes that come in contact with other metals and liquids may produce flammable and explosive gases, such as hydrogen.
- Due to the potential of explosive gases, prevent all open flames and avoid creating sparks.

Electrical shock and burns – Contact with electricity can cause a range of effects, from a slight tingling sensation because of involuntary muscle reaction to severe burns, and even death. Burns that may occur in electrical incidents include electrical, arc and thermal. Arc temperatures can reach 15,000 to 35,000 degrees.

Evacuation – If a rooftop-mounted system is involved in a fire, evacuate the building where the rooftop array is located.

Foam or salvage cover – You cannot block the sunlight on the PV array with foam or a salvage cover. Foam will slide off the PV array, and although a salvage cover significantly reduces sunlight to the array, electricity can still be generated through it.

Ground hazards – There may be uneven terrain where ground-mounted arrays are located. Use caution when approaching. Also, be alert to local wildlife habitat in the area and do not cut any electrical conduits.

Inhalation exposure – During a fire or explosion, the PV frame can quickly degrade, exposing hazardous chemicals to direct flame which can then spread in the smoke plume:

- Boron – No health effects to humans or the environment.
- Cadmium Telluride – A known carcinogen. The primary route of exposure is inhalation.
- Gallium Arsenide – The health effects have not been studied. Considered highly toxic and carcinogenic.
- Phosphorus – Fumes from compounds are considered highly toxic. The NIOSH (National Institute for Occupational Safety and Health) recommended exposure limit to phosphorus is 5 mg/m3. A lethal dose of phosphorus is 50 milligrams.

Lock out/Tag out – Make sure you lock out and tag out all electrical disconnects, isolating the PV system at the inverter. Note that new systems have individual micro inverters on each panel or array.

Personal protective equipment – Emergency responders should follow the minimum standard in NFPA (National Fire Protection Association) 1971, Protective Ensemble for Structural Firefighting, and NFPA 1500, Chapter 7, Personal Protective Equipment.

Removal and cleanup – Damaged PV system removals are performed under the direction of the owner, by qualified and trained individuals. Owners of PV systems are prepared to have damaged panels removed and recycled. In the event damaged PV panels must be moved, emergency responders should use full turnout gear, due to the potential presence of hazardous chemicals and decomposition products. Some of these chemicals/products can be corrosive to the skin and dangerous if inhaled. Do not pull the electric meter to shut off power to a building.

Roof hazards – Consider the weight of the PV array on a weakening roof structure and the fact that you may not be able to access the roof over the fire:

- Do not cut into PV modules
- Do not cut any electrical conduits
- Consider cross-ventilation
- Be aware of tripping hazards to prevent falls

Shelter in place – Does the size of the emergency and the involvement of the array in fire constitute the need to protect populations downwind?

Ventilation – Consider where to cut or whether to use cross-ventilation.

Other safety considerations:

- Size up the rooftop- or ground-mounted system and look for warning labels on electrical disconnects.
- Walking on or breaking PV modules could release all the energy in the system simultaneously.
- Cut or damaged wires from a nighttime operation could become energized in the daytime.
- Hand lights used during an evening operation are not bright enough for the PV system to generate electricity, but scene lighting may.
- Please do not remove the electric meter to shut off power to a building.
- Lightning is bright enough to create an electrical surge.
- When working near electrical circuits, keep in mind that current detection instruments on many engines can only detect alternating current, and would not detect direct current in PV wiring or battery conductors.

For more information visit:

https://xcel-energy.rtueonline.com/

http://www.nfpa.org/ (Keyword: Solar)

Prepare – Xcel Energy mitigates wildfire risks and incorporates wildfire concerns into Incident Response Plans.

Respond – 24-7 monitoring occurs for each operational area. Each operational area activates the appropriate level of response, which at times includes all operational areas.

Recover – Incident Response Plans include damage assessment and recovery planning, ensuring customers' power is restored.

WILDFIRE RESPONSE

Xcel Energy continues to improve all-hazard Incident Response Plans to include wildfire concerns. Integrated wildfire monitoring, threat assessment, and communications protocols in Xcel Energy's Incident Response Plans streamlines and strengthens our ability to respond to wildfire events.

Stakeholder engagement

An important component of wildfire response is developing partnerships and sharing information with local, state and federal agencies, emergency managers, dispatch agencies, and incident management teams, as well as community groups involved in wildfire planning. Pre-event engagement helps all stakeholders understand critical needs, reliance, and command structures. Xcel Energy's operations and emergency preparedness teams continually work with our stakeholder to ensure response plans are coordinated as a "one team" approach.

Want to know more about Incident Response Plans or conducting drills? Contact us at: **dlEnterpriseResilience@xcelenergy.com**.

For information on our mitigation efforts, visit our website, **XcelEnergyWildfireProtection.com** or contact us at **info@XcelEnergyWildfireProtection.com**.

CONTACTS AND RESOURCES

Safety is our highest priority. To ensure the safety of the community, we have provided unpublished, dedicated 800-numbers to emergency communications centers in communities we serve. Our 800-numbers enable communications center personnel to directly and quickly contact us when they receive information about an emergency that involves our facilities. Business cards containing these confidential emergency phone numbers are available to emergency responder organizations from your Xcel Energy community representative.

Your communication dispatch center often is the first step in connecting us to an energy emergency. We ask that 911 dispatchers transfer calls like these to our Customer Service line at **800-895-4999**.

Which line should you call?

First responders receive top priority at Xcel Energy. The business cards provided by your community representative contain separate response lines for both life-threatening and non life-threatening emergencies. Here are the details for determining which number you should call:

Use the response lines for life-threatening situations when:

- Immediate action is required by Xcel Energy personnel.
- Emergency responders are on-scene.

Please have the following information available:

- Complete or closest address, GPS coordinates, if known, or best directions possible, including nearest cross streets.
- Exact nature of the situation.

Use the response line for non life-threatening situations or essential services outages when:

- Critical customers or essential public services are affected by outages, such as sewage pumping stations, water wells, essential municipal buildings and urgent care facilities (e.g., hospitals).

Please have the following information available:

- Address of the building affected by the outage.
- The building's Xcel Energy premises or account number. (This information will help us know what equipment may be affected.)

Xcel Energy®

FOR EMERGENCY AGENCY USE ONLY.
These numbers are not intended for the general public.

Emergency Response Personnel Lines

For Life-Threatening Emergencies ONLY:
- **Gas** Emergency Response Personnel Line ..... **XXX-XXX-XXXX**

For Non Life-Threatening Emergencies and Essential Services Outages ONLY:
- **Electric** Outages Response Line..... **XXX-XXX-XXXX**

Important

- **Do not release emergency response phone numbers to the public.**
- **Ensure that 911 dispatchers do not transfer calls to our emergency response line.**

Point your cellphone camera at the QR code to visit the Public Safety pages on xcelenergy.com.

NOTE: Xcel Energy may not be the electric or natural gas service provider in your area. Be sure to contact the correct local energy service provider in case of emergency.

When customers should call Xcel Energy directly

Customers should call Xcel Energy directly for the best service when:

- There are outages not associated with emergencies.
- There is a blown fuse or other loud noise.
- There are wires down and emergency response personnel are not on the scene.

In situations where your agency would not generally respond, please advise the customer to call us at the numbers listed below.

General public numbers and website

Xcel Energy Electric Outage: **800-895-1999**

Xcel Energy Residential Customer Service: **800-895-4999**

Xcel Energy Business Solutions Center: **800-481-4700**

TDD/TYY (hearing-impaired service): **800-895-4949**

Xcel Energy Website: **xcelenergy.com**

About response times

While emergency responders are often the first on the scene, our prompt response to emergency calls helps ensure the safety of those nearby. When the situation requires immediate action from our first responders, local emergency dispatch communications centers help us by providing accurate information when they initially contact us, such as:

- A complete address, the nearest one available or the best directions possible, including nearest cross streets, to the location of the emergency.
- An accurate description of the energy situation and specifics regarding what the responder anticipates Xcel Energy can do to make the situation safe, such as de-energizing a line, stopping blowing gas, etc.

During extreme conditions (most often storm-related) that cause extensive electrical outages, all available trained Xcel Energy employees perform some level of field inspections. Generally, our response time during such extreme conditions averages approximately four hours; however, it could be up to eight hours or more before an Xcel Energy inspector arrives on the scene.

Unified command at utility emergencies

In large incidents, it is common to use a modified incident command structure, called unified command, whereby representatives from both the emergency services command and utility companies work together. They share information and coordinate personnel to develop an overall action plan that best solves the problem. The unified command team develops an incident action plan that uses agreed-upon strategies and tactics to accomplish the mission.

In high voltage emergencies involving an electric substation or a generation plant, the unified command process is the only way to guarantee success and assure the safety of all responders and utility personnel at the scene. Unified command at utility emergencies provides a joint method for incident management teams to:

- Determine incident priorities and identify strategic goals
- Select tactics for achieving the strategic incident goals and priorities
- Ensure joint planning for objectives and tactical activities
- Allow joint tactical operations to be conducted
- Maximize the use of all assigned resources
- Provide a method for resolving conflicts among the team players

Responding to Utility Emergencies (RTUE) online

As an emergency responder you do everything possible to keep your community safe. But if the situation involves electricity or natural gas, do you know how to keep the public and your team safe? Utility emergencies present unique dangers to recognize and handle. Knowing about them and specific actions to take can lead to better results and, ultimately, to saved lives.

Responding to Utility Emergencies (RTUE) online (**https://Xcel-Energy.RTUEonline.com**) can effectively bridge the knowledge gap. It complements your department's training program, and gives you new information. It also provides a refresher about working safely during a utility emergency.

RTUE online offers access to effective interactive training based on national standards. It includes learning objectives and application activities to educate and engage all types of responders, including firefighters, police officers and other emergency personnel. Training can be tracked and a certificate will be offered upon completion of the course.

Electric and Magnetic Fields Supplement

There is concern about the potential for adverse health effects from exposure to electric and magnetic Fields (EMF) as the result of residing near high voltage transmission lines (HVTLs). Extremely low-frequency (ELF) - EMF that is emitted from HVTLs does not have the energy to ionize molecules or to heat them; however, they are fields of energy and thus have the potential to produce effects.

In the 1970s, epidemiological studies indicated a possible association between childhood leukemia and EMF levels. Since then, various types of research, including animal studies, epidemiological studies, clinical studies and cellular studies, have been conducted to examine the potential health effects of EMF. Scientific panels and commissions have reviewed and studied this research data. These studies have been conducted by, among others, the National Institute of Environmental Health Sciences (NIEHS), the World Health Organization (WHO), the International Agency for Research on Cancer (IARC), the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) and the Minnesota State Interagency Working Group (MSIWG). In general, these studies concur that:

- Based on epidemiological studies, there is a weak association between childhood leukemia and EMF exposure. There is however no consistent association between EMF exposure and other diseases in children or adults.

- Laboratory, animal, and cellular studies fail to show a cause and effect relationship between disease and EMF exposure at common EMF levels. A biological mechanism for how EMFs might cause disease has not been established.

Because a cause and effect relationship cannot be established, yet a weak association between childhood leukemia and EMF exposure has been shown: 1) the potential health effects of EMF are uncertain; 2) no methodology for estimating health effects based on EMF exposure exists; 3) further study of the potential health effects of EMF is needed; and 4) a precautionary approach, including regulations and guidelines, is needed in designing and using all electrical devices.

Researchers continue to study potential health effects related to ELF-EMF and potential causal mechanisms. The following sections provide brief summaries from scientific panels and commissions that have examined the potential health impacts of ELF-EMF.

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID program). Congress instructed NIEHS and the U.S. Department of Energy to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risk from exposure to ELF-EMF. The program provided the following conclusions to Congress (NIEHS 1999, reference 1):

- “The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak.

- Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent positive findings in animal or mechanistic studies weakens the belief that this

association (the epidemiological association between ELF-EMF and childhood leukemia) is actually due to ELF-EMFs but it cannot completely discount the epidemiological findings.

- The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on education both the public and regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer outcomes provide sufficient evidence of a risk to currently warrant concern."

In 2002, the EMF-RAPID program published a detailed question and answer pamphlet summarizing research on ELF-EMF and potential health effects. The pamphlet is available at: http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

World Health Organization

In 1996, the WHO established the International EMF Project to study the potential health impacts of EMF. The project develops and disseminates information on EMF and public health. In 2007, the WHO issued an environmental health monograph on ELF-EMF (WHO 2007, reference 2). The monograph concluded:

- "Scientific evidence suggesting that everyday, chronic low-intensity (above 0.3 – 0.4 μT) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. Uncertainties in the hazard assessment include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern.

- A number of other diseases have been investigated for the possible association with ELF magnetic field exposures. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.

- The use of precautionary approaches is warranted. However, electric power brings obvious health, social and economic benefits and precautionary approaches should not compromise these benefits. Furthermore, given both weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia and the limited impacted on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. The costs of implementing exposure reductions would vary from one country to another, making it very difficult to provide general recommendation for balancing the costs against the potential risk from ELF fields."

International Agency for Research on Cancer

Since 1969, the IARC has been evaluating the carcinogenic risks of chemicals and other agents, such as viruses and radiation. In 2001, the IARC convened a working group of scientists to evaluate possible carcinogenic risks to humans from exposure to EMF (IARC 2002, reference 3). These scientists concluded that ELF magnetic fields are possibly carcinogenic to humans (a "Group 2B carcinogen"). Group 2B carcinogens are agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals. The working group concluded:

- "Since the first report suggesting an association between residential ELF electric and magnetic fields and childhood leukemia was published in 1979, dozens of increasingly sophisticated studies have examined this association. In addition, there have been numerous comprehensive review, meta-analyses and two recent pooled analyses. In one pooled analysis…no excess risk was seen for exposure to ELF magnetic fields below 0.4 μT and a twofold excess risk was seen for exposure above 0.4 μT. [In the other study] a relative risk of 1.7 for exposure above 0.3 μT was reported.

- No consistent relationship has been seen in studies of childhood brain tumors or cancers at other sites and residential ELF electric and magnetic fields.

- While a number of studies are available, reliable data on adult cancer and residential exposure to ELF electric and magnetic fields, including the use of appliances, are sparse and methodologically limited…. Although there have been considerable number of reports, a consistent association between residential exposure and adult leukemia and brain cancer has not been established."

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)

The SCENIHR serves as an advisory committee to the European Commission. At the request of the Commission, the SCENIHR reviewed possible adverse health impacts due to EMF. In 2007, the committee concluded (SCENIHR 2007, reference 4):

- "The previous conclusion (by a prior advisory committee, the Scientific Committee on Toxicity, Ecotoxicity and the Environment, CSTEE) that ELF magnetic fields are possibly carcinogenic, chiefly based on occurrence of childhood leukemia, is still valid. For breast cancer and cardiovascular disease, recent research has indicated that an association is unlikely. For neurodegenerative diseases and brain tumors, the link to ELF fields remains uncertain."

- In vitro studies have documented that that low intensity ELF can inhibit the anti-proliferative effect of tamoxifen on a specific subclone of human MCF-7 breast cancer cells (Blackman et al. 2001, reference 5; Ishido et al. 2001, reference 6; Girgert et al. 2005, reference 7). There is a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

In 2009, the committee updated its prior opinion after reviewing new studies of ELF-EMF (SCENIHR 2009, reference 8) and concluded:

- "The new information available is not sufficient to changes the conclusions of the 2007 opinion. The few new epidemiological and animal studies that have addressed ELF exposure and cancer do not change the previous assessment that ELF magnetic fields are a possible carcinogen and might contribute to an increase in childhood leukemia. At present, in vitro studies did not provide a mechanistic explanation of this epidemiological finding.

- New epidemiological studies indicate a possible increase in Alzheimer's disease arising from exposure to ELF. Further epidemiological and laboratory investigations of this observation are needed."

- There remains a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

Minnesota State Interagency Working Group (MSIWG)

In 2002, the MSIWG on EMF issues was formed to examine the potential health impacts of EMF and to provide science-based information to policy makers in Minnesota. Working group members included representatives from the Department of Commerce, Department of Health, Pollution Control Agency, Public Utilities Commission, and Environmental Quality Board. The working group issued a white paper entitled "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options" (MSIWG on EMF Issues 2002, reference 9). The white paper concluded:

- "Some epidemiological results do show a weak but consistent association between childhood leukemia and increasing exposure to EMF... However, epidemiological studies alone are considered insufficient for concluding that a cause and effect relationship exists and the association must be supported by data from laboratory studies. Existing laboratory studies have not substantiated this relationship… nor have scientists been able to understand the biological mechanism of how EMF could cause adverse effects. In addition, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMF.

- The Minnesota Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk from EMF cannot be dismissed. Construction of new generation and transmission facilities to meet increasing electrical needs in the state is likely to increase exposure to EMF and public concern regarding potential adverse health effects.

- Based on its review, the Work Group believes the most appropriate public health policy is to take a prudent avoidance approach to regulating EMF. Based upon this approach, policy recommendations of the Work Group include:

    - Apply low-cost EMF mitigation options in electric infrastructure construction projects;

    - Encourage conservation;

    - Encourage distributed generation;

    - Continue to monitor EMF research;

- Encourage utilities to work with customers on household EMF issues; and
- Provide public education on EMF issues."

Health Concern Article Review

During the comment period for the draft environmental impact statement, commenters requested additional information regarding potential impacts to vulnerable populations and brought forth additional studies not previously reflected in this supplement. This section summarizes the findings of those studies. EERA staff was unable to locate peer-reviewed sources that specifically address potential impacts of EMF to fetuses, geriatric people , and those with acute or chronic illnesses.

A study conducted at an infertility clinic in Iran from 2014-2016 found that "After adjusting for confounding factors, women living within 500 meters of the lines carried a higher risk…of infertility compared with women living more than 1000 meters of the lines." However, tThis paper goes on to acknowledges that its results "may be partly subjective in nature, as [the authors] did not directly measure the electromagnetic field strength in residential areas . . . the findings were mainly based on the distance from a power line." The authors point out that using GIS data is nonetheless valuable. "Furthermore, the cross-sectional nature of the study design did not permit assessment of the temporal and thus potentially causal relation of the exposure and infertility". (Esmailzedeh et al, 2019, reference 10).

Regarding the effect of EMF on fetus development, a systematic review of EMF studies on non-human mammals found that RF-EMF exposure in utero "probably does not affect offspring brain weight and may not decrease female offspring fertility; on the other hand, RF-EMF may have a detrimental impact on neurobehavioural functions, varying in magnitude for different endpoints, but these last findings are very uncertain" (Cordelli et al. 2023, reference 16). An additional meta-analysis and systematic review looked at studies with human subjects, and found that that ELF-EMF and RF exposure during pregnancy was associated with several fetal complications, including "significant enhancement of oxidant factors, decrease of antioxidant factors, and increase in DNA damage parameters, as well as changes in expression proteins in cord blood genes..." There is also an association of "close maternal exposure in prenatal and postnatal (residence or occupational exposure) with EMFs of high voltages power lines more than 1 mG or 50 Hz with congenital anomalies (CNS defect, spina bifida) and fetal developmental disorders (such as reduced embryonic bud length) and neurodevelopmental disorders in childhood (e.g., speech problems in children)." However, the review concludes "due to the limitations of studies, such as inaccurate measurement of exposure to ELF-EMF...or inaccurate measure of the actual rate of exposure to EMF or case–control model of most studies, the effects of EMF on fetal and childhood abnormalities should be interpreted with caution" (Kashani et al, 2023, reference 17"The role of electromagnetic fields in neurological disorders" published in the Journal of Chemical Neuroanatomy, found that: "There is some evidence that EMFs can affect brain activity and the sleep cycle in humans. However, the health correlation is not clearly defined and studies cannot explain the precise mechanisms." It concluded that further studies of these effects are needed" (Terzi et al, (2016), reference 15).

There are multiple studies that suggest the potential for negative effects of EMF on health, including concerns about various cognitive functions (Kazemi et al 2018; Tekieh et al 2018; Aliyari et al 2019; Duan et al 2014, Aliyari et al 2022), melatonin levels (Kazemi et al 2018, Aliyari et al 2022)), psychological effects including stress levels (Aliyari et al 2019, Aliyari et al 2022); cellular health (Garip and Akan 2010); metabolic health including changes in blood composition (Aliyari et al 2022); and neurochemical levels and neuronal health (Duan et al 2014). These studies relied on small sample sizes, short durations of

observation, in-vitro or controlled conditions with consistent exposure levels that would not necessarily reflect actual exposure levels, and/or single species observations not on humans and the findings are therefore limited and further research is required.

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Draft Agricultural Impact Mitigation Plan

Minnesota Energy Connection Project
Route Permit Application
MPUC Docket No. E002/TL-22-132
October 2023

DRAFT AGRICULTURAL IMPACT MITIGATION PLAN
MINNESOTA ENERGY CONNECTION PROJECT

MPUC Docket Nos. E002 /CN-22-131
& E002/TL-22-132

October 2023

Northern States Power Company

414 Nicollet Mall
Minneapolis, MN 55401

1 INTRODUCTION

Northern States Power Company, doing business as Xcel Energy (Xcel Energy or the Company) developed this Agricultural Impact Mitigation Plan (AIMP) with the Minnesota Department of Agriculture (MNDOA). The Company is seeking a Certificate of Need and Route Permit from the Minnesota Public Utilities Commission to construct the Minnesota Energy Connection Project between Sherburne and Lyon Counties, Minnesota (Project). The AIMP identifies measures Xcel Energy will take during construction to avoid, mitigate, minimize, repair, or provide compensation for impacts on Agricultural Land. The AIMP and its provisions will be implemented during construction and restoration activities that Xcel Energy undertakes for the Project prior to filing notice of completion of construction with the Minnesota Public Utilities Commission.

Capitalized words and other defined terms have the meanings given to them in this AIMP and its appendix. Use of "Landowner" in this AIMP may be construed to read "Landowner and/or Tenant."

This AIMP and its construction standards and policies apply only to construction activities occurring on privately owned Agricultural Land. If agricultural tile is encountered, whether on Non-Agricultural Land or Agricultural Land, Xcel Energy will implement construction standards relating to the repair of tile on Agricultural Lands discussed further in this AIMP. Portions of this AIMP that identify standards and policies as they apply to Organic Agricultural Land apply only to the types of lands defined in the National Organic Program Rules (7 C.F.R. Parts 205.100; 205.101, and 205.202). Further, construction standards and policies identified in this AIMP can be modified through Easement or other agreement between the Company and the Landowner of Agricultural Land, as appropriate. In such case, the Easement or other agreement will control.

2 GENERALLY

The mitigative actions set forth in this AIMP are subject to negotiation and approval or change by the Landowner of Agricultural Land, so long as such changes are negotiated with and acceptable to Xcel Energy. Mitigative actions will be executed by Xcel Energy employees or by qualified contractors retained by Xcel Energy, unless otherwise specified or agreed upon by the Landowner. Xcel Energy and the Landowner may agree that certain activities will be performed by the Landowner.

Unless otherwise specified in this AIMP or in an Easement or other agreement negotiated between the Company and the Landowner, construction standards and policies or mitigative actions will be implemented within 90 days after completion of

Final Clean-up activities on Agricultural Land. Weather conditions, or other circumstances identified by mutual agreement between the Landowner and Xcel Energy, may delay implementation of mitigative actions after final clean-up. Where Xcel Energy determines it is practicable, Xcel Energy may make temporary repairs to minimize impacts or interference with the Landowner's access to the subject Agricultural Land or to comply with Federal or State permits and regulations.

Xcel Energy or its contractors will implement the construction standards and policies or mitigative actions identified within this AIMP so long as such activities do not conflict with any applicable Federal or State rules, regulations, permits, licenses, approvals, or conditions obtained by the Company for the Project. Should any activity within this AIMP be determined to be unenforceable or prohibited due to Federal or State rules, regulations, permits, licenses, approvals, or conditions, Xcel Energy will inform the Landowner and will identify a reasonable alternative activity.

Prior to Right-of-Way preparation or construction, Xcel Energy will make a good faith effort to provide each Landowner with contact information, including a phone number and address that can be used to contact Xcel Energy regarding any impacts to Agricultural Land or other construction-related concern or question. Xcel Energy will provide updated information to the Landowner within a reasonable time of any change to Xcel Energy's contacts.

2.1 CONSTRUCTION STANDARDS

2.1.1 Mitigative Actions

Xcel Energy will reasonably restore and/or compensate the Landowner, as appropriate, for damages caused by Xcel Energy as a result of transmission line construction, and as outlined in this AIMP. Xcel Energy will decide whether to restore land and/or compensate the Landowner after a discussion with the Landowner.

2.1.2 Advance Notice of Access

Xcel Energy will make good faith efforts to provide notice to the Landowner in advance of the commencement of initial construction activities on Agricultural Land. Notice may include personal contact, email, letter, or telephone contact.

2.1.3 Environmental / Agricultural Inspector

Xcel Energy will hire an Environmental/Agricultural Inspector to monitor compliance with this AIMP and other permit conditions/regulatory requirements.

The Environmental/Agricultural Inspector will audit the Company's compliance with this AIMP. If the Environmental /Agriculture Inspector observes a significant non-

compliant activity it will be reported to Xcel Energy immediately. The MDA may also instruct the Environmental/Agriculture Inspector to report non-compliant activities to the MDA. If after reviewing the non-compliant activity and if judgement is made that continuing the activity will cause damage to the environment or agricultural land, Xcel Energy would issue a stop work order.

2.1.4 Pole Placement

During the design of the Project, Xcel Energy's engineering, real estate, and permitting staff will seek input from the Landowner, as practicable, to address pole placement issues. Prior to construction, the land rights agents will review the planned pole locations with the Landowner when requested to do so by the Landowner.

2.1.5 Agricultural Tile

Xcel Energy will contact an affected Landowner for his/her knowledge of tile locations prior to installation of the transmission line. Xcel Energy will attempt to identify tile if the Landowner does not know if tile is located at the proposed pole location(s). Tile that is damaged, cut, or removed as a result of Xcel Energy's location efforts will be promptly repaired.

If tile is damaged by Project construction, the tile will be repaired with materials of the same quality as that which was damaged. If tiles on or adjacent to the transmission line construction area are adversely affected by construction, Xcel Energy will take such actions as are necessary to restore the tile function, including the relocation, reconfiguration, and replacement of the existing tile. Xcel Energy will correct tile repairs, as needed, after completion of the transmission line construction, provided the repairs were made by Xcel Energy or their agents or designees.

The affected Landowner may elect to negotiate a fair settlement with Xcel Energy for the Landowner to undertake the responsibility for repair, relocation, reconfiguration, or replacement of damaged tile. In the event the Landowner chooses to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged tile, Xcel Energy will have no further liability for the identified damaged tile.

The following standards and policies apply to the tile repairs completed by Xcel Energy, unless otherwise agreed to by the Landowner and Xcel Energy:

1. Tiles will be repaired with materials of the same or better quality as that which was damaged.
2. If water is flowing through a damaged tile, temporary repairs will be promptly installed and maintained until such time that permanent repairs can be made.

3. Xcel Energy will make efforts to complete permanent tile repairs within a reasonable timeframe after Final Clean-up, taking into account weather and soil conditions.
4. Following completion of the Final Clean-up and damage settlement, Xcel Energy will be responsible for correcting and repairing tile breaks, or other damages to tile systems that are discovered on the Right-of-Way to the extent that such breaks are the result of Project construction. These damages are usually discovered after the first significant rain event. Xcel Energy will provide the Landowner with contact information should tile damage issues be identified after Final Clean-up. The Company will not be responsible for tile repairs performed by the Landowner.

Xcel Energy will be responsible for repairing areas as necessary to properly drain wet areas along the Right-of-Way caused by the construction of the Project.

2.1.6 Soil Compaction/Rutting

Xcel Energy will repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by Project construction. If, by mutual agreement, the Landowner repairs such damage, Xcel Energy will reimburse the Landowner for the reasonable cost of labor and the use of equipment to repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by transmission line construction. Xcel Energy will make such payments within a reasonable period of time following completion of project construction and after receiving a statement substantiating the Landowner's repair costs.

If there is a dispute between the Landowner and Xcel Energy as to what areas need to be ripped or chiseled, the depth at which compacted areas should be ripped or chiseled, or the necessity for, or rates of, lime, fertilizer, and organic material application, Xcel Energy will consult with the Environmental/Agricultural Inspector prior to making a final decision.

2.1.7 Excess Soil and Rocks

Excess soil and rock will be removed from the site unless otherwise requested by the Landowner. After Final Clean-up and restoration of Agricultural Lands, Xcel Energy will make good faith efforts to obtain written acknowledgement of completion of such activities from the Landowner.

2.1.8 Construction Debris

Xcel Energy will promptly remove construction-related debris and material which is not an integral part of the transmission line from the Landowner's property at the Company's cost. Such material may include excess construction materials or litter generated by the construction crews. Xcel Energy, on behalf of the Company, will pay for the reasonable cost of repairs to the Landowner's equipment if the equipment is damaged by materials or debris Xcel Energy left on the property during construction.

2.1.9 Procedures for Determination of Damages and Compensation

Xcel Energy will maintain a procedure for processing Landowner claims for construction-related damages, including but not limited to crop damages. The procedure is intended to standardize and minimize Landowner concerns regarding the recovery of damages, to provide a degree of certainty and predictability for the Landowner and the Company, and to foster good relationships among the Company and Landowner over the long term. A copy of the procedure will be provided to the Landowner during Easement acquisition negotiations.

Damage claim negotiations between Xcel Energy and any affected Landowner will be voluntary in nature. Xcel Energy will offer to compensate Landowners according to the terms of Xcel Energy's damage claim policy in effect at the time the Easement is executed and recorded. The compensation offered is only an offer to settle, and the offer shall not be introduced in any proceeding brought by the Landowner to establish the amount of damages Xcel Energy must pay on behalf of the Company.

2.1.10 Soil Conservation Practices

Soil conservation practices such as terraces and grassed waterways which are damaged by the transmission line's construction will be restored to their pre-construction condition as near as possible. Xcel Energy will attempt to work with the Landowner to identify and document the pre-construction conditions of these features.

2.1.11 Irrigation

If the transmission line and/or temporary work areas intersect an operational (or soon to be operational) spray irrigation system, Xcel Energy will work with the Landowner to establish an acceptable amount of time the irrigation system may be out of service.

If, as a result of the transmission line construction activities, an irrigation system interruption results in crop damages either on the Right-of-Way or off the Right-of-Way, the Landowner will be compensated for resulting crop loss.

If it is feasible and mutually acceptable to Xcel Energy and the Landowner, temporary measures will be implemented to allow an irrigation system to continue to operate across land on which the transmission line is also being constructed. Xcel Energy will not allow an irrigation system to continue operation across land on which the transmission line is also being constructed if Xcel Energy determines that such operation would be unsafe.

2.1.12 Access Routes/ Temporary Roads

The location of access routes to be used for construction purposes will be discussed with the Landowner.

A. The access routes will be designed to not impede proper drainage and will be built to mitigate soil erosion on or near the temporary roads.

B. If grading is required to create a temporary road, these temporary roads may be left intact through mutual agreement of the Landowner and Xcel Energy unless otherwise restricted by Federal, State, or local regulations.

C. If a temporary road is to be removed, the Agricultural Land upon which the temporary road is constructed will be returned to its previous use and restored to equivalent condition as existed prior to construction.

2.2 ORGANIC FARMS

This section identifies mitigation measures that apply specifically to farms that are Organic Certified or farms that are in active transition to become Organic Certified and is intended to address the unique management and certification requirements of these operations. This section supplements and is in addition to all other protections provided in this AIMP.

The provisions of this section will only apply to Organic Agricultural Land for which the Landowner has provided to Xcel Energy a true, correct and current version of the Organic System Plan within 60 days after the signing of the Easement or 60 days after the first contact by Xcel Energy after the Commission issues a Route Permit, whichever occurs first.

2.2.1 Organic System Plan

The Company recognizes the importance of the individualized Organic System Plan to the Organic Certification process. Xcel Energy will work with the Landowner, the Landowner's Certifying Agent, and/or a mutually acceptable third-party organic consultant to identify site-specific construction practices that will minimize the potential for Decertification as a result of construction activities. Possible practices

may include, but are not limited to: equipment cleaning, planting a deep-rooted cover crop in lieu of mechanical decompaction, applications of composted manure or rock phosphate, preventing the introduction of disease vectors from tobacco use, restoration and replacement of beneficial bird and insect habitat, maintenance of organic buffer zones, use of organic seeds for any cover crop, or similar measures. The Company recognizes that Organic System Plans are proprietary in nature and will respect the need for confidentiality.

2.2.2 Prohibited Substances

Xcel Energy will avoid the application of Prohibited Substances onto Organic Agricultural Land. No herbicides, pesticides, fertilizers or seed will be applied to Organic Agricultural Land unless requested and approved by the Landowner. Likewise, Xcel Energy will avoid refueling, fuel or lubricant storage, or routine equipment maintenance on Organic Agricultural Land. Equipment will be checked prior to entry to make sure that fuel, hydraulic and lubrication systems are in good working order before working on Organic Agricultural Land. If Prohibited Substances are used on land adjacent to Organic Agricultural Land, these substances will be used in such a way as to prevent them from entering Organic Agricultural Land.

2.2.3 Temporary Road Impacts

Topsoil and Subsoil layers that are removed during construction on Organic Agricultural Land for temporary road impacts will be stored separately and replaced in the proper sequence after the transmission line is installed. Unless otherwise specified in the site-specific plan described above, Xcel Energy will not use this soil for other purposes, including creating access ramps at road crossings. No Topsoil or Subsoil (other than incidental amounts) may be removed from Organic Agricultural Land. Likewise, Organic Agricultural Land will not be used for storage of soil from non-Organic Agricultural Land.

2.2.4 Erosion Control

On Organic Agricultural Land, Xcel Energy will, to the extent feasible, implement erosion control methods consistent with the Landowner's Organic System Plan. On land adjacent to Organic Agricultural Land, Xcel Energy's erosion control procedures will be designed so that sediment from adjacent non-Organic Agricultural Land will not flow along the Right-of-Way and be deposited on Organic Agricultural Land. Treated lumber, non-organic hay bales, non-approved metal fence posts, etc. will not be used for erosion control on Organic Agricultural Land.

2.2.5 Weed Control

On Organic Agricultural Land, if Xcel Energy determines weed control is necessary during construction activities, Xcel Energy will, to the extent feasible, implement weed control methods consistent with the Landowner's Organic System Plan. Prohibited Substances will not be used for weed control within 50 feet of posted Organic Agricultural Land.

2.2.6 Monitoring

In addition to the responsibilities of the Environmental/Agricultural Inspector described in the AIMP, the following will apply:

A. The Environmental/Agricultural Inspector will monitor construction and restoration activities on Organic Agricultural Land for compliance with the provisions of this section and will document any activities that may result in Decertification.

B. Instances of non-compliance will be documented according to Independent Organic Inspectors Association protocol consistent with the Landowner's Organic System Plan, and will be made available to the MDA, the Landowner, the Landowner's Certifying Agent, and to the Company.

2.2.7 Compensation for Construction Damages

The settlement of damages will be based on crop yield and/or crop quality determination and the need for additional restoration measures. Xcel Energy will first work with the Landowner of Organic Agricultural Land to determine crop yield. In the event Xcel Energy and the Landowner of Organic Agricultural Land cannot determine crop yield, at Xcel Energy's expense, a mutually agreed upon professional agronomist will make crop yield determinations, and the MDA Fruit and Vegetable Inspection Unit will make crop quality determinations. If the crop yield and/or crop quality determinations indicate the need for soil testing, the testing will be conducted by a commercial laboratory that is properly certified to conduct the necessary tests and is mutually agreeable to Xcel Energy and the Landowner. Field work for soil testing will be conducted by a professional soil scientist or professional engineer licensed by the State of Minnesota. Xcel Energy will be responsible for the cost of sampling, testing and additional restoration activities, if needed. Additional restoration activities will be completed according to the terms of its damage claim policy in effect at the time the Easement is executed and recorded.

2.2.8 Compensation for Damages Due to Decertification

Should any portion of Organic Agricultural Land be Decertified as a result of construction activities, Xcel Energy will pay damages for crops and/or livestock within the area impacted by the lost Certification equal to the full difference between the market value of conventional crops and/or livestock and the market value of the organic crops and/or livestock lost for three years or the period of time necessary for the Landowner or Tenant to regain Certification, whichever comes first. The market value of the crop will be determined as set forth in the damage claim policy. At the request of Xcel Energy, the Landowner shall provide verification of its loss of Organic Certification through the accredited certifying agent prior to any compensation for organic crop loss being paid.

2.3 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hay land, or pasture, and land in government set-aside programs.
Environmental / Agricultural Inspector	Inspector retained by the Company responsible for overall project compliance with permit conditions and commitments made in this document.
Certifying Agent	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Cropland	Land actively managed for growing row crops, small grains, or hay.
Decertified or Decertification	Loss of Organic Certification.
Easement	The agreement(s) and/or interest in privately owned Agricultural Land held by the Company by virtue of which it has the right to construct, operate, and maintain the transmission line and associated facilities together with such other rights and obligations as may be set forth in such agreement.
Final Clean-up	Transmission line activity that occurs after the power line has been constructed. Final Clean-up activities may include removal of construction debris, de-compaction of soil as required, removal of temporary erosion control structures, final grading, and restoration of fences and required reseeding. Once Final Clean-up is finished, Landowner will be contacted to settle all damage issues and will be provided a form to sign acknowledging final construction settlement.
The Company	Northern States Power Company, doing business as Xcel Energy. May also include agents and contractors of Northern States Power Company, doing business as Xcel Energy, where appropriate.
Landowner	Person(s), or their representatives, holding legal title to Agricultural Land on the transmission line route from whom the Company is seeking, or has obtained, a temporary or permanent Easement. "Landowner" includes Tenant, if any.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.

Organic Agricultural Land	Farms or portions thereof described in 7 CFR Parts 205.100, 205.202, and 205.101.
Organic Buffer Zone	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Organic Certification or Organic Certified	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.100 and 7 CFR Part 205.101.
Organic System Plan	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Prohibited Substance	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.600 through 7 CFR 205.605 using the criteria provided in 7 USC 6517 and 7 USC 6518.
Right-of-Way	The Land included in permanent and temporary Easements which the Company acquires for the purpose of constructing, operating and maintaining the transmission line and associated facilities.
Subsoil	Soil that is not Topsoil and located immediately below Topsoil.
Tenant	Any Person(s) lawfully renting or sharing land for agricultural production which makes up the "Right-of-Way" as defined in this AIMP.
Tile	Artificial subsurface drainage system.
Topsoil	The uppermost horizon (layer) of the soil, typically with the darkest color and highest content of organic matter.

Minnesota Energy Connection Project
GHG Calculations

Table 1. Summary of Construction GHG Emissions

Regional Segment or Refinement	Association to Applicant Proposed Routes	Fuel Combustion CO_2e[1] (metric tons)	Land Use Change CO_2e[1] (metric tons)	Total CO_2e[1] (metric tons)
Regional Segment A1	applicant proposed Purple Route	2,434.25	34.58	2,468.83
Regional Segment A2	Purple variation	2,448.16	34.56	2,482.72
Regional Segment A3	applicant proposed Blue Route	2,030.86	79.31	2,110.17
Regional Segment A4	Blue variation 2	2,517.71	86.80	2,604.51
Regional Segment A5	Blue variation	2,100.41	46.74	2,147.15
Regional Segment A6	Blue variation	2,016.95	56.85	2,073.80
Regional Segment A7	Blue variation	2,030.86	54.99	2,085.85
Regional Segment B1	applicant proposed Purple Route	6,315.14	131.27	6,446.41
Regional Segment B2	Blue to purple variation 2	7,094.10	125.31	7,219.41
Regional Segment B3	Purple variation	6,523.79	122.51	6,646.30
Regional Segment B4	applicant proposed Blue Route	10,474.23	247.14	10,721.36
Regional Segment C1	applicant proposed Purple Route	7,789.60	132.34	7,921.94
Regional Segment C2	Purple to blue variation 2	8,137.35	130.87	8,268.21
Regional Segment C3	Purple to blue variation 3	8,053.89	153.81	8,207.69
Regional Segment C4	applicant proposed Blue Route	3,978.26	65.99	4,044.25
Regional Segment D1	applicant proposed Purple Route	1,265.81	30.03	1,295.84
Regional Segment D2	Purple variation	1,279.72	29.57	1,309.29
Regional Segment D3	Purple to blue variation	1,404.91	24.46	1,429.37
Regional Segment D4	applicant proposed Blue Route	1,502.28	25.39	1,527.67
Regional Segment D5	Blue variation 2	1,516.19	34.25	1,550.44
Regional Segment D6	Blue variation	1,585.74	25.24	1,610.98
Regional Segment D7	Blue variation 3	1,780.48	38.99	1,819.47
Regional Segment E1	applicant proposed Purple Route	2,462.07	73.72	2,535.79
Regional Segment E2	applicant proposed Blue Route	2,309.06	62.15	2,371.21
Regional Segment F1	applicant proposed Purple Route	306.02	12.00	318.02
Regional Segment F2	Purple to blue variation 2	319.93	13.40	333.33
Regional Segment F3	Purple to blue variation 3	375.57	6.13	381.70
Regional Segment F4	applicant proposed Blue Route	375.57	7.53	383.10
Regional Segment F5	Blue to purple variation 4	333.84	13.10	346.94
Regional Segment F6	Blue variation	375.57	6.91	382.48
Regional Segment F7	Purple variation	292.11	11.53	303.64
Regional Segment F8	Blue to purple variation 5	375.57	14.36	389.93
Regional Segment G1	applicant proposed Blue Route	3,533.14	305.32	3,838.46
Regional Segment G2	Blue variation	3,421.86	302.17	3,724.03
Regional Segment G3	applicant proposed Purple Route	3,157.57	435.80	3,593.37
Regional Segment G4	Blue to purple variation 2	3,477.50	319.72	3,797.22
Regional Segment G5	Purple variation	3,380.13	411.53	3,791.66
Regional Segment G6	Blue to purple variation 3	3,157.57	365.08	3,522.65

[1] CO_2e calculated by multiplying the GWP for each pollutant by the potential pollutant emissions. GWPs from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024.

https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Minnesota Energy Connection Project
GHG Calculations

Table 2. Summary of Operations GHG Emissions from Fuel Combustion and Electrical Consumption

Regional Segment or Refinement	Association to Applicant Proposed Routes	Fuel Combustion CO2e[1] (metric tons/yr)	Electrical Consumption CO2e[1] (metric tons/yr)	Total CO_2e[1] (metric tons/yr)
All	--	67.71	1,142.46	1,210.17

[1] CO_2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO_2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions.

Minnesota Energy Connection Project
GHG Calculations

Table 3. Conversions

Unit	Amount	Unit
ton	2000	lbs
ton	0.907185	metric tons
ton	907.185	kg
ton	907185	grams
lb	0.453592	kg
lb	453.592	grams
MWh	1000	kWh
hectare	2.47105	acres
1 MJ	0.372506136	hp-h
US gallon (diesel)[1]	144.945	MJ
US gallon (diesel)	53.9929019	hp-h
US gallon (gasoline)[1]	126.833	MJ
US gallon (gasoline)	47.24606261	hp-h
US gallon (jet fuel)[1]	142.2	MJ
US gallon (jet fuel)	52.97036342	hp-h

[1] US Energy Information Administration, 2024.
https://www.eia.gov/energyexplained/units-and-calculators/energy-conversion-calculators.php

[2] https://www.convertunits.com/from/MJ/to/gallon+[U.S.]+of+kerosene+type+jet+fuel

Minnesota Energy Connection Project
GHG Calculations

Table 4. Global Warming Potentials

Greenhouse Gas Name	CAS Number	Chemical Formula	Global Warming Potential (100-yr.) [1]
Carbon dioxide	124–38–9	CO_2	1
Methane	74–82–8	CH_4	28
Nitrous oxide	10024–97–2	N_2O	265

[1] Global Warming Potentials from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Minnesota Energy Connection Project
GHG Calculations

Table 5. Construction Emissions from Fuel Combustion Sources

Regional Segment or Refinement	Association to Applicant Proposed Routes	Route Length[1] (miles)	CO_2e[2] (metric tons)
Regional Segment A1	applicant proposed Purple Route	17.50	2,434.25
Regional Segment A2	Purple variation	17.60	2,448.16
Regional Segment A3	applicant proposed Blue Route	14.60	2,030.86
Regional Segment A4	Blue variation 2	18.10	2,517.71
Regional Segment A5	Blue variation	15.10	2,100.41
Regional Segment A6	Blue variation	14.50	2,016.95
Regional Segment A7	Blue variation	14.60	2,030.86
Regional Segment B1	applicant proposed Purple Route	45.40	6,315.14
Regional Segment B2	Blue to purple variation 2	51.00	7,094.10
Regional Segment B3	Purple variation	46.90	6,523.79
Regional Segment B4	applicant proposed Blue Route	75.30	10,474.23
Regional Segment C1	applicant proposed Purple Route	56.00	7,789.60
Regional Segment C2	Purple to blue variation 2	58.50	8,137.35
Regional Segment C3	Purple to blue variation 3	57.90	8,053.89
Regional Segment C4	applicant proposed Blue Route	28.60	3,978.26
Regional Segment D1	applicant proposed Purple Route	9.10	1,265.81
Regional Segment D2	Purple variation	9.20	1,279.72
Regional Segment D3	Purple to blue variation	10.10	1,404.91
Regional Segment D4	applicant proposed Blue Route	10.80	1,502.28
Regional Segment D5	Blue variation 2	10.90	1,516.19
Regional Segment D6	Blue variation	11.40	1,585.74
Regional Segment D7	Blue variation 3	12.80	1,780.48
Regional Segment E1	applicant proposed Purple Route	17.70	2,462.07
Regional Segment E2	applicant proposed Blue Route	16.60	2,309.06
Regional Segment F1	applicant proposed Purple Route	2.20	306.02
Regional Segment F2	Purple to blue variation 2	2.30	319.93
Regional Segment F3	Purple to blue variation 3	2.70	375.57
Regional Segment F4	applicant proposed Blue Route	2.70	375.57
Regional Segment F5	Blue to purple variation 4	2.40	333.84
Regional Segment F6	Blue variation	2.70	375.57
Regional Segment F7	Purple variation	2.10	292.11
Regional Segment F8	Blue to purple variation 5	2.70	375.57
Regional Segment G1	applicant proposed Blue Route	25.40	3,533.14
Regional Segment G2	Blue variation	24.60	3,421.86
Regional Segment G3	applicant proposed Purple Route	22.70	3,157.57
Regional Segment G4	Blue to purple variation 2	25.00	3,477.50
Regional Segment G5	Purple variation	24.30	3,380.13
Regional Segment G6	Blue to purple variation 3	22.70	3,157.57

[1] Route length obtained from GIS data analysis.

[2] $CO2_e$ and $CO2_e$ rate calculated for the applicants' proposed route, in tons/mile. Route length was obtained from the Route Permit Application, assuming the shortest route combination (highest rate in tons/miles) of the Green Segment and Purple Route.

Proposed Route Fuel Combustion CO_2e (metric tons)	Route Length (miles)	CO_2e Rate (metric tons/mile)
24,217.30	174.10	139.10

Minnesota Energy Connection Project
GHG Calculations

Table 6. Construction Emissions from Off-Road Fuel Combustion Sources - Proposed Route Calculations

Equipment Type[1]	Fuel Type[2]	Number of Units[1]	Operating Time[1] (hours)	Estimated Loaded Horsepower [1]	CO_2 Emission Factor[3] (kg/gal)	CH_4 Emission Factor[4] (g/gal)	N_2O Emission Factor[4] (g/gal)	CO_2 Emission Factor[5] (lb/hr)	CH_4 Emission Factor[5] (lb/hr)	N_2O Emission Factor[5] (lb/hr)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e[6] (metric tons)
Air Compressor	Diesel Equipment	5	14,700	80	10.21	1.01	0.94	33.35	0.00330	0.00307	222.38	2.20E-02	2.05E-02	228.42
ATV	Gasoline (4 stroke) - Recreational	10	12,232	10	8.78	2.72	1.48	4.10	0.00127	0.00069	22.73	7.04E-03	3.83E-03	23.94
Backhoe	Diesel Equipment	4	9,120	60	10.21	1.01	0.94	25.01	0.00247	0.00230	103.48	1.02E-02	9.53E-03	106.29
Bulldozer	Diesel Equipment	8	14,480	250	10.21	1.01	0.94	104.22	0.01031	0.00960	684.54	6.77E-02	6.30E-02	703.14
Compactor	Diesel Equipment	1	200	300	10.21	1.01	0.94	125.07	0.01237	0.01151	11.35	1.12E-03	1.04E-03	11.65
Fork Lift	Diesel Equipment	8	18,956	120	10.21	1.01	0.94	50.03	0.00495	0.00461	430.15	4.26E-02	3.96E-02	441.83
Concrete Mixer Truck	Diesel Equipment	8	23,040	325	10.21	1.01	0.94	135.49	0.01340	0.01247	1,415.97	1.40E-01	1.30E-01	1,454.44
Dump Truck	Diesel Off-Road Trucks	3	11,970	260	10.21	0.91	0.56	108.39	0.00966	0.00595	588.51	5.25E-02	3.23E-02	598.54
Excavator	Diesel Equipment	11	35,900	138	10.21	1.01	0.94	57.53	0.00569	0.00530	936.83	9.27E-02	8.63E-02	962.29
Front End Loader	Diesel Equipment	15	43,040	196	10.21	1.01	0.94	81.71	0.00808	0.00752	1,595.21	1.58E-01	1.47E-01	1,638.55
Generator	Diesel Equipment	3	14,976	125	10.21	1.01	0.94	52.11	0.00516	0.00480	353.99	3.50E-02	3.26E-02	363.61
Boom truck	Diesel Off-Road Trucks	34	58,668	50	10.21	0.91	0.56	20.84	0.00186	0.00114	554.70	4.94E-02	3.04E-02	564.15
Pickup Truck	Diesel Off-Road Trucks	58	229,276	38	10.21	0.91	0.56	15.84	0.00141	0.00087	1,647.52	1.47E-01	9.04E-02	1,675.58
Skid steer loader	Diesel Equipment	20	57,556	50	10.21	1.01	0.94	20.84	0.00206	0.00192	544.19	5.38E-02	5.01E-02	558.97
Water truck	Diesel Off-Road Trucks	5	13,904	50	10.21	0.91	0.56	20.84	0.00186	0.00114	131.46	1.17E-02	7.21E-03	133.70
Welding machine	Diesel Equipment	9	17,405	28	10.21	1.01	0.94	11.67	0.00115	0.00107	92.16	9.12E-03	8.48E-03	94.66
Grader	Diesel Equipment	1	2,880	28	10.21	1.01	0.94	11.67	0.00115	0.00107	15.25	1.51E-03	1.40E-03	15.66
Large Crane	Diesel Equipment	11	30,750	3	10.21	1.01	0.94	1.25	0.00012	0.00012	17.44	1.73E-03	1.61E-03	17.92
Medium Crane	Diesel Equipment	13	46,410	315	10.21	1.01	0.94	131.32	0.01299	0.01209	2,764.47	2.73E-01	2.55E-01	2,839.57
Fuel Truck	Diesel Off-Road Trucks	1	3,000	118	10.21	0.91	0.56	49.19	0.00438	0.00270	66.94	5.97E-03	3.67E-03	68.08
2-inch Water Pump	Diesel Equipment	6	-	3	10.21	1.01	0.94	1.25	0.00012	0.00012	-	0.00E+00	0.00E+00	-
Semitruck/Trailer	Diesel Off-Road Trucks	22	66,480	500	10.21	0.91	0.56	208.45	0.01858	0.01143	6,285.66	5.60E-01	3.45E-01	6,392.70
Light Tower	Diesel Equipment	18	40,500	50	10.21	1.01	0.94	20.84	0.00206	0.00192	382.93	3.79E-02	3.53E-02	393.33
Helicopter - Ground Idle	Jet Fuel	1	345	46	9.75	0.00	0.30	18.31	0.00000	0.00056	2.87	0.00E+00	8.82E-05	2.89
Helicopter - Hover and Climb	Jet Fuel	1	345	305	9.75	0.00	0.30	121.42	0.00000	0.00374	19.00	0.00E+00	5.85E-04	19.16
Helicopter - Approach	Jet Fuel	1	345	161	9.75	0.00	0.30	64.10	0.00000	0.00197	10.03	0.00E+00	3.09E-04	10.11
Helicopter - Flight	Jet Fuel	1	2,185	280	9.75	0.00	0.30	111.47	0.00000	0.00343	110.48	0.00E+00	3.40E-03	111.38
TOTAL	--	--	--	--	--	--	--	--	--	--	**19,010.24**	**1.78**	**1.40**	**19,430.57**

[1] Equipment and usage data obtained from Appendix J of Minnesota Energy Connection Project Route Permit Application.

[2] Fuel type assumed based on equipment type.

[3] CO_2 emissions calculated using the EPA CCCL emission factors for mobile combustion, Table 2: Mobile Combustion CO_2 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Fuel Type	CO2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78
Kerosene-Type Jet Fuel	9.75

[4] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Vehicle Type	Fuel Type	CH4 Emission Factor (g/gal)	N2O Emission Factor (g/gal)
Aircraft	Jet Fuel	-	0.30
Construction/Mining Equipment	Diesel Equipment	1.01	0.94
Construction/Mining Equipment	Diesel Off-Road Trucks	0.91	0.56
Recreational Equipment	Gasoline (4 stroke) - Recreatio	2.72	1.48

[5] Emission factors converted to lb/hr using conversion rates of 53.993 hp-hr/gal for diesel and jet fuel, and 47.246 hp-hr/gal for gasoline.

[6] CO_2e calculated by multiplying the GWP for each pollutant by the potential pollutant emissions. GWPs from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Minnesota Energy Connection Project

GHG Calculations

Table 7. Construction Emissions from On-Road Fuel Combustion Sources - Proposed Route Calculations

Vehicle Type[1]	Fuel Type[1]	Vehicles per Day[1]	Miles per Vehicle[1]	Number of Days[1]	Total Miles Traveled	Fuel Used[1] (gal)	CO_2 Emission Factor[2] (kg/gal)	CH_4 Emission Factor[3][4] (g/vehicle-mile)	N_2O Emission Factor[3][4] (g/vehicle-mile)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e[5] (metric tons)
Commuter Vehicles	Gasoline	210	60	648	8,164,800	371,127	8.78	0.0079	0.0012	3,258.50	6.45E-02	9.80E-03	3,262.90
Delivery Trucks	Diesel	22	60	530	699,600	107,631	10.21	0.0095	0.0431	1,098.91	6.65E-03	3.02E-02	1,107.09
Concrete Mixer Trucks	Diesel	8	60	288	138,240	40,659	10.21	0.0095	0.0431	415.13	1.31E-03	5.96E-03	416.74
TOTAL	--	--	--	--	--	--	--	--	--	**4,772.54**	**0.07**	**0.05**	**4,786.73**

[1] Equipment and usage data obtained from Appendix J of Minnesota Energy Connection Project Route Permit Application.

[2] CO2 emissions calculated using the EPA CCCL emission factors for mobile combustion, T

able 2: Mobile Combustion CO2, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Fuel Type	CO2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78

[3] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for on-road gasoline vehicles,

Table 3: Mobile Combustion CH4 and N2O for On-Road Gasoline Vehicles, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Vehicle Type	Model Year	CH4 Emission Factor (g/gal)	N2O Emission Factor (g/gal)
Gasoline Light-Duty Trucks	2021	0.0079	0.0012

[4] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for on-road diesel vehicles,

Table 4: Mobile Combustion CH4 and N2O for On-Road Diesel and Alternative Fuel Vehicles, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Vehicle Type	Model Year	CH4 Emission Factor (g/gal)	N2O Emission Factor (g/gal)
Medium- and Heavy-Duty Trucks	2007-2021	0.0095	0.0431

[5] CO_2e calculated by multiplying the GWP for each pollutant by the potential pollutant emissions. GWPs from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024.

https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Minnesota Energy Connection Project

GHG Calculations

Table 8. Land Use Change Emission Factor Calculations

Temporary Land Use Change	2022 Net CO_2 Flux for Converted Land Type[1] (M metric tons CO_2e)	2022 Total US Land Use Change from Forest Land[2] (thousands of hectares)	CO_2e Emission Factor (metric tons CO_2e/acre)
Forest Land to Grassland	46.8	3,894	4.86
Cropland to Grassland	(12.5)	11,444	(0.44)
Settlement to Grassland	(0.8)	93	(3.48)
Forest Land to Settlement	58.6	440	53.90
Cropland to Settlement	2.9	1,228	0.96
Grassland to Settlement	7.5	1,648	1.84

[1] Net CO2 flux tables for converted land types. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022.
https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022

[2] Table 6-5: Land Use and Land-Use Change for the U.S. Managed Land Base for All 50 States, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022.
https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022

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Table 9. Construction Emissions from Land Use Change

Regional Segment or Refinement	Association to Applicant Proposed Routes	Temporary Land Use Change from Forest Land to Settlement[1] (acres)	Temporary Land Use Change from Cropland to Settlement[1] (acres)	Temporary Land Use Change from Grassland to Settlement[1] (acres)	CO_2e[2][3] (metric tons)
Regional Segment A1	applicant proposed Purple Route	-	197.00	12.00	34.58
Regional Segment A2	Purple variation	-	193.00	14.00	34.56
Regional Segment A3	applicant proposed Blue Route	5.00	219.00	2.00	79.31
Regional Segment A4	Blue variation 2	5.00	259.00	6.00	86.80
Regional Segment A5	Blue variation	1.00	218.00	12.00	46.74
Regional Segment A6	Blue variation	3.00	185.00	4.00	56.85
Regional Segment A7	Blue variation	3.00	177.00	2.00	54.99
Regional Segment B1	applicant proposed Purple Route	2.00	665.00	30.00	131.27
Regional Segment B2	Blue to purple variation 2	1.00	695.00	24.00	125.31
Regional Segment B3	Purple variation	2.00	615.00	27.00	122.51
Regional Segment B4	applicant proposed Blue Route	7.00	1,082.00	50.00	247.14
Regional Segment C1	applicant proposed Purple Route	-	827.00	8.00	132.34
Regional Segment C2	Purple to blue variation 2	1.00	740.00	19.00	130.87
Regional Segment C3	Purple to blue variation 3	1.00	913.00	5.00	153.81
Regional Segment C4	applicant proposed Blue Route	1.00	354.00	5.00	65.99
Regional Segment D1	applicant proposed Purple Route	1.00	129.00	3.00	30.03
Regional Segment D2	Purple variation	1.00	128.00	2.00	29.57
Regional Segment D3	Purple to blue variation	-	148.00	4.00	24.46
Regional Segment D4	applicant proposed Blue Route	-	152.00	5.00	25.39
Regional Segment D5	Blue variation 2	1.00	152.00	5.00	34.25
Regional Segment D6	Blue variation	-	151.00	5.00	25.24
Regional Segment D7	Blue variation 3	1.00	186.00	3.00	38.99
Regional Segment E1	applicant proposed Purple Route	3.00	275.00	13.00	73.72
Regional Segment E2	applicant proposed Blue Route	3.00	211.00	8.00	62.15
Regional Segment F1	applicant proposed Purple Route	1.00	20.00	-	12.00
Regional Segment F2	Purple to blue variation 2	1.00	27.00	1.00	13.40
Regional Segment F3	Purple to blue variation 3	-	39.00	-	6.13
Regional Segment F4	applicant proposed Blue Route	-	46.00	1.00	7.53
Regional Segment F5	Blue to purple variation 4	1.00	27.00	-	13.10
Regional Segment F6	Blue variation	-	44.00	-	6.91
Regional Segment F7	Purple variation	1.00	17.00	-	11.53
Regional Segment F8	Blue to purple variation 5	1.00	35.00	-	14.36
Regional Segment G1	applicant proposed Blue Route	29.00	281.00	14.00	305.32
Regional Segment G2	Blue variation	29.00	261.00	14.00	302.17
Regional Segment G3	applicant proposed Purple Route	44.00	256.00	19.00	435.80
Regional Segment G4	Blue to purple variation 2	30.00	297.00	24.00	319.72
Regional Segment G5	Purple variation	41.00	263.00	23.00	411.53
Regional Segment G6	Blue to purple variation 3	36.00	257.00	19.00	365.08

[1] Land use areas obtained from the National Land Cover Database for the ROW (75 feet).
[2] See land use change emission factors calculation table.
[3] Emissions are calculated for an assumed 60-day duration of temporary disturabance.

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Table 10. Operation Emissions from Fuel Combustion Sources

Activity[1]	Activity Frequency[1]	Vehicle Type[1]	Fuel Type[1]	Number of Units[1]	Fuel Usage per Activity[1] (gal)	Number of Activity in 12 Years[1]	Annual Fuel Usage[1] (gal)	CO_2 Emission Factor[2] (kg/gal)	CH_4 Emission Factor[3] (g/gal)	N_2O Emission Factor[3] (g/gal)	CO_2 (metric tons/yr)	CH_4 (metric tons/yr)	N_2O (metric tons/yr)	CO_2e[4] (metric tons/yr)
Transmission Line Ground Inspections	Every 4 years	Pickup Truck	Diesel	2	26	3	6.5	10.21	0.91	0.56	0.07	5.92E-06	3.64E-06	0.07
Transmission Line Ground Inspections	Every 4 years	ATV	Gasoline	2	50	3	12.5	8.78	2.72	1.48	0.11	3.40E-05	1.85E-05	0.12
Transmission Line Drone Inspections	Every 4 years, alternating	Pickup Truck	Diesel	1	13	3	3.25	10.21	0.91	0.56	0.03	2.96E-06	1.82E-06	0.03
Transmission Line Aerial Inspections	Annually	Helicopter	Jet A Fuel	1	460.2	12	460.2	9.75	0.00	0.30	4.49	0.00E+00	1.38E-04	4.52
Substation Inspections	Quarterly	Pickup Truck	Diesel	6	40	48	160	10.21	0.91	0.56	1.63	1.46E-04	8.96E-05	1.66
Substation Inspections - Relay Testing	Every 6 years	Chevy Suburban	Gasoline	6	2025	2	337.5	8.78	2.85	1.47	2.96	9.62E-04	4.96E-04	3.12
Vegetation Maintenance - Line Inspection / QC	Every 4 years	Pickup Truck	Gasoline	1	289	3	72.25	8.78	2.85	1.47	0.63	2.06E-04	1.06E-04	0.67
Vegetation Maintenance - Line Inspection / QC	Every 4 years	ATV	Gasoline	1	417	3	104.25	8.78	2.72	1.48	0.92	2.84E-04	1.54E-04	0.96
Vegetation Maintenance - Contractor Foreman	Every 4 years	Pickup Truck	Gasoline	2	2800	3	700	8.78	2.85	1.47	6.15	2.00E-03	1.03E-03	6.47
Vegetation Maintenance - Contractor Foreman	Every 4 years	ATV	Gasoline	2	4167	3	1041.75	8.78	2.72	1.48	9.15	2.83E-03	1.54E-03	9.63
Vegetation Maintenance - Contractor Spray Crew	Every 4 years	Pickup Truck	Gasoline	1	289	3	72.25	8.78	2.85	1.47	0.63	2.06E-04	1.06E-04	0.67
Vegetation Maintenance - Contractor Spray Crew	Every 4 years	ATV	Gasoline	1	417	3	104.25	8.78	2.72	1.48	0.92	2.84E-04	1.54E-04	0.96
Vegetation Maintenance - Contractor Vegetation Crew	Every 4 years	Bucket Truck	Diesel	3	12120	3	3030	10.21	1.01	0.94	30.94	3.06E-03	2.85E-03	31.78
Vegetation Maintenance - Contractor Special Crew	Every 4 years	Mechanical Saw	Diesel	2	1080	3	270	10.21	1.01	0.94	2.76	2.73E-04	2.54E-04	2.83
Vegetation Maintenance - Contractor Lidar Patrol	Every 4 years	Helicopter	Jet A Fuel	1	1709	3	427.25	9.75	0.00	0.30	4.17	0.00E+00	1.28E-04	4.20
TOTAL	--	--	--	--	--	--	--	--	--	--	**65.54**	**0.01**	**7.07E-03**	**67.71**

[1] Fuel data provided electronically by Xcel Energy via Supplemental Information Inquiry #1 on 05/10/2024.

[2] CO_2 emissions calculated using the EPA CCCL emission factors for mobile combustion, Table 2: Mobile Combustion CO_2, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

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Table 10. Operation Emissions from Fuel Combustion Sources

Fuel Type	CO2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78
Kerosene-Type Jet Fuel	9.75

[3] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles, 2024.
https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

Vehicle Type	Fuel Type	CH4 Emission Factor (g/gal)	N2O Emission Factor (g/gal)
Aircraft	Jet Fuel	-	0.30
Construction/Mining Equipment	Gasoline (4 stroke)	2.85	1.47
Construction/Mining Equipment	Diesel Equipment	1.01	0.94
Construction/Mining Equipment	Diesel Off-Road Trucks	0.91	0.56
Recreational Equipment	Gasoline (4 stroke) - Recreational	2.72	1.48

[4] CO_2e calculated by multiplying the GWP for each pollutant by the potential pollutant emissions. GWPs from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024.
https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

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Table 11. Operation Emissions from Land Use Change

Regional Segment or Refinement	Association to Applicant Proposed Routes	Temporary Land Use Change from Forest Land to Grassland[1] (acres)	Temporary Land Use Change from Cropland to Grassland[1] (acres)	Temporary Land Use Change from Settlement to Grassland[1] (acres)	CO_2e[2][3] (metric tons/yr)
Regional Segment A1	applicant proposed Purple Route	-	197	110	(470.01)
Regional Segment A2	Purple variation	-	193	113	(478.68)
Regional Segment A3	applicant proposed Blue Route	5	219	39	(208.25)
Regional Segment A4	Blue variation 2	5	259	60	(299.04)
Regional Segment A5	Blue variation	1	218	43	(241.19)
Regional Segment A6	Blue variation	3	185	73	(321.31)
Regional Segment A7	Blue variation	3	177	83	(352.59)
Regional Segment B1	applicant proposed Purple Route	2	665	127	(726.33)
Regional Segment B2	Blue to purple variation 2	1	695	203	(1,009.02)
Regional Segment B3	Purple variation	2	615	208	(986.20)
Regional Segment B4	applicant proposed Blue Route	7	1,082	225	(1,227.49)
Regional Segment C1	applicant proposed Purple Route	-	827	183	(1,002.61)
Regional Segment C2	Purple to blue variation 2	1	740	304	(1,380.51)
Regional Segment C3	Purple to blue variation 3	1	913	133	(861.70)
Regional Segment C4	applicant proposed Blue Route	1	354	161	(712.08)
Regional Segment D1	applicant proposed Purple Route	1	129	30	(156.59)
Regional Segment D2	Purple variation	1	128	38	(184.00)
Regional Segment D3	Purple to blue variation	-	148	29	(166.37)
Regional Segment D4	applicant proposed Blue Route	-	152	39	(202.95)
Regional Segment D5	Blue variation 2	1	152	40	(201.57)
Regional Segment D6	Blue variation	-	151	51	(244.29)

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Table 11. Operation Emissions from Land Use Change

Regional Segment or Refinement	Association to Applicant Proposed Routes	Temporary Land Use Change from Forest Land to Grassland[1] (acres)	Temporary Land Use Change from Cropland to Grassland[1] (acres)	Temporary Land Use Change from Settlement to Grassland[1] (acres)	CO_2e[2][3] (metric tons/yr)
Regional Segment D7	Blue variation 3	1	186	42	(223.56)
Regional Segment E1	applicant proposed Purple Route	3	275	31	(214.88)
Regional Segment E2	applicant proposed Blue Route	3	211	79	(353.69)
Regional Segment F1	applicant proposed Purple Route	1	20	17	(63.16)
Regional Segment F2	Purple to blue variation 2	1	27	12	(48.85)
Regional Segment F3	Purple to blue variation 3	-	39	8	(45.09)
Regional Segment F4	applicant proposed Blue Route	-	46	1	(23.81)
Regional Segment F5	Blue to purple variation 4	1	27	17	(66.25)
Regional Segment F6	Blue variation	-	44	2	(26.41)
Regional Segment F7	Purple variation	1	17	21	(75.76)
Regional Segment F8	Blue to purple variation 5	1	35	14	(59.34)
Regional Segment G1	applicant proposed Blue Route	29	281	135	(453.12)
Regional Segment G2	Blue variation	29	261	140	(461.69)
Regional Segment G3	applicant proposed Purple Route	44	256	90	(212.46)
Regional Segment G4	Blue to purple variation 2	30	297	101	(336.97)
Regional Segment G5	Purple variation	41	263	111	(303.25)
Regional Segment G6	Blue to purple variation 3	36	257	98	(279.66)

[1] Land use areas obtained from the National Land Cover Database for the ROW (75 feet).

[2] See land use change emission factors calculation table.

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Table 12. Operation Emissions from Electrical Consumption

Source	Energy Consumption[1] (kWh/year)	eGRID Subregion	CO_2 Emission Factor[2] (lb/MWh)	CH_4 Emission Factor[2] (lb/MWh)	N_2O Emission Factor[2] (lb/MWh)	CO_2 (metric tons/year)	CH_4 (metric tons/year)	N_2O (metric tons/year)	CO_2e[3] (metric tons/year)
Garvin Substation	1,060,000	MROW	936.5	0.102	0.015	450.28	0.05	0.01	453.56
Intermediate Substation	700,000	MROW	936.5	0.102	0.015	297.35	0.03	0.00	299.52
Voltage Support Substation	910,000	MROW	936.5	0.102	0.015	386.56	0.04	0.01	389.38
TOTAL	**2,670,000**	**--**	**--**	**--**	**--**	**1,134.19**	**0.12**	**0.02**	**1,142.46**

[1] Electrical consumption provided electronically by Xcel Energy via Supplemental Information Inquiry #1 on 05/10/2024.

[2] Table 6, Electricity. Emission Factors for Greenhouse Gas Inventories, EPA CCCL. February, 2024. https://www.epa.gov/climateleadership/ghg-emission-factors-hub

[3] CO_2e calculated by multiplying the GWP for each pollutant by the potential pollutant emissions. GWPs from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024. https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Minnesota

Local office

Minnesota-Wisconsin Ecological Services Field Office

(952) 858-0793

3815 American Blvd East
Bloomington, MN 55425-1659

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

NAME	STATUS
Whooping Crane Grus americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN

Clams

NAME	STATUS
Salamander Mussel Simpsonaias ambigua Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6208	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Prairie Bush-clover Lespedeza leptostachya Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4458	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

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 conservation 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

Bald and Golden Eagle information is not available at this time

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

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 conservation 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 bird information is not available at this time

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain

types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

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.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
KANDIYOHI COUNTY WATERFOWL PRODUCTION AREA	33,350.07 acres
LYON COUNTY WATERFOWL PRODUCTION AREA	369.38 acres
YELLOW MEDICINE COUNTY WATERFOWL PRODUCTION AREA	457.93 acres

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Natural Heritage Information System Records of State Special Concern Species Documented within One Mile of the Project

Scientific Name	Common Name	Type	State Status	Federal Status	Habitat[1]
Anaxyrus cognatus	Great plains toad	Toad	Special concern	Not listed	Formerly occurred in the extensive dry tallgrass prairie and open grasslands but is now found primarily in agricultural areas and in tiny remnant prairies and grasslands.
Argynnis idalia	Regal fritillary	Butterfly	Special concern	Not listed	Native prairie.
Astragalus flexuosus var. flexuosus	Slender milk-vetch	Vascular plant	Special concern	Not listed	Dry prairies and in mesic prairies, and most commonly in hill prairies, which are frequently dry-mesic in nature.
Astragalus missouriensis var. missouriensis	Missouri milk-vetch	Vascular plant	Special concern	Not listed	Dry prairies on glacial till, and primarily in dry sand-gravel prairies or in dry, sandy areas within hill prairies.
Atrytone arogos iowa	Iowa skipper	Butterfly	Special concern	Not listed	Mesic to dry mesic native prairie.
Buellia nigra	A species of lichen	Fungus	Special concern	Not listed	Non-calcareous rock in sunny exposed areas, sometimes near the edge of hardwood forests.
Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed	Large tracts of mature deciduous forests with scattered wetlands.
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed	Rock outcrops, fire dependent forests, savannas, upland prairies.
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed	Southern dry prairies and southern dry savannas, and to a lesser extent drier examples of southern mesic prairies and woodlands (central dry pine woodland and central poor dry pine woodland with scattered oaks or Jack pine.
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed	Littoral zone of lakes, marshes.

Scientific Name	Common Name	Type	State Status	Federal Status	Habitat[1]
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed	Mesic prairies with deep soil.
Falco peregrinus	Peregrine falcon	Bird	Special concern	Not listed	Cliff ledges along rivers and lakes.
Gallinula galeata	Common gallinule	Bird	Special concern	Not listed	Freshwater cattail-bulrush marshes (northern) and prairie.
Gymnocladus dioica	Kentucky coffee tree	Vascular plant	Special concern	Not listed	Mesic hardwood forests on terraces of the Minnesota River, the Mississippi River below the Twin Cities, and a few major tributaries
Lasmigona compressa	Creek heelsplitter	Mussel	Special concern	Not listed	Small rivers and streams.
Leucophaeus pipixcan	Franklin's gull	Bird	Special concern	Not listed	Large prairie marshes.
Ligumia recta	Black sandshell	Mussel	Special concern	Not listed	Large and medium rivers and streams.
Necturus maculosus	Mudpuppy	Salamander	Special concern	Not listed	Rivers, lakes, reservoirs, and sluggish streams.
Onychomys leucogaster	Northern grasshopper mouse	Mouse	Special concern	Not listed	Sites with gravelly or coarse soils, including active and inactive quarry sites. They occur in a variety of upland prairie habitats, most often in areas with sparse vegetation.
Opuntia macrorhiza	Devil's tongue	Vascular plant	Special concern	Not listed	Margins of bedrock exposures and in associated dry prairie communities, specifically in thin, dry soil over granite, quartzite, and gneiss
Panax quinquefolius	American ginseng	Vascular plant	Special concern	Not listed	Well-developed forest soil, typically mesic loamy soil. In most cases, the forests have a closed canopy of mature sugar maple, basswood, or northern red oak.
Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed	Well-drained, loose sandy and gravel soils in dry sand prairies and bluff prairies.

Scientific Name	Common Name	Type	State Status	Federal Status	Habitat[1]
Pleurobema sintoxia	Round pigtoe	Mussel	Special concern	Not listed	Medium to large rivers.
Progne subis	Purple martin	Bird	Special concern	Not listed	Open fields, streams and rivers, and open water habitats including wetlands, marshes, and lakes.
Sterna forsteri	Forster's tern	Bird	Special concern	Not listed	Extensive marshes with an interspersion of emergent vegetation and open water
Trillium nivale	Snow trillium	Vascular plant	Special concern	Not listed	Mesic hardwood forests dominated by sugar maple, basswood, and oaks.
Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed	Open habitat, preferring dry well-drained soils for burrowing.
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed	Shrub thickets, clumps, and edges within or bordering open habitats such as grasslands or wetlands.

[1] Habitat information is from Rare Species Guide available here: https://www.dnr.state.mn.us/rsg/index.html.

					Region A																				
				Regional Segment	A1 (Purple Route)			A2			A3 (Blue Route)			A4			A5			A6			A7		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
Scientific Name	Common Name	Type	State Status	Federal Status																					
Ammodramus henslowii	Henslow's sparrow	Bird	Endangered	Not listed									X			X						X			X
Juglans cinerea	Butternut	Vascular plant	Endangered	Not listed																					
Lampsilis teres	Yellow sandshell	Mussel	Endangered	Not listed																					
Lanius ludovicianus	Loggerhead shrike	Bird	Endangered	Not listed																					
Oarisma poweshiek	Poweshiek skipperling	Butterfly	Endangered	Endangered							X	X	X	X	X	X				X	X	X	X	X	X
Rallus elegans	King rail	Bird	Endangered	Not listed																					
Simpsonaias ambigua	Salamander mussel	Mussel	Endangered	Not listed																					
Actinonaias ligamentina	Mucket	Mussel	Threatened	Not listed																					
Alasmidonta marginata	Elktoe	Mussel	Threatened	Not listed																					
Asclepias sullivantii	Sullivant's milkweed	Vascular plant	Threatened	Not listed																					
Bacopa rotundifolia	Waterhyssop	Vascular plant	Threatened	Not listed			X			X															
Berula erecta	Stream parsnip	Vascular plant	Threatened	Not listed															X						
Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed																					
Eurynia dilatata	Spike	Mussel	Threatened	Not listed																					
Lasmigona costata	Fluted-shell	Mussel	Threatened	Not listed																					
Lespedeza leptostachya	Prairie bush clover	Vascular plant	Threatened	Threatened																					
Minuartia dawsonensis	Rock sandwort	Vascular plant	Threatened	Not listed																					
Quadrula nodulata	Wartyback	Mussel	Threatened	Not listed																					
Anaxyrus cognatus	Great plains toad	Toad	Special concern	Not listed																					
Argynnis idalia	Regal fritillary	Butterfly	Special concern	Not listed							X	X	X	X	X	X				X	X	X	X	X	X
Astragalus flexuosus var. flexuosus	Slender milk-vetch	Vascular plant	Special concern	Not listed																					
Astragalus missouriensis var. missouriensis	Missouri milk-vetch	Vascular plant	Special concern	Not listed																					
Atrytone arogos iowa	Iowa skipper	Butterfly	Special concern	Not listed																					
Buellia nigra	A species of lichen	Fungus	Special concern	Not listed																					
Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed																					
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed																					
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed																					
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed																					
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed																					
Falco peregrinus	Peregrine falcon	Bird	Special concern	Not listed																					
Gallinula galeata	Common gallinule	Bird	Special concern	Not listed																					
Gymnocladus dioica	Kentucky coffee tree	Vascular plant	Special concern	Not listed																					
Lasmigona compressa	Creek heelsplitter	Mussel	Special concern	Not listed									X			X			X	X	X	X	X	X	X
Leucophaeus pipixcan	Franklin's gull	Bird	Special concern	Not listed																					
Ligumia recta	Black sandshell	Mussel	Special concern	Not listed																					
Necturus maculosus	Mudpuppy	Salamander	Special concern	Not listed																					
Onychomys leucogaster	Northern grasshopper mouse	Mouse	Special concern	Not listed								X	X					X	X		X	X		X	X
Opuntia macrorhiza	Devil's tongue	Vascular plant	Special concern	Not listed																					
Panax quinquefolius	American ginseng	Vascular plant	Special concern	Not listed																					
Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed																					
Pleurobema sintoxia	Round pigtoe	Mussel	Special concern	Not listed																					
Progne subis	Purple martin	Bird	Special concern	Not listed																					
Sterna forsteri	Forster's tern	Bird	Special concern	Not listed																					
Trillium nivale	Snow trillium	Vascular plant	Special concern	Not listed			X			X			X			X		X	X			X			X
Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed																					
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed																					

					Region B											
				Regional Segment	B1 (Purple Route)			B2			B3			B4 (Blue Route)		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
Scientific Name	Common Name	Type	State Status	Federal Status												
Ammodramus henslowii	Henslow's sparrow	Bird	Endangered	Not listed												
Juglans cinerea	Butternut	Vascular plant	Endangered	Not listed												
Lampsilis teres	Yellow sandshell	Mussel	Endangered	Not listed		X	X		X	X		X	X			
Lanius ludovicianus	Loggerhead shrike	Bird	Endangered	Not listed												
Oarisma poweshiek	Poweshiek skipperling	Butterfly	Endangered	Endangered												
Rallus elegans	King rail	Bird	Endangered	Not listed	X	X	X				X	X	X			
Simpsonaias ambigua	Salamander mussel	Mussel	Endangered	Not listed		X	X		X	X		X	X			
Actinonaias ligamentina	Mucket	Mussel	Threatened	Not listed	X	X	X	X	X	X	X	X	X			X
Alasmidonta marginata	Elktoe	Mussel	Threatened	Not listed		X	X		X	X		X	X			
Asclepias sullivantii	Sullivant's milkweed	Vascular plant	Threatened	Not listed			X			X			X			
Bacopa rotundifolia	Waterhyssop	Vascular plant	Threatened	Not listed			X			X			X			
Berula erecta	Stream parsnip	Vascular plant	Threatened	Not listed												
Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed												
Eurynia dilatata	Spike	Mussel	Threatened	Not listed	X	X	X	X	X	X	X	X	X			
Lasmigona costata	Fluted-shell	Mussel	Threatened	Not listed	X	X	X	X	X	X	X	X	X			
Lespedeza leptostachya	Prairie bush clover	Vascular plant	Threatened	Threatened												X
Minuartia dawsonensis	Rock sandwort	Vascular plant	Threatened	Not listed												
Quadrula nodulata	Wartyback	Mussel	Threatened	Not listed												X
Anaxyrus cognatus	Great plains toad	Toad	Special concern	Not listed												
Argynnis idalia	Regal fritillary	Butterfly	Special concern	Not listed												
Astragalus flexuosus var. flexuosus	Slender milk-vetch	Vascular plant	Special concern	Not listed												
Astragalus missouriensis var. missouriensis	Missouri milk-vetch	Vascular plant	Special concern	Not listed			X			X			X			
Atrytone arogos iowa	Iowa skipper	Butterfly	Special concern	Not listed												
Buellia nigra	A species of lichen	Fungus	Special concern	Not listed												X
Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed												
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed			X			X			X			
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed												
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed												
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed										X	X	X
Falco peregrinus	Peregrine falcon	Bird	Special concern	Not listed												
Gallinula galeata	Common gallinule	Bird	Special concern	Not listed												
Gymnocladus dioica	Kentucky coffee tree	Vascular plant	Special concern	Not listed												
Lasmigona compressa	Creek heelsplitter	Mussel	Special concern	Not listed						X						X
Leucophaeus pipixcan	Franklin's gull	Bird	Special concern	Not listed												
Ligumia recta	Black sandshell	Mussel	Special concern	Not listed	X	X	X	X	X	X	X	X	X			
Necturus maculosus	Mudpuppy	Salamander	Special concern	Not listed			X			X			X			
Onychomys leucogaster	Northern grasshopper mouse	Mouse	Special concern	Not listed												
Opuntia macrorhiza	Devil's tongue	Vascular plant	Special concern	Not listed												X
Panax quinquefolius	American ginseng	Vascular plant	Special concern	Not listed												
Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed												
Pleurobema sintoxia	Round pigtoe	Mussel	Special concern	Not listed		X	X		X	X		X	X			
Progne subis	Purple martin	Bird	Special concern	Not listed												
Sterna forsteri	Forster's tern	Bird	Special concern	Not listed						X						
Trillium nivale	Snow trillium	Vascular plant	Special concern	Not listed												
Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed										X	X	X
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed												

					Region C											
				Regional Segment	C1 (Purple Route)			C2			C3			C4 (Blue Route)		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
Scientific Name	Common Name	Type	State Status	Federal Status												
Ammodramus henslowii	Henslow's sparrow	Bird	Endangered	Not listed												
Juglans cinerea	Butternut	Vascular plant	Endangered	Not listed												
Lampsilis teres	Yellow sandshell	Mussel	Endangered	Not listed												
Lanius ludovicianus	Loggerhead shrike	Bird	Endangered	Not listed												
Oarisma poweshiek	Poweshiek skipperling	Butterfly	Endangered	Endangered												
Rallus elegans	King rail	Bird	Endangered	Not listed												
Simpsonaias ambigua	Salamander mussel	Mussel	Endangered	Not listed												
Actinonaias ligamentina	Mucket	Mussel	Threatened	Not listed												
Alasmidonta marginata	Elktoe	Mussel	Threatened	Not listed												
Asclepias sullivantii	Sullivant's milkweed	Vascular plant	Threatened	Not listed												
Bacopa rotundifolia	Waterhyssop	Vascular plant	Threatened	Not listed												
Berula erecta	Stream parsnip	Vascular plant	Threatened	Not listed												
Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed												
Eurynia dilatata	Spike	Mussel	Threatened	Not listed												
Lasmigona costata	Fluted-shell	Mussel	Threatened	Not listed												
Lespedeza leptostachya	Prairie bush clover	Vascular plant	Threatened	Threatened												
Minuartia dawsonensis	Rock sandwort	Vascular plant	Threatened	Not listed												
Quadrula nodulata	Wartyback	Mussel	Threatened	Not listed												
Anaxyrus cognatus	Great plains toad	Toad	Special concern	Not listed			X						X			
Argynnis idalia	Regal fritillary	Butterfly	Special concern	Not listed												
Astragalus flexuosus var. flexuosus	Slender milk-vetch	Vascular plant	Special concern	Not listed												
Astragalus missouriensis var. missouriensis	Missouri milk-vetch	Vascular plant	Special concern	Not listed												
Atrytone arogos iowa	Iowa skipper	Butterfly	Special concern	Not listed	X	X	X									
Buellia nigra	A species of lichen	Fungus	Special concern	Not listed												
Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed												
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed												
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed												
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed												
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed	X	X	X						X			
Falco peregrinus	Peregrine falcon	Bird	Special concern	Not listed												
Gallinula galeata	Common gallinule	Bird	Special concern	Not listed												
Gymnocladus dioica	Kentucky coffee tree	Vascular plant	Special concern	Not listed			X									
Lasmigona compressa	Creek heelsplitter	Mussel	Special concern	Not listed												
Leucophaeus pipixcan	Franklin's gull	Bird	Special concern	Not listed					X	X		X	X		X	X
Ligumia recta	Black sandshell	Mussel	Special concern	Not listed												
Necturus maculosus	Mudpuppy	Salamander	Special concern	Not listed												
Onychomys leucogaster	Northern grasshopper mouse	Mouse	Special concern	Not listed												
Opuntia macrorhiza	Devil's tongue	Vascular plant	Special concern	Not listed												
Panax quinquefolius	American ginseng	Vascular plant	Special concern	Not listed												
Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed												
Pleurobema sintoxia	Round pigtoe	Mussel	Special concern	Not listed												
Progne subis	Purple martin	Bird	Special concern	Not listed						X			X			X
Sterna forsteri	Forster's tern	Bird	Special concern	Not listed					X	X		X	X		X	X
Trillium nivale	Snow trillium	Vascular plant	Special concern	Not listed												
Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed												
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed												

					Region D																				
				Regional Segment	D1 (Purple Route)			D2			D3			D4 (Blue Route)			D5			D6			D7		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
Scientific Name	Common Name	Type	State Status	Federal Status																					
Ammodramus henslowii	Henslow's sparrow	Bird	Endangered	Not listed																					
Juglans cinerea	Butternut	Vascular plant	Endangered	Not listed																					
Lampsilis teres	Yellow sandshell	Mussel	Endangered	Not listed																					
Lanius ludovicianus	Loggerhead shrike	Bird	Endangered	Not listed																					
Oarisma poweshiek	Poweshiek skipperling	Butterfly	Endangered	Endangered																					
Rallus elegans	King rail	Bird	Endangered	Not listed																					
Simpsonaias ambigua	Salamander mussel	Mussel	Endangered	Not listed																					
Actinonaias ligamentina	Mucket	Mussel	Threatened	Not listed																					
Alasmidonta marginata	Elktoe	Mussel	Threatened	Not listed																					
Asclepias sullivantii	Sullivant's milkweed	Vascular plant	Threatened	Not listed																					
Bacopa rotundifolia	Waterhyssop	Vascular plant	Threatened	Not listed																					
Berula erecta	Stream parsnip	Vascular plant	Threatened	Not listed																					
Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed																					
Eurynia dilatata	Spike	Mussel	Threatened	Not listed																					
Lasmigona costata	Fluted-shell	Mussel	Threatened	Not listed																					
Lespedeza leptostachya	Prairie bush clover	Vascular plant	Threatened	Threatened																					
Minuartia dawsonensis	Rock sandwort	Vascular plant	Threatened	Not listed																					
Quadrula nodulata	Wartyback	Mussel	Threatened	Not listed																					
Anaxyrus cognatus	Great plains toad	Toad	Special concern	Not listed																					
Argynnis idalia	Regal fritillary	Butterfly	Special concern	Not listed																					
Astragalus flexuosus var. flexuosus	Slender milk-vetch	Vascular plant	Special concern	Not listed																					
Astragalus missouriensis var. missouriensis	Missouri milk-vetch	Vascular plant	Special concern	Not listed																					
Atrytone arogos iowa	Iowa skipper	Butterfly	Special concern	Not listed																					
Buellia nigra	A species of lichen	Fungus	Special concern	Not listed																					
Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed																					
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed																					
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed																					
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed																					
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed																					
Falco peregrinus	Peregrine falcon	Bird	Special concern	Not listed																					
Gallinula galeata	Common gallinule	Bird	Special concern	Not listed																					
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Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed																					
Pleurobema sintoxia	Round pigtoe	Mussel	Special concern	Not listed																					
Progne subis	Purple martin	Bird	Special concern	Not listed																					
Sterna forsteri	Forster's tern	Bird	Special concern	Not listed																					
Trillium nivale	Snow trillium	Vascular plant	Special concern	Not listed																					
Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed																					
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed																					

					Region E					
				Regional Segment	E1 (Purple Route)			E2 (Blue Route)		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
Scientific Name	Common Name	Type	State Status	Federal Status						
Ammodramus henslowii	Henslow's sparrow	Bird	Endangered	Not listed						
Juglans cinerea	Butternut	Vascular plant	Endangered	Not listed						
Lampsilis teres	Yellow sandshell	Mussel	Endangered	Not listed						
Lanius ludovicianus	Loggerhead shrike	Bird	Endangered	Not listed				X	X	X
Oarisma poweshiek	Poweshiek skipperling	Butterfly	Endangered	Endangered						
Rallus elegans	King rail	Bird	Endangered	Not listed						
Simpsonaias ambigua	Salamander mussel	Mussel	Endangered	Not listed						
Actinonaias ligamentina	Mucket	Mussel	Threatened	Not listed						
Alasmidonta marginata	Elktoe	Mussel	Threatened	Not listed						
Asclepias sullivantii	Sullivant's milkweed	Vascular plant	Threatened	Not listed						
Bacopa rotundifolia	Waterhyssop	Vascular plant	Threatened	Not listed						
Berula erecta	Stream parsnip	Vascular plant	Threatened	Not listed						
Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed			X			X
Eurynia dilatata	Spike	Mussel	Threatened	Not listed						
Lasmigona costata	Fluted-shell	Mussel	Threatened	Not listed						
Lespedeza leptostachya	Prairie bush clover	Vascular plant	Threatened	Threatened						
Minuartia dawsonensis	Rock sandwort	Vascular plant	Threatened	Not listed						
Quadrula nodulata	Wartyback	Mussel	Threatened	Not listed						
Anaxyrus cognatus	Great plains toad	Toad	Special concern	Not listed						
Argynnis idalia	Regal fritillary	Butterfly	Special concern	Not listed						
Astragalus flexuosus var. flexuosus	Slender milk-vetch	Vascular plant	Special concern	Not listed						
Astragalus missouriensis var. missouriensis	Missouri milk-vetch	Vascular plant	Special concern	Not listed						
Atrytone arogos iowa	Iowa skipper	Butterfly	Special concern	Not listed						
Buellia nigra	A species of lichen	Fungus	Special concern	Not listed						
Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed						
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed						
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed						
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed						
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed						
Falco peregrinus	Peregrine falcon	Bird	Special concern	Not listed						
Gallinula galeata	Common gallinule	Bird	Special concern	Not listed						
Gymnocladus dioica	Kentucky coffee tree	Vascular plant	Special concern	Not listed						
Lasmigona compressa	Creek heelsplitter	Mussel	Special concern	Not listed						
Leucophaeus pipixcan	Franklin's gull	Bird	Special concern	Not listed						
Ligumia recta	Black sandshell	Mussel	Special concern	Not listed						
Necturus maculosus	Mudpuppy	Salamander	Special concern	Not listed						
Onychomys leucogaster	Northern grasshopper mouse	Mouse	Special concern	Not listed						
Opuntia macrorhiza	Devil's tongue	Vascular plant	Special concern	Not listed						
Panax quinquefolius	American ginseng	Vascular plant	Special concern	Not listed						
Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed						
Pleurobema sintoxia	Round pigtoe	Mussel	Special concern	Not listed						
Progne subis	Purple martin	Bird	Special concern	Not listed						
Sterna forsteri	Forster's tern	Bird	Special concern	Not listed						
Trillium nivale	Snow trillium	Vascular plant	Special concern	Not listed						
Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed						
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed				X	X	X

					Region F																							
				Regional Segment	F1 (Purple Route)			F2			F3			F4 (Blue Route)			F5			F6			F7			F8		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
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Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed	X	X	X	X	X	X	X	X	X			X			X			X	X	X	X			X
Eurynia dilatata	Spike	Mussel	Threatened	Not listed																								
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Urocitellus richardsonii	Richardson's ground squirrel	Squirrel	Special concern	Not listed																								
Vireo bellii	Bell's vireo	Bird	Special concern	Not listed																								

					Region G																
				Regional Segment	G1 (Blue Route)			G2			G3 (Purple Route)			G4			G5			G6		
				Buffer	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile	ROW	Route Width	1-Mile
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Lanius ludovicianus	Loggerhead shrike	Bird	Endangered	Not listed			X			X			X			X			X			X
Oarisma poweshiek	Poweshiek skipperling	Butterfly	Endangered	Endangered																	
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Emydoidea blandingii	Blanding's turtle	Turtle	Threatened	Not listed		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Eurynia dilatata	Spike	Mussel	Threatened	Not listed																	
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Buteo lineatus	Red-shouldered hawk	Bird	Special concern	Not listed			X			X			X			X			X			X
Chondestes grammacus	Lark sparrow	Bird	Special concern	Not listed			X			X											
Cirsium pumilum var. hillii	Hill's thistle	Vascular plant	Special concern	Not listed			X			X			X			X			X			X
Cygnus buccinator	Trumpeter swan	Bird	Special concern	Not listed									X			X			X			X
Cypripedium candidum	Small white lady's-slipper	Vascular plant	Special concern	Not listed																	
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Gallinula galeata	Common gallinule	Bird	Special concern	Not listed		X	X		X	X											
Gymnocladus dioica	Kentucky coffee tree	Vascular plant	Special concern	Not listed																	
Lasmigona compressa	Creek heelsplitter	Mussel	Special concern	Not listed									X			X			X			X
Leucophaeus pipixcan	Franklin's gull	Bird	Special concern	Not listed																	
Ligumia recta	Black sandshell	Mussel	Special concern	Not listed			X			X			X			X			X			X
Necturus maculosus	Mudpuppy	Salamander	Special concern	Not listed																	
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Panax quinquefolius	American ginseng	Vascular plant	Special concern	Not listed												X						X
Pituophis catenifer	Gophersnake	Snake	Special concern	Not listed																	
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DEPARTMENT OF NATURAL RESOURCES

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

February 20, 2024
Correspondence # MCE-2023-00889

Angela Durand
Merjent, Inc.

RE: Natural Heritage Review of the proposed **Minnesota Energy Connection Project - Blue Route**, Kandiyohi, Lyon, Meeker, Redwood, Renville, Sherburne, Stearns County

Dear Angela Durand,

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

Ecologically Significant Areas

- The Minnesota Biological Survey (MBS) has identified **8** Sites of *Moderate* Biodiversity Significance in the vicinity of the proposed project. 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. 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. **Please see your MCE-generated Conservation Planning Report for a comprehensive list of MBS Sites of Biodiversity Significance (attached).**

  There are **21** MN DNR Native Plant Communities (NPCs) within 330 feet of the proposed project. Of these 1 is **critically imperiled** (S1), 17 are **imperiled** (S2), and 3 are **vulnerable to extirpation** (S3) in Minnesota. **Please see your MCE-generated Conservation Planning Report for a comprehensive list of Native Plant Communities in your proposed project area (attached).**

  Activities in road rights-of-way (ROW) can negatively affect adjacent native plant communities, especially through the introduction of invasive plant species. As such, disturbance near these ecologically significant areas should be minimized. Actions to minimize disturbance may include, but are not limited to, the following recommendations:

- As much as possible, operate within already-disturbed areas.
- Confine construction activities to the opposite side of the road from MBS Sites and rare NPCs (S1-S3). If this is not feasible, confine construction activities to the existing road rights-of-way.
- Retain a buffer between proposed activities and both MBS Sites and rare NPCs (S1-S3).
- Minimize vehicular disturbance in the area (allow only vehicles necessary for the proposed work).
- Do not park equipment or stockpile supplies in the area.
- Do not place spoil within MBS Sites or other sensitive areas.
- If possible, conduct the work under frozen ground conditions.
- Inspect and clean all equipment prior to bringing it to the site to prevent the introduction and spread of invasive species.
- Use effective erosion prevention and sediment control measures.
- Revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible.
- Use only weed-free mulches, topsoils, and seed mixes. Of particular concern is birdsfoot trefoil (*Lotus corniculatus*) and crown vetch (*Coronilla varia*), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas, such as roadsides.

Construction in streambeds, lakes, and wetlands should be avoided whenever possible. We recommend either changing the cable alignment to avoid such areas, employing directional boring techniques to install cable under the area, or attaching the cable to roadway bridges passing over such areas. Additional actions to minimize disturbance may include, but are not limited to, the following recommendations:

- Work in watercourses should be conducted during low flow whenever possible.
- If possible, conduct the work under frozen ground conditions.
- Wetland basins, lake beds, and stream/riverbeds should be restored to preconstruction contours. The work should not promote wetland drainage.
- Appropriate wildlife friendly erosion control measures, such as fabric, straw bales, mulch, and silt fences should be used to prevent sedimentation of adjacent wetlands, lakes, or watercourses.

- Impacts to existing vegetation should be kept to a minimum. Disturbed soil areas should be reseeded with native species suitable to the local habitat immediately upon project completion.

The Minnesota Biological Survey (MBS) considered the area surrounding the proposed project for a Site of Biodiversity Significance. There are **12 areas** that were determined to be ***Below*** the minimum biodiversity threshold for statewide significance. This area, however, 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. **As such, indirect impacts from surface runoff or the spread of invasive species should be considered during project design and implementation.**

MBS Sites of Biodiversity Significance and DNR Native Plant Communities can be viewed using the Explore page in Minnesota Conservation Explorer or their GIS shapefiles can be downloaded from the MN Geospatial Commons. Please contact the NH Review Team if you need assistance accessing the data. Reference the MBS Site Biodiversity Significance and Native Plant Community websites for information on interpreting the data. To receive a list of MBS Sites of Biodiversity Significance and DNR Native Plant Communities in the vicinity of your project, create a Conservation Planning Report **using the Explore Tab** in Minnesota Conservation Explorer. **I have attached a Conservation Planning Report to this review.**

- If the Wetland Conservation Act (WCA) is applicable to this project, please note that wetlands within rare (S1-S3) Native Plant Communities (NPC) may qualify as "Rare Natural Communities" under this Act. Minnesota Rules, part 8420.0515, subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines the proposed activities will permanently adversely affect the natural community. 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.

State-listed Species

- Henslow's sparrows (*Centronyx henslowii*), a state-listed endangered bird species, have been documented in the vicinity of the proposed project. Suitable nesting habitat for this species includes uncultivated and unmowed grasslands and old fields with standing, dead vegetation, and a substantial litter layer. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. As such, initial disturbance in these areas should not occur during their breeding season, between May 15th and July 15th. **If avoidance during breeding season is not feasible, areas that will be disturbed that contain suitable nesting habitat will need to be surveyed for active nests prior to any project**

disturbance. Surveys must follow the standards contained in the Rare Species Survey Process. Visit the Natural Heritage Review page for a list of certified surveyors and more information on this process. Please consult with the NH Review Team at Reports.NHIS@state.mn.us with subject line MCE-2023-00889 if you have any questions regarding this process.

- Butternut (*Juglans cinerea*), a state-listed endangered tree species, has been documented in the project vicinity. Most populations of this species in Minnesota are located in mature, mesic hardwood forests. This species is very susceptible to a lethal fungal disease called butternut canker (*Sirococcus clavigignenti-juglandacearum*). Nearly all of Minnesota's butternut populations are dead or dying from the fungus, triggering the protected status of this tree within the state. As this species has been documented in the vicinity of the proposed project, **a qualified surveyor is required to conduct a botanical survey of any trees in the proposed project area that are proposed to be removed.**

  Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. Surveys must be conducted by a qualified surveyor and follow the standards contained in the Rare Species Survey Process and Rare Plant Guidance. Visit the Natural Heritage Review page for a list of certified surveyors and more information on this process. Project planning should take into account that any botanical survey needs to be conducted during the appropriate time of the year, which may be limited. Please consult with the NH Review Team at Reports.NHIS@state.mn.us with subject line MCE-2023-00889 if you have any questions regarding this process.

- Prairie bush clover (*Lespedeza leptostachya*), a federally and state-listed threatened plant species, and small white lady's slipper (*Cypripedium candidum*), a plant species of special concern, have been documented in the project vicinity. **To avoid impacting state protected plants, all native prairie habitats and all rock outcrop habitats must be avoided.** If avoidance is not feasible, a botanical survey will be needed. Please see your MCE-generated Conservation Planning Report for a comprehensive list of prairie and rock outcrop habitats in the vicinity of the proposed project (attached).

  Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. Surveys must be conducted by a qualified surveyor and follow the standards contained in the Rare Species Survey Process and Rare Plant Guidance. Visit the Natural Heritage Review page for a list of certified surveyors and more information on this process. Project planning should take into account that any botanical survey needs to be conducted during the appropriate time of the year, which may be limited. Please consult with the NH Review Team at Reports.NHIS@state.mn.us with subject line MCE-2023-00889 if you have any questions regarding this process.

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the vicinity of the proposed project. Blanding's turtles use upland areas up to and over a mile distant from wetlands, waterbodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added mortality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

  This project has the potential to impact this rare turtle through direct fatalities and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. As such, **the following avoidance measures are required**:

  - Avoid wetland and aquatic impacts during hibernation season, between September 15th and April 15th, if the area is suitable for hibernation.
  - Erosion and sediment control should be limited to wildlife friendly erosion control to avoid the inadvertent take of Blanding's turtles.
  - Hydro-mulch products should not contain any materials with synthetic (plastic) fiber additives, as the fibers can re-suspend and flow into waterbodies.
  - Construction areas, especially aquatic or wetland areas, should be thoroughly checked for turtles before the use of heavy equipment or any ground disturbance.
    - The Blanding's turtle flyer must be given to all contractors working in the area.
    - Monitor for turtles during construction. Report any sightings to Reports.NHIS@state.mn.us; please include date, observer, location, and photograph of the Blanding's turtle.
    - Holes that have been left unattended for prolonged periods should be checked for Blanding's turtles before being filled.
    - If turtles are in imminent danger, they must be moved by hand out of harm's way, otherwise they are to be left undisturbed. Directions on how to move turtles safely can be found here: Helping Turtles Across the Road.
  - If the above avoidance measures are not feasible, please contact Review.NHIS@state.mn.us with subject line MCE-2023-00889 as further action may be needed.

For additional information, see the Blanding's turtle fact sheet, which describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. **Please refer to both lists of recommendations and apply those that are relevant to your project.**

- Wartyback (*Pustulosa nodulata*) and mucket (*Actinonaias ligamentina*), both state-listed threatened mussels have been documented in the Minnesota River in the project vicinity. Black sandshell (*Ligumia recta*) and creek heelsplitter (*Lasmigona compressa*), both state-listed species of special concern, have been documented in the Mississippi River in the project vicinity. Additionally, creek heelsplitter was also documented in the Cottonwood River in the project vicinity. These species are vulnerable to deterioration in water quality, particularly increased siltation. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. **Therefore, it is important that stringent erosion prevention and sediment control practices are maintained throughout the duration of the project to prevent adverse debris and material from impacting downstream populations.** As per proposed project details, waterbodies will be spanned, and no work is proposed within the water. If project details change and work within water is proposed, please contact the NH Review team at Review.NHIS@state.mn.us with subject line MCE-2023-00889 as rare species surveys may be needed.

- 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 nearby, all seven 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.**

- 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.

Federally Protected Species

- To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

- As mentioned above, prairie bush clover (*Lespedeza leptostachya*) is also federally listed as threatened.

Environmental Review and Permitting

- Please include a copy of this letter and the MCE-generated Final Project Report in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

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 project description provided with the request. If project details change or the project has not occurred within one year, please resubmit the project for review within one year of 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. Visit the Natural Heritage Review website for additional information regarding this process, survey guidance, and other related information. 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,

Molly Barrett

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Natural Heritage Review Specialist
Molly.Barrett@state.mn.us

Cc: Melissa Collins, Regional Environmental Assessment Ecologist, Region 3 (Central)
Cc: Haley Byron, Regional Environmental Assessment Ecologist, Region 4 (South)
Cc: Amanda Weise, Regional Ecologist, Region 3 (Central)

Cc: Megan Benage, Regional Ecologist, Region 4 (South)
Cc: Jennie Skancke, Wetlands Program Coordinator
Cc: Cynthia Warzecha, Energy Projects Review

DEPARTMENT OF NATURAL RESOURCES

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

February 20, 2024
Correspondence # MCE 2023-00890

Angela Durand
Merjent, Inc.

RE: Natural Heritage Review of the proposed **Minnesota Energy Connection Project - Purple Route,** Chippewa, Kandiyohi, Lyon, Meeker, Renville, Sherburne, Stearns, Wright, Yellow Medicine County

Dear Angela Durand,

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

Ecologically Significant Areas

- A calcareous fen, **Gennessee** 21 (Fen ID 25251), has been documented within five miles of the proposed project (T119N R33W Section 21). A calcareous fen is a rare and distinctive peat-accumulating wetland that is legally protected in Minnesota. The Wetlands Conservation Act (WCA), authorized by Minnesota Statutes, section 103G.223, states that calcareous fens may not be filled, drained, or otherwise degraded, wholly or partially, by any activity, except as provided for in a management plan approved by the commissioner of the Department of Natural Resources. Many of the unique characteristics of calcareous fens result from the upwelling of groundwater through calcareous substrates. Because of this dependence on groundwater hydrology, calcareous fens can be affected by nearby activities or even those several miles away. For more information regarding calcareous fens, please see the Calcareous Fen Fact Sheet. To minimize stormwater impacts, please refer to the Minnesota Pollution Control Agency's General Principles for Erosion Prevention and Sediment Control in the Minnesota Stormwater Manual. Please note that calcareous fens are "Special Waters" and a buffer zone may be required.

  Calcareous fens may be impacted by activities within the fen, activities that affect surface water flows (e.g., stormwater flow, erosion), or activities that affect groundwater hydrology (e.g.,

groundwater pumping, contamination, discharge, or excavation). **To ensure compliance under WCA, please contact the Calcareous Fen Program Coordinator, Keylor Andrews** (Keylor.Andrews@state.mn.us).

- The Minnesota Biological Survey (MBS) has identified **1** Site of *High* and **19** Sites of *Moderate* Biodiversity Significance in the vicinity of the proposed project. 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. 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. **Please see your MCE-generated Conservation Planning Report for a comprehensive list of MBS Sites of Biodiversity Significance (attached).**

  There are **25** MN DNR Native Plant Communities (NPCs) within 330 feet of the proposed project. Of these 1 is **critically imperiled** (S1), 13 are **imperiled** (S2), and 1 is **vulnerable to extirpation** (S3) in Minnesota. **Please see your MCE-generated Conservation Planning Report for a comprehensive list of Native Plant Communities in your proposed project area (attached).**

  Activities in road rights-of-way (ROW) can negatively affect adjacent native plant communities, especially through the introduction of invasive plant species. As such, disturbance near these ecologically significant areas should be minimized. Actions to minimize disturbance may include, but are not limited to, the following recommendations:

  - As much as possible, operate within already-disturbed areas.
  - Confine construction activities to the opposite side of the road from MBS Sites and rare NPCs (S1-S3). If this is not feasible, confine construction activities to the existing road rights-of-way.
  - Retain a buffer between proposed activities and both MBS Sites and rare NPCs (S1-S3).
  - Minimize vehicular disturbance in the area (allow only vehicles necessary for the proposed work).
  - Do not park equipment or stockpile supplies in the area.
  - Do not place spoil within MBS Sites or other sensitive areas.
  - If possible, conduct the work under frozen ground conditions.
  - Inspect and clean all equipment prior to bringing it to the site to prevent the introduction and spread of invasive species.
  - Use effective erosion prevention and sediment control measures.

- Revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible.
- Use only weed-free mulches, topsoils, and seed mixes. Of particular concern is birdsfoot trefoil (*Lotus corniculatus*) and crown vetch (*Coronilla varia*), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas, such as roadsides.

Construction in streambeds, lakes, and wetlands should be avoided whenever possible. We recommend either changing the cable alignment to avoid such areas, employing directional boring techniques to install cable under the area, or attaching the cable to roadway bridges passing over such areas. Additional actions to minimize disturbance may include, but are not limited to, the following recommendations:

- Work in watercourses should be conducted during low flow whenever possible.
- If possible, conduct the work under frozen ground conditions.
- Wetland basins, lake beds, and stream/riverbeds should be restored to preconstruction contours. The work should not promote wetland drainage.
- Appropriate wildlife friendly erosion control measures, such as fabric, straw bales, mulch, and silt fences should be used to prevent sedimentation of adjacent wetlands, lakes, or watercourses.
- Impacts to existing vegetation should be kept to a minimum. Disturbed soil areas should be reseeded with native species suitable to the local habitat immediately upon project completion.

The Minnesota Biological Survey (MBS) considered the area surrounding the proposed project for a Site of Biodiversity Significance. There are **19 areas** that were determined to be ***Below*** the minimum biodiversity threshold for statewide significance. This area, however, 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. **As such, indirect impacts from surface runoff or the spread of invasive species should be considered during project design and implementation.**

MBS Sites of Biodiversity Significance and DNR Native Plant Communities can be viewed using the Explore page in Minnesota Conservation Explorer or their GIS shapefiles can be downloaded from the MN Geospatial Commons. Please contact the NH Review Team if you need assistance accessing the data. Reference the MBS Site Biodiversity Significance and Native Plant Community websites for information on interpreting the data. To receive a list of MBS Sites of Biodiversity Significance and DNR Native Plant Communities in the vicinity of your project, create a

Conservation Planning Report using the Explore Tab in Minnesota Conservation Explorer. **I have attached a Conservation Planning Report to this review.**

- If the Wetland Conservation Act (WCA) is applicable to this project, please note that wetlands within rare (S1-S3) Native Plant Communities (NPC) may qualify as "Rare Natural Communities" under this Act. Minnesota Rules, part 8420.0515, subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines the proposed activities will permanently adversely affect the natural community. 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.

State-listed Species

- Sullivant's milkweed (*Asclepias sullivantii*) and waterhyssop (*Bacopa rotundifolia*), both state-listed threatened plant species, and small white lady's slipper (*Cypripedium candidum*), a plant species of special concern, have been documented in the project vicinity. **To avoid impacting state protected plants, all native prairie habitats and all rock outcrop habitats must be avoided.** If avoidance is not feasible, a botanical survey will be needed. Please see your MCE-generated Conservation Planning Report for a comprehensive list of prairie and rock outcrop habitats in the vicinity of the proposed project (attached).

  Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. Surveys must be conducted by a qualified surveyor and follow the standards contained in the Rare Species Survey Process and Rare Plant Guidance. Visit the Natural Heritage Review page for a list of certified surveyors and more information on this process. Project planning should take into account that any botanical survey needs to be conducted during the appropriate time of the year, which may be limited. Please consult with the NH Review Team at Reports.NHIS@state.mn.us with subject line MCE-2023-00890 if you have any questions regarding this process.

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the vicinity of the proposed project. Blanding's turtles use upland areas up to and over a mile distant from wetlands, waterbodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added mortality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

This project has the potential to impact this rare turtle through direct fatalities and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. As such, **the following avoidance measures are required:**

- Avoid wetland and aquatic impacts during hibernation season, between September 15th and April 15th, if the area is suitable for hibernation.
- Erosion and sediment control should be limited to wildlife friendly erosion control to avoid the inadvertent take of Blanding's turtles.
- Hydro-mulch products should not contain any materials with synthetic (plastic) fiber additives, as the fibers can re-suspend and flow into waterbodies.
- Construction areas, especially aquatic or wetland areas, should be thoroughly checked for turtles before the use of heavy equipment or any ground disturbance.
    - The Blanding's turtle flyer must be given to all contractors working in the area.
    - Monitor for turtles during construction. Report any sightings to Reports.NHIS@state.mn.us; please include date, observer, location, and photograph of the Blanding's turtle.
    - Holes that have been left unattended for prolonged periods should be checked for Blanding's turtles before being filled.
    - If turtles are in imminent danger, they must be moved by hand out of harm's way, otherwise they are to be left undisturbed. Directions on how to move turtles safely can be found here: Helping Turtles Across the Road.
- If the above avoidance measures are not feasible, please contact Review.NHIS@state.mn.us with subject line MCE-2023-00890 as further action may be needed.

For additional information, see the Blanding's turtle fact sheet, which describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. **Please refer to both lists of recommendations and apply those that are relevant to your project.**

- Black sandshell (*Ligumia recta*), a state-listed mussel species of special concern, has been documented in the Mississippi River in the project vicinity. Creek heelsplitter (*Lasmigona compressa*), a state-listed mussel species of special concern, has been documented in the Clearwater River in the project vicinity. Mudpuppy (*Necturus maculosus*), a state-listed salamander species of special concern, has been documented in the Minnesota River in the

project vicinity. These species are vulnerable to deterioration in water quality, particularly increased siltation. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. **Therefore, it is important that stringent erosion prevention and sediment control practices are maintained throughout the duration of the project to prevent adverse debris and material from impacting downstream populations.** As per proposed project details, waterbodies will be spanned, and no work is proposed within the water. If project details change and work within water is proposed, please contact the NH Review team at Review.NHIS@state.mn.us with subject line MCE-2023-00890 as rare species surveys may be needed.

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