Draft Environmental Impact Statement

ESSAR STEEL 230 kV HVTL

In the Matter of the Essar Steel Application for a 230 Kilovolt High Voltage Transmission Line Route Permit in Itasca County.

PUC DOCKET #E280/TL-09-512

Prepared by Wenck Associates, Inc. for

office of energy security

85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

February 2010

ABSTRACT

Responsible Governmental Unit

Office of Energy Security
Energy Facility Permitting
85 7th Place E, Suite 500
St. Paul, MN 55101-2198

Project Owner

Nashwauk Public Utilities Commission
301 Central Avenue
Nashwauk, MN 55769

OES Representative

William C. Storm
State Planning Director
651-296-9535
bill.storm@state.mn.us

Project Representative

Bryan Adams
Project Manager
218-855-1210
badams@nashwauk@mchsi.com

The Public Utilities Commission (Commission) is considering the Proposed Project by Nashwauk Public Utilities Commission and Minnesota Power for the Essar Steel Transmission Line.

The Proposed Project consists of four new 230 kV transmission lines and two new substations to be located in Nashwauk, Itasca County, Minnesota.

This Draft Environmental Impact Statement (EIS) was produced to satisfy the environmental review requirements for the Project.

Additional information on the Project is available in the Project application listed in the References section of this Draft EIS. Other material related to this docket is available on line at: http://energyfacilities.puc.state.mn.us/Docket.html

This Draft EIS was released on February 12, 2010. Comments on the adequacy of the Draft EIS will be accepted until Friday, April 2, 2010. Comments should be sent by email or U.S. mail to:

Bill Storm, Project Manager
Minnesota Department of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101-2198
Email: bill.storm@state.mn.us

Following the comment period, the Draft EIS will be revised to incorporate comments and a Final EIS will be issued.

LIST OF PREPARERS/CONTRIBUTORS

- William C. Storm, State Planning Director
  Office of Energy Security, Energy Facility Permitting
- Wenck Associates, Inc.
- Supplemental information not contained in the Application was provided by the Applicant through Barr Engineering Company.

Table of Contents

ABSTRACT ..... **i**

TABLE OF CONTENTS ..... **ii**

ACRONYMS ..... **x**

DEFINITIONS ..... **xi**

EXECUTIVE SUMMARY **EX-1**

1.0 INTRODUCTION **1-1**

1.1 Draft EIS Document Layout 1-1
1.2 Project Description And Location 1-2
1.3 Purpose And Need 1-3
1.4 Route Descriptions 1-3
1.5 Substation Descriptions 1-5
1.6 Route Width 1-5
1.7 Rights-of-Way 1-6
1.8 Schedule 1-6
1.9 Project Cost 1-7

2.0 REGULATORY PROCESS **2-1**

2.1 Power Plant Siting Act – Minnesota Rule 7850 2-1
2.1.1 Route Permit Application 2-2
2.1.2 Environmental Information 2-2
2.1.3 Environmental Review 2-3
2.1.4 Public Hearing 2-4
2.1.5 Final Decision 2-4
2.2 Certificate Of Need Process 2-4

3.0 ENGINEERING AND OPERATIONAL DESIGN **3-1**

3.1 HVTL System Component Design 3-1
3.2 Transmission Line Conductors 3-2
3.3 Transmission Line Structures 3-2
3.4 Substations 3-3
3.5 Design Options For Future Expansion 3-3
3.6 Undergrounding Options 3-4
3.7 Right-of-Way Requirements 3-4

4.0 CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION **4-1**

4.1 Right-Of-Way Acquisition Process 4-1
4.2 Construction Of Transmission Line And Structures 4-1
4.2.1 Right-of-Way Access 4-1
4.2.2 Grading 4-2
4.2.3 Structure Installation 4-2
4.2.4 Conductor Installation 4-2
4.3 Substations 4-3

Table of Contents (Cont.)

4.4 Restoration 4-3
4.5 Damage Compensation 4-4
4.6 Maintenance 4-4
4.6.1 Transmission Line 4-4
4.6.2 Substation 4-4

5.0 AFFECTED ENVIRONMENT 5-1

5.1 Description of Environmental Setting 5-2
5.2 Description of Socioeconomic Setting 5-2
5.3 Human Settlement 5-4
5.3.1 Proximity to Structures and Displacement 5-4
5.3.2 Property Values 5-6
5.3.3 Aesthetics 5-7
5.3.4 Noise 5-8
5.3.5 Interference 5-9
5.3.6 Public Health and Safety 5-11
5.4 Land-Based Economics 5-14
5.4.1 Agriculture 5-14
5.4.1.1 Prime Farmland 5-15
5.4.1.2 Livestock 5-16
5.4.2 Mining And Forestry 5-16
5.4.2.1 Mining 5-16
5.4.2.2 Forestry 5-17
5.4.3 Zoning And Land Use Compatibility 5-17
5.4.4 Transportation And Public Services 5-18
5.4.4.1 Existing Utilities 5-18
5.4.4.2 Public Services 5-19
5.4.4.3 Highways and Roads 5-19
5.4.4.4 Railways 5-19
5.4.4.5 Airports 5-19
5.4.5 Recreation 5-19
5.4.5.1 Recreational Trails 5-20
5.4.5.2 Parks 5-20
5.4.5.3 Recreational Land 5-21
5.4.6 Archaeological And Historic Resources 5-21
5.5 Natural Environment 5-24
5.5.1 Air Quality 5-24
5.5.1.1 Criteria Pollutants 5-24
5.5.1.2 Greenhouse Gases 5-26
5.5.2 Water Resources 5-26
5.5.2.1 Surface Water 5-26
5.5.2.2 Floodzones 5-28
5.5.2.3 Ground Water 5-29
5.5.3 Wetlands 5-29
5.5.3.1 Regulatory Framework 5-29
5.5.3.2 Existing Conditions 5-30
5.5.4 Flora and Fauna 5-32
5.5.4.1 Vegetation 5-32
5.5.4.2 Wildlife 5-33

Table of Contents (Cont.)

5.5.4.3 Fisheries 5-34
5.5.5 Rare and Unique Natural Resources/Critical Habitat 5-35
5.5.5.1 Regulatory Framework 5-35
5.5.5.2 Existing Conditions 5-35

6.0 ENVIRONMENTAL IMPACTS AND MITIGATION 6-1

6.1 Shannon End of 94 Line to Essar Steel Plant Substation – Route 1 And Route 1a 6-2
6.1.1 Human Settlement 6-3
6.1.1.1 Proximity to Structures and Displacement 6-3
6.1.1.2 Property Values 6-4
6.1.1.3 Aesthetics 6-6
6.1.1.4 Noise 6-8
6.1.1.5 Interference 6-9
6.1.1.6 Public Health and Safety 6-10
6.1.2 Land-based Economics 6-11
6.1.2.1 Agriculture 6-12
6.1.2.2 Mining and Forestry 6-13
6.1.2.3 Zoning and Land Use Compatibility 6-15
6.1.2.4 Transportation and Public Services 6-15
6.1.2.5 Recreation 6-20
6.1.2.6 Archaeological and Historic Resources 6-21
6.1.3 Natural Environment 6-21
6.1.3.1 Air Quality 6-22
6.1.3.2 Water Resources 6-23
6.1.3.3 Wetlands 6-25
6.1.3.4 Flora and Fauna 6-27
6.1.3.5 Rare and Unique Resources/Critical Habitat 6-31
6.2 Boswell End of 94 Line to Essar Steel Mine Substation 6-34
6.2.1 Human Settlement 6-34
6.2.1.1 Proximity to Structures and Displacement 6-34
6.2.1.2 Property Values 6-35
6.2.1.3 Aesthetics 6-36
6.2.1.4 Noise 6-38
6.2.1.5 Interference 6-38
6.2.1.6 Public Health and Safety 6-39
6.2.2 Land-based Economics 6-40
6.2.2.1 Agriculture 6-41
6.2.2.2 Mining and Forestry 6-42
6.2.2.3 Zoning and Land Use Compatibility 6-43
6.2.2.4 Transportation and Public Services 6-44
6.2.2.5 Recreation 6-48
6.2.2.6 Archaeological and Historic Resources 6-49
6.2.3 Natural Environment 6-50
6.2.3.1 Air Quality 6-50
6.2.3.2 Water Resources 6-50
6.2.3.3 Wetlands 6-53
6.2.3.4 Flora and Fauna 6-56
6.2.3.5 Rare and Unique Resources and Critical Habitat 6-59
6.3 Blackberry Substation to Essar Steel Plant Substation 6-64

Table of Contents (Cont.)

6.3.1 Human Settlement 6-64
6.3.1.1 Proximity to Structures and Displacement 6-64
6.3.1.2 Property Values 6-65
6.3.1.3 Aesthetics 6-66
6.3.1.4 Noise 6-67
6.3.1.5 Interference 6-68
6.3.1.6 Public Health and Safety 6-69
6.3.2 Land-based Economics 6-70
6.3.2.1 Agriculture 6-70
6.3.2.2 Mining and Forestry 6-72
6.3.2.3 Zoning and Land Use Compatibility 6-73
6.3.2.4 Transportation and Public Services 6-74
6.3.2.5 Recreation 6-80
6.3.2.6 Archaeological and Historic Resources 6-80
6.3.3 Natural Environment 6-81
6.3.3.1 Air Quality 6-81
6.3.3.2 Water Resources 6-81
6.3.3.3 Wetlands 6-84
6.3.3.4 Flora and Fauna 6-86
6.3.3.5 Rare and Unique Resources and Critical Habitat 6-89
6.4 Essar Steel Mine Substation to Essar Steel Plant Substation 6-94
6.4.1 Human Settlement 6-94
6.4.1.1 Proximity to Structures and Displacement 6-94
6.4.1.2 Property Values 6-95
6.4.1.3 Aesthetics 6-95
6.4.1.4 Noise 6-96
6.4.1.5 Interference 6-97
6.4.1.6 Public Health and Safety 6-98
6.4.2 Land-based Economics 6-99
6.4.2.1 Agriculture 6-99
6.4.2.2 Mining and Forestry 6-101
6.4.2.3 Zoning and Land Use Compatibility 6-102
6.4.2.4 Transportation and Public Services 6-103
6.4.2.5 Recreation 6-108
6.4.2.6 Archaeological and Historic Resources 6-108
6.4.3 Natural Environment 6-109
6.4.3.1 Air Quality 6-109
6.4.3.2 Water Resources 6-109
6.4.3.3 Wetlands 6-111
6.4.3.4 Flora and Fauna 6-113
6.4.3.5 Rare and Unique Resources and Critical Habitat 6-116
6.5 Rejected alternative routes 6-120
6.6 Substation and Alternatives 6-120
6.6.1 Human Settlement 6-121
6.6.1.1 Proximity to Structures and Displacement 6-121
6.6.1.2 Property Values 6-122
6.6.1.3 Aesthetics 6-122
6.6.1.4 Noise 6-123
6.6.1.5 Interference 6-123

Table of Contents (Cont.)

6.6.1.6 Public Health and Safety 6-123
6.6.2 Land-based Economics 6-124
6.6.2.1 Agriculture 6-124
6.6.2.2 Mining and Forestry 6-124
6.6.2.3 Zoning and Land Use Compatibility 6-125
6.6.2.4 Transportation and Public Services 6-125
6.6.2.5 Recreation 6-125
6.6.2.6 Archaeological and Historic Resources 6-126
6.6.3 Natural Environment 6-127
6.6.3.1 Air Quality 6-127
6.6.3.2 Water Resources 6-127
6.6.3.3 Wetlands 6-127
6.6.3.4 Flora and Fauna 6-127
6.6.3.5 Rare and Unique Natural Resources/Critical Habitat 6-128

7.0 SUMMARY OF UNAVOIDABLE IMPACTS 7-1

7.1 Significant Unavoidable Adverse Impacts 7-1
7.2 Irreversible/Irretrievable Commitment of Resources 7-2

8.0 REQUIRED PERMITS AND APPROVALS 8-1

8.1 Federal 8-2
8.2 State of Minnesota 8-2
8.3 Local 8-4
8.4 Exemptions 8-4

9.0 REFERENCES 9-1

Table of Contents (Cont.)

LIST OF TABLES

Table EX-1: General Summary of Potential Impacts and Mitigation EX-6
Table 1-1: Route Corridor Widths for Determining Final Alignment (in feet) 1-6
Table 3-1: ROW Adjacent to Proposed Routes (Miles) 3-4
Table 5-1: Draft EIS Analysis Areas 5-1
Table 5-2: Poverty Level and Income in 2000 5-3
Table 5-3: Racial Characteristics Within Study Area, Itasca County, and Minnesota 5-3
Table 5-4: Top Three Industries in Itasca County 5-4
Table 5-5: Number of Houses Within Each Route 5-5
Table 5-6: Houses Within 500 Feet of Route Alignment 5-5
Table 5-7: Single Family Housing Sales 2009 Statistics for the Grand Rapids Area[1] 5-6
Table 5-8: Decibel Levels of Common Noise Sources 5-8
Table 5-9: Applicable Minnesota Noise Standards 5-8
Table 5-10: Agriculture-Related Land Cover in the Proposed Project 5-15
Table 5-11: Farmland Soils 5-15
Table 5-12: Existing Electrical Lines 5-18
Table 5-13: Architectural Sites Within One Mile of the Proposed Routes 5-22
Table 5-14: National Ambient Air Quality Standards 5-25
Table 5-15: Additional Minnesota Ambient Air Quality Standards 5-25
Table 5-16: River and Creeks Within the Project Area. 5-27
Table 5-17: Lakes and Basins Within One Mile of the Proposed HVTL Routes. 5-27
Table 5-18: Wetlands In Route 1 and Route 1A 5-30
Table 5-19: Wetlands in Route 1 and Route 1A (by Circular 39 Wetland Type) 5-30
Table 5-20: Wetlands in Route 2 and 2A 5-31
Table 5-21: Wetlands in Route 2 and 2A (by Circular 39 Wetland Type) 5-31
Table 5-22: Wetlands in Route 3 and 3A 5-31
Table 5-23: Wetlands in Route 3 and 3A (by Circular 39 Wetland Type) 5-31
Table 5-24: Wetlands in Route 4 and 4A 5-32
Table 5-25: Wetlands in Route 4 and 4A (by Circular 39 Wetland Type) 5-32
Table 5-26: Land Cover Information for the Proposed HVTL Routes 5-33
Table 5-27: NHIS Database Records of Plant Species in Vicinity of Proposed Project 5-36
Table 5-28: NHIS Database Records of Plant Species in Vicinity of Proposed Project 5-37
Table 6-1: ATF Alignments 6-1
Table 6-2: Number of Residences Proximate to Proposed Alignment 6-3
Table 6-3: Farmland Soils Within ROW 6-12
Table 6-4: Agricultural Land Cover Within ROW 6-13
Table 6-5: Forestry Impacts Within ROW 6-14
Table 6-6: AADT for Route 1 HVTL Alignment Crossings 6-17
Table 6-7: AADT for Route 1A HVTL Alignment Crossings 6-18
Table 6-8: Wetlands Within Route 1 and Route 1A Proposed HVTL Row 6-25
Table 6-9: 2008 NASS Land Cover Analysis for Each HVTL Alignment 6-28
Table 6-10: Routes 1 and 1A and ATF Alignment Summary of Potentials Effects 6-32
Table 6-11: Number of Residences Proximate to Proposed Alignment 6-35
Table 6-12: Farmland Soils within ROW 6-41
Table 6-13: Agricultural Land Cover within ROW 6-41
Table 6-14: Forestry Impacts Within ROW 6-43
Table 6-15: AADT for Route 2 HVTL Alignment Crossings 6-47
Table 6-16: AADT for Route 2A HVTL Alignment Crossings 6-47

Table of Contents (Cont.)

Table 6-17: Wetlands Within Route 2 and Route 2A Proposed HVTL ROW 6-54
Table 6-18: 2008 NASS Land Cover Analysis for Each HVTL Alignment 6-56
Table 6-19: Routes 2 and 2A and ATF Alignment Summary of Potentials Effects 6-61
Table 6-20: Number of Residences Proximate to Proposed Alignment 6-64
Table 6-21: Farmland Soils Within ROW 6-71
Table 6-22: Agricultural Land Cover Within ROW 6-71
Table 6-23: Forestry Impacts Within ROW 6-73
Table 6-24: AADT for Route 3 HVTL Alignment Crossings 6-77
Table 6-25: AADT for Route 3A HVTL Alignment Crossings 6-77
Table 6-26: Wetlands Within Route 3 and 3A Proposed HVTL ROW 6-84
Table 6-27: 2008 NASS Land Cover Analysis for Each HVTL Alignment 6-87
Table 6-28: Routes 3 and 3A and ATF Group Alignment Summary of Potential Effects 6-91
Table 6-29: Number of Residences Proximate to Proposed Alignment 6-94
Table 6-30: Farmland Soils Within ROW 6-100
Table 6-31: Agricultural Land Cover Within ROW 6-100
Table 6-32: Forestry Impacts Within ROW 6-102
Table 6-33: AADT for Route 4 HVTL Alignment Crossings 6-105
Table 6-34: AADT for Route 4A HVTL Alignment Crossings 6-105
Table 6-35: Wetlands Within Route 4 and 4A Proposed HVTL ROW 6-111
Table 6-36: 2008 NASS Land Cover Analysis for Each HVTL Alignment 6-114
Table 6-37: Routes 4 and 4A and ATF Group Alignment Summary of Potential Effects 6-118
Table 8-1: Potentially Required Permits and Approvals 8-1

LIST OF FIGURES

1 Study Area
2 Route 1 and 1A
3 Route 2 and 2A
4 Route 3 and 3A
5 Route 4 and 4A and Substations
6 General Location Map
7 Detailed Route Map - Route 1 and 1A
8 Detailed Route Map - Route 2 and 2A
9 Detailed Route Map - Route 3 and 3A
10 Detailed Route Map - Route 4 and 4A
11 Prime Farmland Soils
12 Mining and Forestry Resources
13 Zoning
14 Infrastructure (Railroads, Utilities, Pipelines, Roads)
15 Recreation (trails and public lands)
16 Water Resources
17 NWI Wetlands
18 2008 NASS Land Cover
19 Rare and Unique Natural Resources

Table of Contents (Cont.)

ILLUSTRATIONS

Illustration 2-1: Commission Permitting Process 2-1
Illustration 3-1: Single Circuit HVTL Consisting of Three Phases and One Shield Wire 3-1
Illustration 3-2: Typical High Voltage Transmission Line Designs 3-2
Illustration 4-1: Right-of-Way Clearing for New HVTL Pole Placement. 4-2
Illustration 4-2: Augering Holes for Structure Pole. 4-2
Illustration 4-3: Stringing a New HVTL 4-2
Illustration 4-4: Conductor Spooling and Connection at Substation 4-3
Illustration 5-1: Residential Properties Sold in Grand Rapids Area 5-6
Illustration 5-2: Estimated Annual Property Market Growth 5-7
Illustration 5-3: Electromagnetic Spectrum 5-11
Illustration 6-1: Examples of Route Alignments Analyzed in Draft EIS 6-22

LIST OF APPENDICES

Appendix A Final Scoping Decision Document
Appendix B Advisory Task Force Report
Appendix C Example of Approved Route Permit
Appendix D Preliminary Substation Plans
Appendix E Rejected Routes

Acronyms

AADT Average Annual Daily Traffic
AC Alternating current
ACSR Aluminum conductor steel reinforced
AFT Advisory Task Force
ATV All-terrain vehicle
BMPs Best Management Practices
BNSF Burlington Northern Santa Fe
BWSR Minnesota Board of Water and Soil Resources
CFR Code of Federal Regulation
CH_4 Methane
CO Carbon Monoxide
CO_2 Carbon Dioxide
CON Certificate of Need
CR County Road
CRP Conservation Reserve Program
CSAH County State Aid Highway
CWA Clean Water Act
dB(A) decibels (A-weighted)
DDT Dichlorodiphenyltrichloroethane
DEED Department of Employment and Economic Development
DOC Department of Commerce
EHS Extra high strength
EIS Environmental Impact Statement
ELF Extremely low frequency
EMF Electric and magnetic fields
EMI Electromagnetic interference
FAA Federal Aviation Administration
FCC Federal Communications Commission
FEMA Federal Emergency Management Agency
FSDD Final Scoping Decision Document
G Gauss
GIA Grant-in-Aid Program
GIS Geographic Information System
HFCs Hydrofluorocarbons
HVTL High voltage transmission line
ICD implantable cardioverter defibrillators
kV Kilovolt
kV/m Kilovolts per meter
LPTV Low-power television stations
mA MilliAmperes
MCBS Minnesota County Biological Survey
MCML Minnesota Certified Master Logger
MDE Minnesota Department of Education
mG MilliGauss
mHz MegaHertz
MLS Multiple listing service
MNDNR Minnesota Department of Natural Resources
MNDOT Minnesota Department of Transportation
MPCA Minnesota Pollution Control Agency
MW Megawatts
N_2O Nitrous Oxide
NAAQS National Ambient Air Quality Standards
NAC Noise area classification
NASS National Agricultural Statistics Service
NESC National Electrical Safety Code
NHIS Natural Heritage Information System
NHPA National Historic Preservation Act
NPDES National Pollutant Discharge Elimination System
NPUC Nashwauk Public Utilities Commission
NRCS Natural Resource Conservation Service
NRHP National Register of Historic Places
NWI National Wetlands Inventory
OES Office of Energy Security
OPGW Fiber optic ground wire
OSHA Occupational Safety and Health Act
PFCs Perfluorocarbons
PM Particulate Matter
PM_{10} Particulate Matter (less than 10µm)
$PM_{2.5}$ Particulate Matter (less than 2.5 µm)
ppb Parts per Billion
ppm Parts per Million
PUC Minnesota Public Utilities Commission
PWI Public Waters Inventory
RAPID Research and Public Information Dissemination
ROW Right-of-way
SF_6 Sulfur Hexafluoride
SGCN Species in Greatest Conservation Need
SHPO State Historic Preservation Office
SNAs Scientific and Natural Areas
SO_2 Sulfur Dioxide
Sq-ft Square feet
Std Standard
SWANCC Solid Waste Agency of Northern Cook County.
SWCD Itasca County Soil and Water Conservation District
SWPPP Storm Water Pollution Prevention Plan
TH Trunk Highway
TMDL Total Maximum Daily Load
U.S. United States
UHF Ultra-high frequency
USACE U.S. Army Corps of Engineers
USCB U.S. Census Bureau
USEPA U.S Environmetnal Protection Agency
USFWS U.S. Fish and Wildlife Service
WCA Wetland Conservation Act
WMAs Wildlife Management Areas

Definitions

Best Management Practices (BMPs): The schedule of activities, prohibition of practices, maintenance procedures, and other management practices to avoid or minimize pollution or habitat destruction to the environment. BMPs can also include treatment requirements, operating procedures and practices to control runoff, spillage or leaks, or drainage from raw material storage.

Criteria Pollutant: Seven Common Pollutants for which USEPA has set primary and/or secondary national air quality standards. These pollutants are particulate matter less than or equal to 10 microns in size, particulate matter less than or equal to 2.5 microns in size, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. These pollutants can harm health and the environment, and cause property damage. Of the six pollutants, particle pollution and ground-level ozone are the most widespread health threats. EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.

Decibels (dBA): A unit of sound pressure level, weighted for the purpose of determining the human response to sound.

Electric Field: An electric field is produced by voltage and is made up of invisible lines that surround any electrical device that is plugged in and turned on. The strength of the electric field increases with increasing voltage and changes in the strength of an electric field generates a magnetic field.

Final Scoping Decision Document (FSDD): The purpose of a Scoping Decision Document is to identify those project alternatives and environmental impact issues that will be addressed in the EIS. A Scoping Decision Document also presents a tentative schedule of the environmental review process.

Greenhouse gases: Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds (IPCC).

Hazardous Materials: Potentially toxic waste materials that can cause harm or contamination within the environment and must be handled and disposed of according to Minnesota regulations.

Henshaw Effect: Dr. D.L. Henshaw, et al. have researched their theory that there is a link between the electric fields associated with HVTLs and an increased risk of cancer.

High Voltage Transmission Line: A conductor of electricity and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length.

Hydrology: The science dealing with the origin, distribution and circulation of waters of the earth such as rainfall, streamflow, infiltration, evaporation, and groundwater storage.

L_{10}: The sound level exceeded 10 percent of the time, which is typically the most intrusive, represents short term peaks in noise levels.

L_{50}: The sound level exceeded 50 percent of the time, which typically represents the median noise level.

Magnetic Field: Invisible lines that surround any electrical device that is plugged in and turned on created by the flow of current through wires. Magnetic fields increase in strength with increasing current and exert forces on moving electric charges. Changes in magnetic fields cause electric fields.

Microwave signal: Microwave signals are typically used for utility communicatiosn. Microwave antennas utilize unidirectional signals that have shorter wavelengths and are focused in one direction.

Mitigation: The practice of lessening, moderating, or offsetting project related impacts.

NPDES Permit: National Pollutant Discharge Elimination System permit means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of Clean Water Act.

NPDES/SDS Permit: An NPDES/SDS Permit is a document that establishes the terms and conditions that must be met when a facility discharges wastewater to surface or groundwaters of the state. The permit is jointly issued under two programs. The National Pollutant Discharge Elimination System (NPDES) is a federal program established under the Clean Water Act, aimed at protecting the nation's waterways from point and nonpoint sources. In Minnesota, it is administered by the Minnesota Pollution Control Agency (MPCA) under a delegation from the U.S. Environmental Protection Agency. The State Disposal System (SDS) is a state program established under Minn. Stat. § 115. In Minnesota, when both permits are required they are combined into one NPDES/SDS Permit administered by the state. The permits are issued to permittees discharging to a surface water of the state.

Omnidirectional signal: Communication signals transmitted and received by antennae in all directions.

Ozone: An unstable, poisonous allotrope of oxygen, O_3, that is formed naturally in the ozone layer from atmospheric oxygen by electric discharge or exposure to ultraviolet radiation. Also produced in the lower atmosphere by the photochemical reaction of certain pollutants.

PM_{10}: Particulate matter less than 10 microns in aerodynamic diameter

$PM_{2.5}$: Particulate matter less than or equal to 2.5 microns in aerodynamic diameter

Proposed Project: The land and resources located within the proposed routes that were analyzed for the Route Permit Application and EIS.

Project Impact Area: The area within the 130 foot right-of-way where physical ground disturbances are proposed to occur due to construction and/or operation of the Proposed Project.

Species of Special Concern: Although the species is not endangered or threatened, it is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. May include species that were once threatened or endangered but now have increasing or protected, stable populations.

Study Area: The general area surrounding the proposed HVTL routes and substation sites.

Threatened and Endangered Species: A species is considered threatened if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota. A species is considered endangered if the species is threatened with extinction throughout all or a significant portion of its range within Minnesota.

Unidirectional signal: Communication signals transmitted and received by antennae from one direction.

Watershed: A geographic area from which water is drained by a river and its tributaries to a common outlet. A ridge or drainage divide separates a watershed from adjacent watersheds.

Wetlands: Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

.

Executive Summary

The Nashwauk Public Utilities Commission has partnered with Minnesota Power (the Applicants) for the construction of a new high voltage transmission line (HVTL) project, the Essar Steel Transmission Project. The Nashwauk Public Utilities Commission is a municipal utility that provides water, sewer and power to the residents and businesses within the city of Nashwauk. Minnesota Power is an investor owned utility located in Duluth, Minnesota and provides electricity to over 144,000 customers across a 26,000 square mile area in northeastern Minnesota.

REGULATORY FRAMEWORK

The Minnesota Public Utilities Commission (Commission) is responsible for permitting power plants, transmission lines, pipeline, and wind turbine siting. A one year permitting process is required for HVTL lines that are over 200 kV.

Because the Proposed Project is considered an HVTL, it is subject to the Minnesota Power Plant Siting Act (Minnesota Statutes Chapter 216E). This process includes: submittal of a HVTL Route Application, a Public Information/Scoping Meeting, a Scoping Decision for topics to be covered during environmental review, development of an environmental review document, a Public Hearing, and ultimately a permit decision by the Commission.

Applications for HVTL route permits are subject to environmental review, which is conducted by Office of Energy Security (OES) staff under Minnesota Rules, part 7850.1700. OES staff provide notice and conduct public information and scoping meetings to solicit public comments on the scope of the Environmental Impact Statement (EIS). On July 29, 2009, OES staff held a public information meeting at the Taconite Community Center for the EIS scoping process. Written comments were accepted through August 14, 2009. The Director of OES signed and released the Scoping Decision on October 26, 2009. When complete, the Draft EIS is made available to the public prior to the public hearing.

Typically a Certificate of Need is required for construction of large energy facilities in the state of Minnesota. The Essar Steel Transmission Project is considered a large energy facility. The Applicants have stated that the Proposed Project meets the exemption criteria for construction of an HVTL line that serves the demand of a single customer (Essar Steel Minnesota) at a single location (Minnesota Statutes, section 216B.243, subd. 8, item 2).

Nashwauk Public Utilities Commission and Minnesota Power have proposed to build up to 37 miles of new HVTL to supply electrical power to the Essar Steel Minnesota taconite mine and steel plant.

PROJECT DESCRIPTION

The Applicants have proposed to build up to 37 miles of new 230 kilovolt (kV) HVTL to supply power to the new Essar Steel Minnesota Facility (Essar Steel) located in Itasca County near Nashwauk, Minnesota. The Proposed Project includes four new HVTLs, two new substations, and modifications to one existing substation (Figure 1). Once fully operational, Essar Steel will require 300 MW of electricity. The Proposed Project would be constructed solely to supply continuous power to the Essar Steel facility. The estimated cost for the Proposed Project ranges from $74.6 to $78.3 million.

PROJECT ALTERNATIVES AND ANALYSIS

The Applicants have proposed to construct four new HVTLs and two new substations (Figure 1). These new HVTLs would provide power from three existing substations (Shannon, Boswell and Blackberry) as well as establish a connection between two new proposed substations (i.e., Mine substation and Plant substation) that would be constructed for the Proposed Project. The Applicants have identified a preferred and alternate route in the Route Permit Application for each of the four proposed HVTLs. The four preferred HVTL routes have been labeled as Route 1, Route 2, Route 3 and Route 4. The four alternative HVTL routes have been labeled Route 1A, Route 2A, Route 3A, and Route 4A. Additionally, an advisory task force was formed during the EIS scoping process, which identified several additional alternative HVTL alignments for consideration in the EIS.

Route 1 and Route 1A would supply power to Essar Steel from the Shannon substation (Figure 2). Both Route 1 and 1A would begin at the existing 94 Line, which is a 230 kV HVTL running between the Shannon substation and the Boswell substation. Route 2 and Route 2A would provide power to Essar Steel from the Boswell substation (Figure 3). Both Route 2 and Route 2A begin at the existing 94 Line 230 kV HVTL near the Boswell substation. Route 3 and 3A would provide power to Essar Steel from the Blackberry substation located south of the facility (Figure 4). Route 3 and 3A would begin at the Blackberry substation, which would require some modifications to this substation. Routes 4 and 4A would connect the two proposed 230kV substations, the Plant substation and the Mine substation (Figure 5). All of Route 4, part of Route 4A and both of the proposed substations are located on Essar Steel Minnesota property.

A preliminary alignment has been proposed by the Applicants for each preferred and alternate route. Detailed engineering to determine the final alignment for each transmission line would be conducted in the event a Route Permit is granted by the Commission for the Proposed Project.

For the EIS analysis, each preferred route was compared to it corresponding alternative route. For example, Route 1 was compared to Route 1A, and Route 2 was compared to Route 2A. Each route serves a specific purpose for the Proposed Project, and therefore, four routes are required.
Further detail on the proposed routes is provided in chapter 1 of this Draft EIS.

AFFECTED ENVIRONMENT, IMPACTS AND MITIGATION

The Proposed Project is located in a rural area of Itasca County near Nashwauk, Minnesota. In general, the proposed HVTLs would traverse a variety of land use types including, agricultural land, forested areas, mining areas, wetlands, and water resources. There are scattered rural residences throughout the Study Area. However, the proposed HVTLs would not directly cross over residences. There is potentially one residence within the ROW of the HVTL in Route 3. Chapter 5 describes the affected environment of the Proposed Project in greater detail.

Analysis of potential impacts from the Proposed Project and mitigation measures are discussed in chapter 6. The topics analyzed include impacts to human settlement, such as proximity to structures, property values, aesthetics, noise, and public health and safety; impacts to land-based economics, such as agriculture, mining and forestry, transportation, recreation, and archaeological resources; and impacts to the natural environment, such as air quality, water resources, wetlands, flora, fisheries, and wildlife. Potential impacts from the Proposed Project and project alternatives are discussed in detail in chapter 6. A summary of the general potential project related impacts is provided in the text below and in Table EX-1.

Proximity to Structures/Displacement
There are a number of homes within 500 feet of the proposed HVTL in all routes and route alternatives. The Applicants considered the location of homes and businesses when determining the HVTL alignment in order to minimize impacts to existing structures. There are no residences or businesses that would be displaced by the Proposed Project.

Property Values
The potential impact the Proposed Project could have on property values can not be determined with certainty due to the number of factors that may influence a property's value, including location, buyer perception, condition of a property, and the housing market. The Applicants identified residences prior to establishing the proposed HVTL alignments and adjusted centerlines to avoid homes as practical.

Aesthetics
The measure of an aesthetic impact is dependent on the perception or response of the individual viewer. A new visual impact would be introduced in Routes 1, 1A, 2A, 3A, 4, and 4A. Routes 2 and 3 would use an existing transmission line corridor, thus minimizing potential aesthetic impacts. The Applicants have indicated that disturbance to the natural landscape would be minimized; vegetative screening would be used; and uniform H-frame structures would be used for the majority of the proposed HVTL.

Noise
HVTLs can produce audible sound from transmission line conductors, which can generate electromagnetic noise known as corona. The Proposed Project would not exceed MPCA noise standards. Noise is anticipated to be minimal to inaudible beyond the ROW for the proposed HVTL. No houses are located in the ROW, except for one house in the ROW of Route 3. The house along Route 3 could be avoided by following ATF alignment 3-2.

Interference
Communication devices can be affected by an HVTL system through interference of the electromagnetic energy emitted at various frequencies by the communication devices or their antennae. Potential impacts from the Proposed Project could occur to omnidirectional and unidirectional signals in the Study Area, but are expected to be minimal. Some disruption of AM radio and analog television signals may occur but would only likely occur directly below the HVTL. The Applicants would inspect and maintain the HVTL to minimize interference. They would also work with property owners to remedy reception problems if they occur.

Public Health and Safety
There are a number of potential concerns related to health and safety, including electric and magnetic fields (EMF), induction, stray voltage, and potential impacts to implantable medical devices. This EIS discusses these topic areas relative to the Proposed Project. In general, impacts to public health and safety from the Proposed Project are not anticipated. The Applicants would comply with all local, state, and NESC safety standards during design, construction, operation, and maintenance of the proposed HVTLs.

Agriculture
Agricultural land within the Proposed Project was identified for the EIS. Agricultural production would be minimally impacted by the Proposed Project, with a very small amount of land removed from agricultural production. Farming and grazing activities could continue around and under the HVTLs. The Applicants would use previously disturbed areas for construction setup and would work with landowners to minimize impacts to farming operations.

Mining and Forestry
The Proposed Project is located on the Mesabi Iron Range and would be constructed in order to operate a mining facility. Mining and mineral resources were considered during route planning and mining operations or resources would not be adversely impacted by the Proposed Project. The proposed HVTL would cross numerous forest resources. Forested lands would be lost from timber production due to ROW clearing. Impacts to forest resources would be small compared to regional forest resources available.

Zoning and Land Use Compatibility
The Proposed Project would be located in portions of Itasca County and the cities of Nashwauk and Taconite. It is considered a compatible land use under current local government zoning regulations. Zoning or land use variances or special permits would not be required.

Transportation and Public Services
Transportation and utility infrastructure is established in the Study Area. The Proposed Project would not impact local public services such as police, fire or medical. Some temporary road closures during construction may occur, which would require coordination with local emergency services. The Applicants would obtain local and MNDOT permits for all road utility crossings and would work with appropriate parties to ensure public services are not adversely impacted.

Recreation
There are a number of snowmobile trails in the Study Area that would be crossed by the proposed HVTLs. Several of the proposed routes may impact snowmobile trails, but in most cases, impacts would be temporary due to winter construction. Some trails may possibly need realignment for small segments of the trail, depending on final HVTL alignment. The Applicants would work with local snowmobile clubs if realignment of existing trails is required.

Historic and Archaeological Resources
Based on state records, recorded historical resources are outside of the proposed Routes and would not be impacted by the proposed HVTL alignments. Therefore, no adverse impacts to historic or archaeological resources are anticipated. The Applicants would coordinate with SHPO in the event that archaeological resources are discovered during construction.

Air Quality
The Proposed Project has the potential to create limited impacts to air quality through corona effects, leaks of greenhouse gas at the substations, and limited, short-term vehicles emissions and fugitive dust during construction. None of these potential impacts is expected to be significant. Construction would follow best management practices. The disturbed area for each route would be minimized.

Water Resources
There are numerous lakes, rivers, and streams in the Study Area. Stream utility crossings would occur in all proposed routes, comprised of both new stream utility crossings and collocating new transmission lines at existing stream utility crossing. Potential floodzone impacts to the Prairie River would be minimal and isolated to only Route 2. The Proposed Project would not impact groundwater resources. MNDNR permits would be required for work in public waters and utility crossings, and an NPDES permit would also be required for the Proposed Project. Construction BMPs would be used to minimize water quality impacts.

Wetlands
There is an abundance of wetlands in the Study Area, and with each of the preferred and alternative HVTL routes proposed by the Applicants. The proposed HVTLs would span wetlands to the maximum practicable extent to avoid impacts. However, limited impacts would occur to larger impacts that where

transmission line structures would be required to be placed within wetland basins. Additional, vegetation community impacts would occur within forested wetlands due to ROW clearing and maintenance. A permit from Itasca County SWCD and/or the USACE would be required for the Proposed Project.

Flora and Fauna
Vegetation and wildlife habitat would be altered by the Proposed Project. Forested habitat would be lost in each of the proposed routes due to clearing of the ROW. Limited impacts, including loss of habitat, species displacement, and mortality, may occur to local wildlife but would not result in population level impacts. ROW clearing has the potential to result in the spread or introduction of noxious weeds or invasive plant species, which the Applicants would be required to control. Permits from the MNDNR, MPCA, USACE, and Itasca County SWCD would be required for various impacts to natural resources. Construction BMPs would be implemented during construction to minimize habitat impacts.

Rare and Unique Resources/Critical Habitat
The Proposed Project would alter vegetation and wildlife habitat, which has the potential to impact threatened, endangered, and species of special concern through loss of habitat. There are no known threatened or endangered plant or animal species within the proposed HVTL alignments. A species of special concern (i.e., the black sandshell) is known to occur in the Prairie River, but is not anticipated to be adversely impacted by the Proposed Project. The Applicants would be required to conduct surveys to determine the extent of black sandshell populations in the Prairie River if HVTL structures would be placed within the river. If impacts to sensitive mussels could not be avoided, the Applicants would consult the MNDNR on appropriate mitigation measures.

TABLE EX-1: General Summary of Potential Impacts and Mitigation

Topic	Potential Impacts	Mitigation Measures
Effects on Human Settlement		
Proximity to Structures/Displacement	There are homes located within 500 feet of the proposed HVTL for all routes. No displacement would occur from the Proposed Project.	The Applicants identified residences prior to proposing HVTL alignments and adjusted centerlines to avoid displacement. Final ROW alignment and structure locations would maximize the distance of the HVTL from homes as practical.
Property Values	Impacts to property values can not be determined with certainty, but are tied to a number of factors, including condition of the property, housing market, proximity to the HVTL, aesthetics, and buyer's opinion.	Mitigation measures are the same as listed above for proximity to structures.
Aesthetics	A new visual impact would be introduced in Routes 1, 1A, 2A, 3A, 4 and 4A. Routes 2 and 3 would use an existing transmission line corridor.	Minimize natural landscape disturbance, use of uniform H-frame structures, use existing utility or road corridors, and maximize use of existing vegetation for screening as practical.
Noise	The Proposed Project would not exceed MPCA noise standards. Noise is anticipated to be minimal to inaudible beyond the ROW for the proposed HVTL. No houses are located in the ROW of the Proposed Project, except for one house located within the ROW of Route 3.	Equipment would be kept in good working order to minimize potential noise. The house along Route 3 could be avoided by following ATF alignment 3-2.
Interference	Impacts to omnidirectional and unidirectional signals are expected to be minimal from the Proposed Project. Some disruption of AM radio or analog television signals may occur but would only likely occur directly below the HVTL.	The Applicants would inspect and repair the HVTLs to maintain quality reception. Applicants would work to remedy reception problems for property owners if they occur.

Topic	Potential Impacts	Mitigation Measures
Public Health and Safety	Impacts to public health and safety from the Proposed Project are not anticipated. The Applicants would comply with all local, state, and NESC safety standards during design, construction, operation, and maintenance of the proposed HVTLs.	The Applicants would comply with local, state, and NESC standards. Safeguards would be installed to minimize potential health effects.
Effects on Land-based Economics		
Agriculture	Agricultural production would be impacted on a very small scale due to the Proposed Project. The number of acres potentially taken out of agricultural production varies between routes, but ranges between approximately two and thirteen acres per route. Farming and grazing activities could continue around and under the HVTLs.	The Applicants would use previously disturbed areas for construction setup and would work with landowners to minimize impacts to farming operations and agricultural land.
Mining and Forestry	Forested lands would be lost from timber production due to ROW clearing. Acreages lost vary between routes and range from approximately 28 and 150 acres. Impacts would be small compared to regional forest resources available. Mining would not be adversely impacted and the purpose of the Proposed Project is to supply power to the Essar Steel mining facility.	Timber harvested during construction would be made available to landowners. Trees and vegetation would be preserved as practical. Low growing vegetation would be allowed to re-establish after construction. Mining and mineral resources were considered during route planning. Applicants would work with existing and future mine operators to limit impacts to mining operations and develop mitigation measure if necessary.
Zoning and Land Use Compatibility	The proposed HVTLs are a compatible use with Itasca County and city of Nashwauk zoning ordinances. Zoning or land use variances or special permits would not be required.	No mitigation proposed.
Transportation and Public Services	The Proposed Project would not impact local public services such as police, fire or medical. Some temporary road closures during construction may require coordination with local emergency services. Traffic patterns may experience temporary disruption during construction but would not be permanently altered. Railroad and airport traffic and use would not be	The Applicants would obtain local and MNDOT permits for all road utility crossings and would work with appropriate parties to ensure public services are adversely

Topic	Potential Impacts	Mitigation Measures
	disrupted.	impacted.
Recreation	Several of the proposed routes may impact snowmobile trails. In most cases, the impacts would be temporary in the event of winter construction. In Routes 2, 2A, 3, and 3A, minor trail realignments may be necessary to accommodate the HVTL alignment.	The Applicants would work with local snowmobile clubs if realignment of existing trails is required.
Historic and Archaeological Resources	There are no recorded historic or archaeological sites within or in close proximity to the proposed routes or ATF alignments. No adverse impacts to historic or archaeological sites are anticipated.	The Applicants would investigate the potential presence of native burial mounds near Little Sucker Lake. The Applicants would coordinate with SHPO in the event that archaeological resources are discovered during HVTL construction.
Effects on the Natural Environment		
Air Quality	Temporary fugitive dust impacts would occur during construction but are expected to be minor. Construction and operation of the HVTL would not be a significant source of air emissions.	Construction activities would follow best management practices. Petroleum based dust suppressants would not be used. Construction vehicles with excess tailpipe emissions would not be operated until repairs could be made. The disturbed area for each route would be minimized.
Water Resources	Stream utility crossings are likely in all of the proposed routes. Some of these stream crossing would be new, while other proposed routes would be collocated with existing utility crossings. One lake utility crossing would occur in Route 3, but it would be along an existing utility crossing. No other routes would have lake crossings. The Proposed Project would not impact groundwater resources. Impacts to the Prairie River floodzone in Route 2 would be minimal. No other floodzones impacts are anticipated.	MNDNR permits would be required for public water utility crossings. An NPDES construction permit would also be required. This permit requires a SWPPP and the use of BMPs, which would be implemented during construction to minimize water quality impacts.
Wetlands	There are wetlands located within each of the proposed HVTL routes. The proposed HVTL would span wetlands to the maximum practicable extent to avoid impacts. Portions of larger wetlands that could not be spanned by the	Wetland impacts for the Proposed Project would require a permit from Itasca County SWCD and/or

Topic	Potential Impacts	Mitigation Measures
	HVTL would be impacted during construction and pole placement of the proposed HVTL. Vegetation community impacts would occur within forested wetlands due to ROW clearing and maintenance.	the USACE. A mitigation plan would be required to offset impacts to wetlands basins or vegetation.
Flora and Fauna	Forested habitat would be lost in each of the proposed routes due to clearing of the ROW for the Proposed Project. Impacts, including loss of habitat, species displacement, and mortality, may occur to local wildlife but would not result in population level impacts. ROW clearing has the potential to result in the spread or introduction of noxious weeds or invasive plant species.	Permits from the MNDNR, MPCA, USACE, and Itasca County SWCD would be required for various impacts to natural resources. BMPs would be implemented during construction to minimize habitat impacts, as required by the permits.
Rare and Unique Resources/Critical Habitat	There are no known threatened or endangered plant or animal species within the proposed HVTL alignments. A species of special concern (i.e., the black sandshell) is known to occur in the Prairie River.	The Applicants would be required to conduct surveys to determine the extent of black sandshell populations in the Prairie River if HVTL structures would be placed within the river. If impacts to sensitive mussels could not be avoided, the Applicants would consult the MNDNR on appropriate mitigation measures.

1.0 Introduction

This chapter of the Draft EIS provides an overview of the Proposed Project. A project description and location of where each of the project facilities would be constructed is provided. This chapter explains the purpose and need for the Proposed Project and why it is necessary for the operation of the Essar Steel project. The Proposed Project includes four proposed routes and alternatives for each of those routes. The routes and alternatives, including route width and right-of-way are described in this chapter, along with descriptions for each of the proposed substations. A discussion of project schedule and estimated project cost is also provided.

1.1 DRAFT EIS DOCUMENT LAYOUT

This Draft EIS includes an analysis of the potential for significant environmental effects from various aspects of the Proposed Project. Proposed transmission line projects require multiple levels of environmental review and analysis. Analysis contained within an EIS for a proposed transmission line project includes the potential environmental impacts that would result from a proposed action along a proposed route, as well as examination of the potential impacts associated with each alternative route. This Draft EIS contains the environmental review components required for an EIS examining the potential impacts of a high voltage transmission line and associated substations.

This Draft EIS document consists of a summary and nine chapters, as well as tables, figures and appendices. The information provided in each chapter of this Draft EIS includes:

- Chapter 1 – Introduction provides an introduction to the Proposed Project including description, location, purpose and alternatives.
- Chapter 2 – Regulatory Framework describes Minnesota Rules and requirements governing the various levels of environmental review and permitting required for the Proposed Project.
- Chapter 3 – Engineering and Operational Design details the process of completing the final engineering and design for the proposed HVTL in the event that a Route Permit is granted for the Proposed Project.
- Chapter 4 – Construction and Right-of-Way Acquisition describes the activities associated with right-of-way acquisition and construction for the proposed HVTL.
- Chapter 5 –.Affected Environment provides a detailed description of the environmental setting for the Study Area containing the Proposed Project. It also describes the existing conditions of topics related to socioeconomics, land-based economics and the natural environment within each preferred and alternative route. Topics addressed include: proximity to structures; human health; property values; noise; aesthetics; public health and safety; agriculture; mining; forestry; zoning and land use; transportation; public services; recreation; historic resources; air quality; water resources; wetlands; flora and fauna; and rare and unique natural resources.
- Chapter 6 – Environmental Impacts and Mitigation includes specific detailed analysis of the potential impacts of the proposed HVTL within the Project Impact Area (i.e., the right-of-way established for each HVTL alignment). The potential impacts related to all preferred and alternative routes, as well as suggested alignment shifts are discussed. Additionally, recommendations of necessary or suggested levels of mitigation to offset project impacts are provided.
- Chapter 7 – Summary of Unavoidable Impacts provides an analysis of the unavoidable impacts and commitment of resources that would be associated with the Proposed Project.

- Chapter 8 – Permits and Approvals has a detailed listing and description of the permits and approvals that would be required to construct and operate the Proposed Project.
- Chapter 9 – References includes a list of references used during data collection, analysis and writing of the EIS document.

In summary, chapters 1 and 2 of this Draft EIS provide the introduction to the Proposed Project and the regulatory framework governing environmental review and permitting for the project. Chapters 3 and 4 of this Draft EIS describe the procedures for completing final design, engineering and construction of the proposed HVTL. Chapter 5 provides a detailed description of the existing environment within the Study Area and the proposed routes. Chapter 6 provides specific detailed analysis of the potential impacts from the Proposed Project including all preferred routes, alternative routes, alignment shifts and substations. Chapter 7 provides a summary of the significant and unavoidable impacts that would potentially result from the Proposed Project. Chapter 8 details the permits and approvals that would be required by the Proposed Project, while chapter 9 includes references used throughout the document.

1.2 PROJECT DESCRIPTION AND LOCATION

The Nashwauk Public Utilities Commission has partnered with Minnesota Power (the Applicants) for the construction of a new high voltage transmission line (HVTL) project. The Nashwauk Public Utilities Commission is a municipal utility that provides water, sewer and power to the residents and businesses within the city of Nashwauk. Minnesota Power, a division of ALLETE Inc., is an investor owned utility located in Duluth. Minnesota Power provides electricity to over 144,000 customers across a 26,000 square mile area in northeastern Minnesota. The distribution system operated by Minnesota Power includes more than 8,800 miles of transmission lines and 169 substations.

The Applicants have proposed to build up to 37 miles of new 230 kilovolt (kV) HVTL to supply power to the new Essar Steel Minnesota Facility (Essar Steel) located in Itasca County near Nashwauk, Minnesota. In order to provide a continuous source of reliable electrical power to Essar Steel, the Proposed Project includes four new HVTLs and two new substations (Figure 1).

> Nashwauk Public Utilities Commission and Minnesota Power have proposed to build up to 37 miles of new HVTL to supply electrical power to the Essar Steel Minnesota taconite mine and steel plant.

The Essar Steel project includes the reactivation of the idle Butler taconite mine and the construction of a new direct reduction steel plant. It will be the first facility in North America to include ore mining, ore processing, direction reduction and steel making on a single site (www.essar.com/steel/plants_overseas_Minnesota.htm). The Essar Steel project completed the environmental review process in 2007, which included a full Environmental Impact Statement (EIS). The Essar Steel project has received permits to proceed with construction of the new facility from the state of Minnesota.

The Essar Steel project will be constructed in three phases, which will result in an increase in the electrical power needs for the project. The Essar Steel project is estimated to require up to 300 Megawatts (MW) of power by the first quarter of 2014 for operation of the taconite mine, direct reduced iron facility, and steel slab plant and melt line. In the event that a second steel slab melt line is constructed at the facility, an additional 200 MW of power would be required for a total power need of approximately 500 MW at Essar Steel.

The Essar Steel operation can be divided into two main facilities, the taconite mine and the steel plant. Upon startup, each facility will operate continuously, 24 hours a day, and therefore need a continuous supply of power. In order to ensure that a continuous, uninterrupted supply of power is available for the Essar Steel operation, the Proposed Project would construct four new HVTLs, two new substations and modify an existing substation to satisfy power needs at the facility (Figure1).

Electricity from three regional, existing substations: the Shannon substation, the Boswell substation and the Blackberry substation, would serve to feed electricity to the Proposed Project. A new HVTL would be constructed to bring power to Essar Steel from each of the existing substations. Additionally, a new substation would be constructed at both the taconite mine and the steel plant on the Essar Steel property. These new substations would be connected by a fourth new HVTL.

The rationale for the four new HVTLs and new substations is to provide adequate electricity and transmission system redundancy, in the event that one of the new transmission lines or existing substations (Shannon, Boswell or Blackberry) were to temporarily go out of service. Construction of four transmission lines, which would supply more electricity than what is needed for daily facility operations, would ensure continuous operation of Essar Steel. As long as one of the three new HVTLs is in operation and the two new substations on Essar Steel property are connected by a new HVTL, the Applicants can ensure that a continuously supply of power would be provided to Essar Steel. For example, if the Shannon substation were to go out of service, power could be supplied to Essar Steel from the Boswell or Blackberry substations via the proposed HVTLs.

1.3 PURPOSE AND NEED

The purpose of the Proposed Project is to provide a continuous source of reliable electrical power to a single facility, the Essar Steel taconite mine and steel plant. Once operational, Essar Steel will require 300 MW of electricity. Additional modifications and upgrades allowed under the permit for the Essar Steel facility could increase the power need for the facility by an additional 200 MW.

The need for the Proposed Project would normally be established through the Certificate of Need (CON) process; however, the Applicants have filed for an exemption to the CON rules that govern the construction of new HVTLs. The CON process and the exemption requested by the Applicants are discussed in section 2.2 of this Draft EIS.

1.4 ROUTE DESCRIPTIONS

In order to provide a continuous source of reliable electrical power to Essar Steel, the Applicants have proposed to construct four new HVTLs and two new substations (Figure 1). These new HVTLs would provide power from three existing substations (Shannon, Boswell and Blackberry) as well as establish a connection between two new proposed substations (i.e., mine substation and plant substation) that would be constructed under the Proposed Project. The Applicants have identified a preferred and alternate route in the Route Permit Application for each of the four proposed HVTLs. The four preferred HVTL routes have been labeled as Route 1, Route 2, Route 3 and Route 4. The four alternative HVTL routes have been labeled Route 1A, Route 2A, Route 3A, and Route 4A. A description of each route and route alternative is provided.

Route 1 and 1A

Route 1 and Route 1A would supply power to Essar Steel from the Shannon substation (Figure 2). Both Route 1 and 1A would begin at the existing 94 Line, which is a 230 kV HVTL running between the Shannon substation and the Boswell substation. Route 1 would tap into the Shannon end of the 94 Line approximately 0.75 miles west of Trunk Highway (TH) 65. It would then travel south for 7.5 miles where it would terminate at the proposed Essar Steel Plant substation. Route 1 would cross sections 24, 25 and 36 in Township 58N, Range 23W and sections 1, 12, 13, 24 and 25 in Township 57N, Range 23W. A preliminary alignment has been proposed within Route 1, which has a total length of 7.5 miles. Route 1, as defined by the Applicants, is 3,000 feet wide, which allows for shifting of the alignment within Route 1 to avoid impacts to residences or sensitive resources.

Route 1A would also tap into the Shannon end of the 94 Line, approximately one mile east of State Highway 65. Route 1A travels south for approximately 5.5 miles, until approximately 0.25 miles north of Little Sweden Road. Route 1A then travels west for approximately 1.6 miles before turning south for 1.6 miles and southeast for an additional 0.65 miles where it terminates at the proposed Essar Steel Plant substation. Route 1A would travel through sections 19, 20, 29, 30, 31, and 32 of Township 58N, Range 22W; through sections 5, 6, 7, 8, 17, 18, 19, and 20 of Township 57N, Range 22W; and through sections 13, 24 and 25 of Township 57N, Range 23W.

The total length of Route 1A is 9.3 miles, and the width defined by the Applicants varies between 1,500 and 3,000 feet, depending on the proximity to existing roads. The preliminary alignment defined within Route 1A could be shifted within the route as needed to minimize potential impacts to existing resources.

Route 2 and 2A

Route 2 and Route 2A would provide power to Essar Steel from the Boswell substation (Figure 3). Both Route 2 and Route 2A begin at the existing 94 Line 230 kV HVTL near the Boswell substation.

Route 2 would tap into the 94 Line approximately one mile south of where the 94 Line crosses County State Aid Highway (CSAH) 60. It would travel south for 1.6 miles to the existing 115 kV 28 Line. Route 2 then travels east for 8.4 miles following the 28 Line. Finally, it would travel 0.75 miles northeast and east where it would terminate at the Essar Steel Mine substation. Route 2 would cross sections 31 of Township 57N, Range 24W; sections 1, 2, 3, 4, 5, and 6 of Township 56N, Range 24W; and sections 3, 4, 5 and 6 of Township 56N, Range 23W. The total length of Route 2 would be 10.75 miles. The majority of Route 2 is 500 feet wide where the route follows the right-of-way (ROW) of existing transmission lines. In the remaining areas where new ROW would be acquired, Route 2 would be 1,500 feet wide to allow for flexibility in finalizing the HVTL alignment within the route.

Route 2A would tap into the Boswell substation end of the 94 Line, where the 94 Line crosses CSAH 60. The route travels on a path to the east, south and northeast for a distance of approximately 1.5 miles. Route 2A then travels south for 1.25 miles and then south and east for an additional 0.9 miles. It again turns east for a distance of 4.5 miles until it reaches a point just west of Big Sucker Lake. At that point the route turns 1.5 miles to the southeast, where it terminates at the Essar Steel Mine substation. Route 2A would travel trough sections 31, 32, 33, 34, 35, and 36 of Township 57N, Range 24W and through sections 31, 32 and 33 of Township 57M, Range 23W. The total length of Route 2A would be approximately 9.7 miles. Route 2A would require new ROW for the entire length of the route. As a result, proposed Route 2A varies from 1,500 to 3,000 feet wide to allow flexibility in determining the final HVTL alignment.

Route 3 and 3A

Route 3 and 3A would provide power to Essar Steel from the Blackberry substation located south of the facility (Figure 4). Route 3 and 3A would begin at the Blackberry substation, which would require some modifications to this substation.

Route 3 would travel northeast from the Blackberry substation following the existing Minnesota Power 115 kV 63 Line for 11.4 miles. Route 3 then travels northwest for 1.9 miles and west for an additional 1.1 miles where it terminates at the Essar Steel Plant substation. Route 3 travels through sections 3, 4, 8, 9, 17, 18 and 19 of Township 55N, Range 23 W; through sections 6, 7, 12, 13, 23, 24, 26, 27, 34 and 35 of Township 56N, Range 22W; through section 31 of Township 57N, Range 22W; and through sections 25 and 36 of Township 57N, Range 23W. The total length of Route 3 as identified by the Applicants is 14.4 miles. The proposed route width is 500 feet in all areas where it follows existing transmission line ROW and 3,500 feet in areas where new ROW would be required.

Route 3A would also begin at the Blackberry substation and then travel west along the existing Minnesota Power 115 kV 20 Line for 1.75 miles. Route 3A would then travel north for one mile to an existing natural gas pipeline ROW, where it would follow the pipeline for 0.8 miles northeast. It then travels 1.35 miles to the north and northeast, turns north for an additional 1.4 miles and then northwest for 1.65 miles to the location of the former Greenway 115kV substation. For 2.8 miles north, the route would follow the Minnesota Power 115 kV 28 Line ROW and then east for 4.1 miles along the 28 Line ROW. Route 3A then travels east for 0.75 miles to bypass the Essar Steel Mine substation and travels 2.8 miles east until the route terminates at the Essar Steel Plant substation. Route 3A crosses sections 1, 12, 13, 14, 23 and 24 of Township 55N, Range 24W; sections 1, 2, 11, 14, 23, 25, 26 and 36 of Township 56 N, Range 24W; sections 2, 3, 4, 5 and 6 of Township 56N, Range 23W; and sections 25, 26, 34, 35 and 36 of Township 57N, Range 23W. The total length of Route 3A is 18.4 miles. The width of Route 3A as proposed by the Applicants varies from 500 feet where existing transmission line ROWs are followed; 3,000 feet where existing roads are followed; and 1,500 feet in all other areas.

Route 4 and 4A

The purpose of Routes 4 and 4A is to connect the two proposed substations on Essar Steel Minnesota property, the Mine substation and the Plant substation. This would provide an additional route for power in the event that the main HVTL to either substation was damaged or out of service. Route 4 is located entirely on Essar Steel Minnesota property. The majority of Route 4A is on Essar Steel Minnesota property, however a portion of the proposed route would cross private property between Big Sucker and Little Sucker Lakes (Figure 5).

Route 4 would begin at the Essar Mine substation and then travel northeast for approximately 2.5 miles and then east for 0.35 miles where it would terminate at the Essar Steel Plant substation. Route 4 crosses sections 2 and 3 of Township 56N, Range 23W and sections 25, 26, 34, 35 and 36 of Township 57N, Range 23W. The total length of Route 4 is 2.85 miles and has a proposed width of 3,000 feet.

Route 4A also begins at the Essar Mine substation and travels northeast for two miles between Big Sucker Lake and Little Sucker Lake. The route then travels north for 1.1 miles to the Essar Steel Plant substation. Route 4A travels through section 3 of Township 56N, Range 23 W. The total length of Route 4A is 3.1 miles and has a proposed width 3,000 feet, with the exception of near Big and Little Sucker Lakes where the width of the route is reduced to avoid the lakes.

1.5 SUBSTATION DESCRIPTIONS

The Proposed Project includes the construction of two new 230 kV substations on the Essar Steel Minnesota property, the Essar Steel Plant substation and the Mine substation. Additionally, modifications to the existing Blackberry 230 kV substation would be required to accommodate the connection of the Route 3/3A HVTL. The Essar Steel Mine substation would be located on 1.4 acres of land, and the Essar Steel Plant substation would be located on 4.5 acres of land (Figure 5).

The Essar Steel Mine substation would be constructed with the appropriate connections for the HVTLs from Route 2/2A and Route 4/4A, as well as the necessary infrastructure to support the power needs of the Essar Steel taconite mine. The Essar Steel Plant substation would be constructed with the appropriate connections for the HVTLs from Route 1/1A, Route 3/3A and Route 4/4A along with the necessary infrastructure to support the power needs of the Essar Steel slab plant. Detailed descriptions of the substation infrastructure are provided in chapter 3 of the Route Permit Application.

1.6 ROUTE WIDTH

The Route Permit Application states that the width of the proposed HVTLs range from as narrow as 500 feet to as wide as 3,500 feet. Table 1-1 summarizes the general route width for each route.

Table 1-1: Route Corridor Widths for Determining Final Alignment (in feet)

Route	Width along existing roadways	Width along existing transmission lines	Width in new rights-of-way
1	3,000	NA	3,000
1A	3,000	NA	1,500
2	NA	500	1,500
2A	3,000	NA	1,500
3	NA	500	3,500
3A	3,000	500	1,500
4	NA	NA	3,000
4A	3,000	NA	3,000

Source: Route Permit Application

In general, narrow route widths (i.e., 500 ft) are associated with proposed routes that utilize existing ROWs along utility corridors. For these areas the new transmission lines would be located within the existing ROWs and as a result, a narrower width is used to determine the final transmission line alignments and analyze potential environmental impacts associated with the Proposed Project.

In areas where new easements and ROWs would be required to construct the proposed HVTLs, the route widths vary from 1,500 to 3,500 feet. Wider routes allow flexibility in determining the final alignment for the proposed HVTL, allowing for placement of the transmission line that avoids potential impacts to residences or sensitive resources for example. A preliminary alignment has been proposed by the Applicants for each preferred and alternate route. Detailed engineering to determine the final alignment for each transmission line would be conducted in the event that a Route Permit is granted for the Proposed Project by the Commission.

1.7 RIGHTS-OF-WAY

The Applicants have proposed that a 130 foot wide ROW would be required to construct the new transmission lines. This ROW width equates to 65 feet from the centerline of the proposed HVTL. The Commission encourages use of existing ROW when considering new HVTL projects. The Applicants have attempted to utilize ROWs associated with existing transmission lines, pipelines and roadways where possible for the proposed HVTL routes. ROW sharing for each of the proposed routes is discussed in detail in chapter 6 of this Draft EIS.

Currently the Applicants have not secured easements to acquire ROW for the proposed HVTLs. In the event that a Route Permit is granted by the Commission for the Proposed Project, the Applicants would begin the process of acquiring easements for construction, and operation and maintenance of the HVTLs. Additionally, ROW agents designated by the Applicants would survey the properties along each route, assess the property and easement values, and begin negotiating with landowners to acquire ROW.

1.8 SCHEDULE

Given the purpose of the Proposed Project to provide power to Essar Steel, the schedule for the Proposed Project is tied to the construction and operation schedule of the Essar Steel project. The first phase of the Essar Steel project, which includes the taconite mine, is scheduled to be operational by spring 2011. If a Route Permit is granted for the Proposed Project, ROW acquisition would begin during the fall 2010. The first phase of the Proposed Project, which includes the construction of the Route 2/2A HVTL (aka the Boswell Line), the Route 4/4A HVTL and the Essar Steel Plant and Mine substations, is scheduled to be completed by April 2011.

The additional phases of the Essar Steel project include completion of the direct iron reduction facility by the first quarter of 2013 and completion of the steel slab plant melt line by the first quarter of 2014. The additional phases of the Proposed Project, including completion of the Route 1/1A and Route 3/3A HVTLs and the modifications to the Blackberry substation, would be completed along a timeline that ensures the power needs for the additional phases of the Essar Steel project are met.

1.9 PROJECT COST

The estimated cost for the Proposed Project ranges from $74.6 to $78.3 million. This includes the construction of all four HVTLs using H-frame wooden poles, construction of the two new substations and modifications to the Blackberry substation.

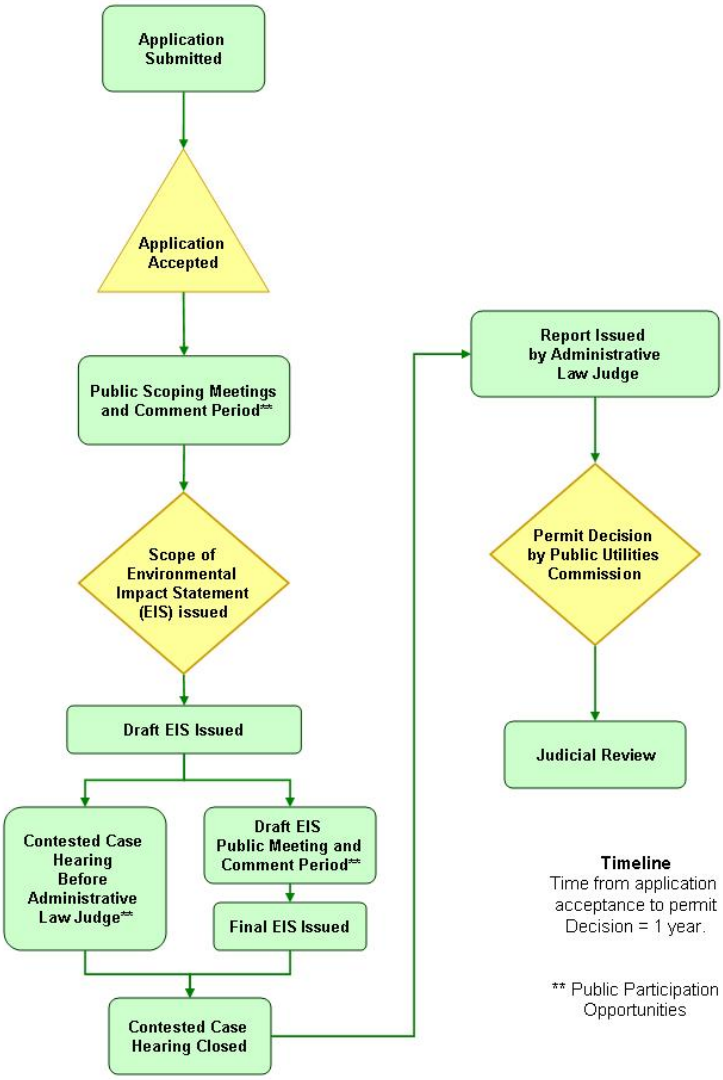
The cost for the Proposed Project is dependant on the final routes selected, which influences the length of each transmission line and thus the cost for materials, construction, and ROW acquisition. The estimated cost to construct the proposed HVTL ranges from a low of $28.3 million (if all four preferred routes were selected) to a high of $32 million (if all four alternate routes were selected). The materials used for construction of the new transmission line could also influence the final project cost. The cost for transmission line materials and construction listed above include using wooden H-frame poles proposed by the Applicants for all four HVTL routes. If single pole steel structures were required for different portions of the four routes, the cost for the new transmission lines could increase significantly.

The Proposed Project also includes the construction of two new substations and requires upgrades at an existing substation. The Applicants have estimated that the cost for the new Essar Steel Mine substation is $13.8 million, and the cost for the new Essar Steel Plant substation is $31.4 million. The Applicants have further estimated that upgrades to the Blackberry substation associated with the Proposed Project cost $1.1 million. The total estimated cost for the Proposed Project ranges from $74.6 million to $78.3 million. This cost estimate includes construction and ROW acquisition of four new transmission lines that would all use H-frame wooden poles, construction of two new substations, and modifications to the existing Blackberry substation.

2.0 Regulatory Process

The Minnesota Public Utilities Commission (Commission) is responsible for regulating electricity, natural gas and telephone services in Minnesota, with the mission of ensuring that safe, reliable and efficient utility services are provided. The Commission is the agency responsible for reviewing and permitting new transmission line projects. The Department of Commerce (DOC) – Office of Energy Security (OES) works with the Commission during the permit review process. The OES participates in Commission proceedings by providing analysis and making recommendations to the Commission, who has decision making authority on utility permitting. This section of the Draft EIS describes the permit review process required for the construction of new high voltage transmission lines (HVTLs) in the state of Minnesota.

Illustration 2-1: Commission Permitting Process



Minnesota Statutes, section 216E.03, subd. 2, provides that no person may construct a high voltage transmission line without a route permit from the Commission. As defined in Minnesota Statutes, section 216E.01, subd. 4, an HVTL is 100 kV or more and greater than 1,500 feet in length. The four 230 kV transmission lines proposed for the Essar Steel Transmission Project are HVTLs, and therefore a Route Permit is required prior to construction.

Because the Proposed Project is considered an HVTL, it is subject to the Minnesota Power Plant Siting Act (Minnesota Statutes Chapter 216E).

This process includes: submittal of a HVTL Route Application, a Public Information/Scoping Meeting, a Scoping Decision, development of an environmental review document, a Public Hearing, and ultimately a permit decision by the Commission.

2.1 POWER PLANT SITING ACT – MINNESOTA RULE 7850

Minnesota Rules Chapter 7850 implements and regulates the Power Plant Siting Act. The intent of the Act and Chapter 7850 is to ensure that HVTLs are routed in an orderly manner compatible with environmental preservation and the efficient use of resources. In accordance with this policy, the Commission must choose locations that minimize adverse human and environmental impacts, while ensuring electric

power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion. The Commission is also required to provide for broad spectrum citizen participation in conjunction with these rules.

2.1.1 Route Permit Application

The Essar Steel Transmission Project HVTL Route Permit Application was submitted on June 1, 2009 pursuant to the provisions of the Full Permitting Process outlined in Minnesota Rules, parts 7850.1700 to 7850.2700. In accordance with Minnesota Rules, part 7850.1900**,** subp. 2, an application for a Route Permit for an HVTL must contain the following information:

- A statement of proposed ownership of the facility at the time of filing the application and after commercial operation;
- The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated;
- At least two proposed routes for the proposed HVTL and identification of the applicant's preferred route and the reasons for the preference;
- A description of the proposed HVTL and all associated facilities including the size and type of HVTL;
- Environmental information (see section 2.1.2 below);
- Identification of land uses and environmental conditions along the proposed routes;
- The names of each owner whose property is within any of the proposed routes for the HVTL;
- U.S. Geological Survey (USGS) topographical maps or other maps acceptable to the state authority showing the entire length of the HVTL on all proposed routes;
- Identification of existing utility and public rights-of-way (ROWs) along or parallel to the proposed routes that have the potential to share the ROW with the proposed line;
- The engineering and operational design concepts for the proposed HVTL, including information on the electric and magnetic fields of the transmission line;
- The cost analysis of each route, including the costs of constructing, operating, and maintaining the HVTL that are dependent on design and route;
- A description of possible design options to accommodate expansion of the HVTL in the future;
- The procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the HVTL;
- A listing and brief description of federal, state, and local permits that may be required for the proposed HVTL; and
- A copy of the Certificate of Need or the certified HVTL list containing the proposed HVTL or documentation that an application for a Certificate of Need has been submitted or is not required.

The Commission accepted the Essar Steel Transmission Project HVTL Route Permit Application as complete on June 29, 2009.

2.1.2 Environmental Information

A Route Permit Application shall include the following environmental information for each proposed site or route to aid in the preparation of an EIS:

- Environmental setting for each site or route;
- Effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services;
- Effects of the facility on land-based economics, including, but not limited to, agriculture, forestry, tourism, and mining;

- Effects of the facility on archaeological and historic resources;
- Effects of the facility on the natural environment, including effects on air and water quality resources, and flora and fauna;
- Effects of the facility on rare and unique natural resources;
- Identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route; and
- Measures that might be implemented to mitigate the potential human and environmental impacts and the estimated costs of such mitigation measures.

2.1.3 Environmental Review

Applications for HVTL route permits are subject to environmental review, which is conducted by OES staff under Minnesota Rules, part 7850.1700. OES staff provide notice and conduct public information and scoping meetings to solicit public comments on the scope of the EIS.

On Wednesday, July 29, 2009, OES Energy Facility Permitting staff (EFP) held a public information meeting at the Taconite Community Center. The meeting started at 6:00 pm. The purpose of the meeting was to provide information to the public about the Proposed Project, answer questions, and allow the public an opportunity to suggest alternatives and impacts that should be considered during preparation of the environmental review document. Written comments were due no later than Friday, August 14, 2009.

Approximately 65 people attended the public information and scoping meeting; fourteen individuals took the opportunity to speak on the record. A court reporter was present to document oral statements. Fifteen written comments were received.

> The major areas of concern expressed during the public comment period included: compatibility land use plans; health and safety issues; Proposed Project cost and who pays; and easement acquisition and compensation.

The major areas of concern expressed during the public comment period included: compatibility with existing and future land use plans (including farming and mining); health and safety issues; cost of the Proposed Project and who pays; and questions concerning easement acquisition (including buy the farm provisions).

The order issued by the Commission accepting the Route Permit Application as complete authorized the OES to establish an Advisory Task Force (ATF) as allowed under Minnesota Rules, part 7850.2400. The purpose of the ATF was to assist the OES staff in developing the scope of the EIS and in determining specific impacts and issues of local concern that should be addressed in the EIS. The ATF held three meetings (August 12, September 2, and September 23, 2009) to discuss and analyze issues related to the Proposed Project. The ATF produced a final report (Appendix B) on October 20, 2009 detailing the findings of their analysis. The ATF identified three additional alternative route segments and five additional alternative alignment segments that were recommended to be carried forward and analyzed in the Draft EIS.

The Director of OES determines the scope of the EIS. The OES shall not consider whether or not the Proposed Project is needed (Minnesota Statute, section 216E.03, subd. 5), nor shall the issues of size, type and timing, system configuration, and voltage be included in the scope of environmental review (Minnesota Statute, section 216E.02, subd. 2).

The Director signed and released the Scoping Decision (Appendix A) on October 26, 2009.

An EIS is a written document that describes the human and environmental impacts of a proposed project (and selected alternative routes) and methods to mitigate such impacts. The public has the opportunity to comment on the Draft EIS through public comment periods and at OES sponsored information meetings.

The Draft EIS will be completed and made available prior to the public hearing.

2.1.4 Public Hearing

Applications for HVTL route permits under the full permitting process require a public contested case hearing upon completion of the Draft EIS pursuant to Minnesota Rules, part 7850.2600. The hearing must be conducted by an administrative law judge from the Office of Administrative Hearings (OAH) pursuant to the contested case procedures of Minnesota Statute Chapter 14. A portion of the hearing must be held in a county where the proposed project would be located. The administrative law judge assigned to this docket (OAH Docket 8-2500-20664-2) is the honorable Judge Eric L. Lipman. The tentative date for the start of the contested case hearing is April 7, 2010.

2.1.5 Final Decision

In determining whether to issue a permit for an HVTL, the Commission shall consider the following factors:

- Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services;
- Effects on public health and safety;
- Effects on land-based economics, including, but not limited to, agriculture, forestry, tourism, and mining;
- Effects on archaeological and historic resources;
- Effects on the natural environment, including air and water quality resources and flora and fauna;
- Effects on rare and unique natural resources;
- Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;
- Use or paralleling of existing ROWs, survey lines, natural division lines, and agricultural field boundaries;
- Use of existing transportation, pipeline, and electrical transmission systems or ROWs;
- Electrical system reliability;
- Costs of constructing, operating, and maintaining the facility that are dependent on design and route;
- Adverse human and natural environmental effects which cannot be avoided; and
- Irreversible and irretrievable commitments of resources.

A large energy facility is defined as "any transmission line with a capacity of 200 kV or more and greater than 1,500 feet in length."

An example of a completed Route Permit is provided in Appendix C.

2.2 CERTIFICATE OF NEED PROCESS

The Certificate of Need process is described under Minnesota Statutes, section 216B.243. The statutes state that "no large energy facility shall be cited or constructed in Minnesota without the issuance of a certificate of need by the commission." The Essar Steel Transmission Project consists of the construction of four new 230 kV HVTLs totaling up to 37 miles in combined length and two new substations, which qualifies it as a large energy facility under Minnesota Statutes, section 216B.2421, subd. 2.

Exemptions: an HVTL proposed primarily to distribute electricity to serve the demand of a single customer at a single location, unless the applicant opts to request that the Commission determine need under Minnesota Statutes, section 216B.243 or section 216B.2425.

The Applicants have stated that the Proposed Project meets the exemption criteria for construction of an HVTL line that serves the demand of a single customer at a single location (Minnesota Statutes, section

216B.243, subd. 8, item 2). The single customer for this Proposed Project would be Essar Steel Minnesota (ESM). All four proposed 230 kV transmission lines would terminate at the two proposed 230 kV substations located at the ESM site.

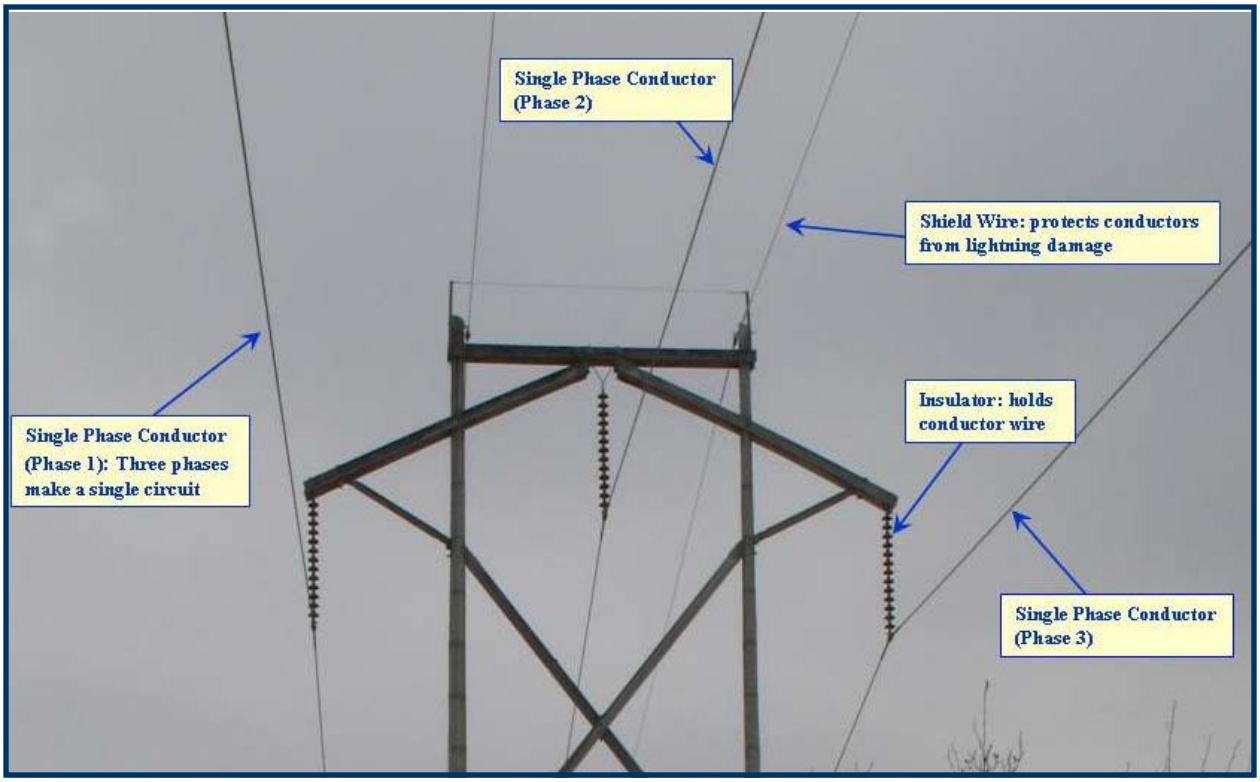
3.0 Engineering and Operational Design

This chapter provides information on the engineering and design of the proposed HVTL structure, transmission line conductors, and substation components. Design options for future expansion and an underground system are also discussed. The proposed overhead HVTL system would utilize existing and new ROW. These ROW requirements are also described for each route.

3.1 HVTL SYSTEM COMPONENT DESIGN

There are several main components to the four proposed 230 kV HVTLs. Typical HVTLs consist of three phases, each at the end of a separate insulator, supported by a physical structure. Illustration 3-1 depicts the components of a single circuit HVTL on an H-frame structure. A phase consists of one or more conductors (single, double, or bundled) made up of aluminum strands around a core of steel. To prevent damage from lightning strikes, shield wires are typically strung between structures above the phases. Substations are required as part of the system to reduce voltage since the voltage required for transmission exceeds acceptable distribution loads.

Illustration 3-1: Single Circuit HVTL Consisting of Three Phases and Shield Wires



The Applicants prefer route alternatives do not place two or more of the proposed 230 kV transmission lines on the same structure (double-circuiting) or within a common ROW. Studies show that a simultaneous outage in two of the three lines supplying power to Essar Steel would result in power outages at the plant. The probability of a single event leading to simultaneous outages increases if two of the proposed 230 kV lines were double-circuited or share a ROW.

There are a number of segments along the proposed routes which follow existing 115 kV lines for a portion of the total route length. Where existing homes, buildings, or other physical facilities would constrain the ROW, there is potential for double-circuiting the existing 115 kV line with the proposed 230 kV line. The Applicants may utilize double-circuiting in such areas in the final HVTL design.

Design information for the system components discussed above has been provided by the Applicants and is detailed in the sections below. However, final engineering and design for the Proposed Project has not been completed, and components are subject to change pending additional electrical optimization studies. Final engineering and design would be completed if the Proposed Project is granted a Route Permit from the Commission. The final design would comply with all conditions detailed in the Route Permit as well as all other applicable federal, state or local permits, and rules and regulations governing the Proposed Project.

3.2 TRANSMISSION LINE CONDUCTORS

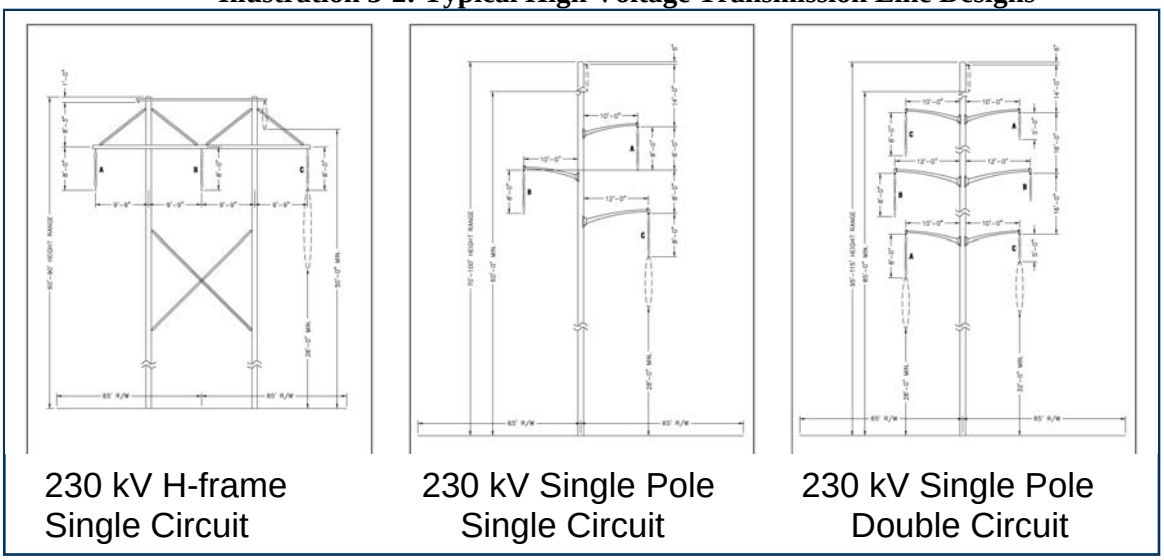
The Applicants have proposed the use of a single 1590 kcmil (thousand circular mil) aluminum conductor steel reinforced (ACSR) conductor for each of the three phases of the transmission lines from the Shannon to Essar Steel Plant substation, Boswell to Essar Mine substation, and Essar Mine substation to Essar Steel Plant substation. The 1590 kcmil conductors are intended to match the electrical performance of the existing 94 Line. A single 954 kcmil ACSR has been proposed for the Blackberry substation to Essar Steel Plant substation. ACSR conductors are commonly used for overhead HVTLs.

For the shield wires, the use of 3/8 inch diameter extra high strength steel (EHS) and fiber optic ground wire (OPGW) has been proposed.

3.3 TRANSMISSION LINE STRUCTURES

The Applicants propose the use of wooden H-frame structures for the single-circuit portions of the transmission lines and steel single pole, self-supporting structures for the double-circuit portions. Single pole structures may also be used for single-circuit portions where the width of the ROW is restricted due to existing infrastructure or development. Illustration 3-2 depicts the structure designs for the Proposed Project that are commonly used for HVTLs.

Illustration 3-2: Typical High Voltage Transmission Line Designs



Each H-frame structure would range in height from approximately 60 to 90 feet and be spaced approximately 600 to 1,000 feet apart. The poles of each H-frame structure would be spaced approximately 19 feet apart and embedded 10 to 15 feet into the ground. Corner and angle structures would be directly embedded with guy wires or set on reinforced concrete drilled shaft foundations as necessary.

Each single pole, self-supporting structure would be set on a reinforced concrete drilled shaft foundation. Heights would range from approximately 70 to 100 feet with spacing ranging from approximately 400 to 800 feet apart for single-circuit use. Double-circuit structures would range in height from approximately 95 to 115 feet with approximately 350 to 700 feet between structures.

3.4 SUBSTATIONS

The Applicants propose the construction of two new 230 kV substations, the Mine substation and the Plant substation, to serve the electric load. Additionally, modifications to the existing Minnesota Power 230 kV Blackberry substation are proposed to accommodate for an additional transmission line connection. The Mine substation would occupy 1.4 acres of property within the operational area of the Essar Steel plant facility. The Plant substation would occupy 4.5 acres of property on the north edge of the operational area of the steel plant. Both substations would be located on lands owned by Essar Steel Minnesota. Modifications to the Blackberry substation would take place on the existing footprint.

The Mine substation would be designed to include two new 230 kV line exits with a 230 kV five breaker ring bus and associated switches. Four of the breakers would be installed initially, with the fifth installed at a future date. Components of the substation would include two 230/13.8 kV transformers, a control house, relay panels, associated control and communication cables, foundations, steel structures, 13.8 kV breakers, switches, and transmission line exits.

The Plant substation would include three 230 kV line exits and be designed with a 230 kV four bay breaker and one half scheme with eleven circuit breakers and associated 230 kV switches and controls. Initially nine of the 11 breakers would be installed, with the additional breakers installed at a later date. The Plant substation would include a single 230/13.8 kV transformer. A second 230/13.8 kV transformer as well as a 230/34.5 kV transformer would be installed with Essar Steel facility additions. Additional substation components include a control house, relay panels, associated control and communication cables, foundations, steel structures, 13.8 kV breakers, switches, and transmission line exits.

Modifications to the Blackberry substation would include a new 230 kV line exit, a new 230 kV circuit breaker, and associated relay controls and communications. A 230 kV dead end line entrance structure, foundations, and 230 kV switches would be included as well. A new control panel would be installed within the existing control house as well as associated control and communication cables.

Final design of the new and modified substations has not been completed. Preliminary substation plans are included in Appendix D. The Applicants have indicated that the final design would take into consideration local conditions, safety requirements, and future maintenance as well as comply with National Electrical Safety Code (NESC), Occupational Safety and Health Act (OSHA), and state and local regulations.

3.5 DESIGN OPTIONS FOR FUTURE EXPANSION

Installation of the four proposed 230 kV HVTLs would serve the Essar Steel facility. The purpose of the Proposed Project is solely to supply electrical power to Essar Steel. As currently proposed, the new HVTLs can adequately meet the electrical power needs of the Essar Steel facility. Therefore, the

Applicants do not have plans to accommodate for future double-circuiting or delivery of additional megawatts of electricity.

3.6 UNDERGROUNDING OPTIONS

There are a number of considerations associated with installing underground transmission lines via directional boring or open trench methods. Underground construction activities are typically more invasive, and costs associated with underground systems are more than ten times greater than a comparable 230 kV overhead transmission system. Transition stations would be required at each end of an underground line and access manholes would need to be installed at regular intervals increasing infrastructure requirements.
Repair and restoration of faulty underground cables can be an intensive process. Repairs typically require complete cable replacement with the use of heavy equipment. Mobilization of such equipment could impact adjacent land use, and a permanent access road would likely need to be maintained to access manholes year round. Maintenance and repair operations typically take longer than repair to overhead transmission lines. Installing cable in cold conditions is not recommended which could further delay repair times. Re-energizing of underground circuits is not recommended until it is verified that the fault is not within the cable itself. Re-energizing a faulty cable can lead to explosions of gaseous byproducts. Outages could potentially last several hours as the underground cable is checked for faults prior to being re-energized.

The Applicants have proposed an overhead system as opposed to underground transmission lines due to operation and maintenance requirements, reliability and security of the system, potential environmental impacts, and associated costs.

3.7 RIGHT-OF-WAY REQUIREMENTS

The Applicants have indicated that a typical ROW width of 130 feet would be required for each of the 230 kV transmission lines. The Applicants intend to acquire a new 130 foot wide easement for the entire length of each of the four proposed HVTLs. If the new HVTL follows an existing ROW, such as a road or pipeline ROW, the Applicants would clear a new ROW such that there would not be any overlap. However, where the proposed HVTL follows an existing Minnesota Power HVTL, there would be a ROW overlap of approximately 15 feet. Construction activities would be limited to the ROW and no temporary easements would be required. Access to construction areas would be from public/private roads and trails. The impacts of the new lines may be reduced by following existing utility or public ROWs. Table 3-1 provides a summary of ROW adjacent to the proposed routes.

Table 3-1: ROW Adjacent to Proposed Routes (Miles)

Route	Route Length	Adjacent ROW Type					Total Length Shared	% of Length Shared
		Transmission Line	Road	Railroad	Pipeline	None		
1	7.5	0	0	0	0	7.5	0	0
1A	9.3	0	0.9	0	0	8.4	0.9	10
2	10.7	8.4	0	0	0	2.3	8.4	79
2A	9.7	0	2.3	0	0	7.4	2.3	24
3	14.4	11.4[1]	0.3	0	0	2.7	11.7	81
3A	18.5	8.6	0	0	0.8	6.2	9.4	51
4	2.8	0	1.4[2]	0	0	1.5	1.4	50
4A	3.1	0	1.1	0	0	2.0	1.1	35

[1] 2.4 miles of ROW is also shared with existing railroad
[2] 1.1 miles of ROW represents a proposed Essar Steel road alignment

4.0 Construction and Right-of-Way Acquisition

Prior to construction of the Proposed Project, the Applicants must obtain all applicable permits and approvals, as described in chapter 8 of this Draft EIS. In addition, the Applicants must also acquire the rights to the land for construction of the Proposed Project. This chapter provides information on the ROW acquisition process, HVTL construction methods, restoration activities, and maintenance procedures.

4.1 RIGHT-OF-WAY ACQUISITION PROCESS

The proposed ROW widths required for construction and operation of the 230 kV HVTLs is 130 feet. Easements have not been established to obtain the necessary ROWs for HVTL construction and operation along the proposed routes. In the event that a Route Permit is granted for the Proposed Project, the Applicants would begin the process of securing easements from landowners to allow for construction, operation, and maintenance of the transmission lines within the approved routes identified in the Route Permit. The Applicants' ROW acquisition process is detailed in section 4.2.1 of the Route Permit Application and summarized below:

- A search of public records for all involved lands would be performed by the ROW agent, and a title report would be developed.
- The ROW agent would contact each property owner to discuss construction concerns and structure placement.
- The ROW agent may request owner permission to perform preliminary survey or soil investigation work. Each structure location would be staked during the final stages of design.
- The ROW agent would determine the amount of compensation for the easement and negotiate with the landowner to settle on a fair and acceptable price to all parties.
- If a negotiated settlement is not possible, the Applicants may choose to obtain the ROW through eminent domain.
- Per Minnesota Statute, section 216E.12 subd.4, the property owner may require the Applicants to purchase the contiguous property if special circumstances exist.

4.2 CONSTRUCTION OF TRANSMISSION LINE AND STRUCTURES

Detailed construction procedures were presented by the Applicants in Section 4.2 of the Route Permit Application. The following sections summarize typical procedures for each step of the transmission line construction process.

4.2.1 Right-of-Way Access

Preparation of the ROW for access begins by coordinating with land and utility owners. Existing roads are used to access the actual transmission ROW whenever possible, and permission from property owners is obtained prior to accessing the HVTL from private property. New access points may need to be constructed along the selected routes where there is no existing access available.

The ROW is prepared for construction by first clearing and grubbing the area to provide a suitable construction area. Construction materials are either hauled directly to the structure sites via local

highways or railroads, or staged in temporary areas prior to delivery to structure sites. Development of staging areas outside of the transmission line ROW would be coordinated directly with local property owners by establishing temporary easements.

4.2.2 Grading

Transmission line structure heights and spacing would be designed to match the terrain of the approved final routes. This results in a minimal amount of grading necessary to construct the new transmission lines. However, in some instances minimal grading may be required to provide a level working surface at individual structure locations. Excavated materials are spread to promote site drainage. Temporary and permanent sediment and erosion control measures are utilized as necessary during and after construction to prevent impacts to wetlands and surface waters.

Illustration 4-1: Right-of-way clearing for new HVTL pole placement.

4.2.3 Structure Installation

Illustration 4-2: Augering holes for structure pole.

At structure locations within the ROW, a stable working surface is required for erecting each HVTL structure. Timber mats are commonly used to provide a stable working surface during construction if unstable soils are present. Structures and insulator assemblies are constructed on the ground and then raised into position with cranes. Each structure pole is set into a 10 to 15 foot deep augered hole. The annular space around each pole is backfilled with suitable native soils or granular materials.

Depending on the transmission line route angles and the soil types present, reinforced concrete foundations may be required at the structure location. When constructing reinforced concrete foundations, the hole is augered, reinforcing steel and anchor bolts are set, and ready-mix concrete is poured. Foundations are sized to the appropriate diameter and depth based on soil conditions. Temporary or permanent steel caissons are installed in wetlands or where excavation stabilization is required. After adequate curing, the steel pole base plates are bolted to the concrete foundation.

Structures are erected and fitted with stringing blocks and single-leader “p-line” ropes which reach the ground to allow for conductor installation. Stringing blocks are a type of pulley which attaches to the structure and supports the “p-line” rope. The “p-line” is used to string the conductor wires between the structures.

Illustration 4-3: Stringing a new HVTL.

4.2.4 Conductor Installation

The wire stringing process starts in a setup area prepared to accommodate the stringing equipment and materials necessary for installation of the conductor wires.

Equipment includes a rope machine, new conductor wire trailers, and a tensioner, which is used to pull each wire to the appropriate in-place tension. The construction crew pulls the “p-line” through each structure within a designated stringing interval. The pulling ropes are attached to a hard-line which is attached to the conductor wire. The conductors are pulled back through the stringing blocks to the end of the interval. Conductor wires are pulled to the appropriate tensions and clipped into place with permanent hardware. This process can take place during spring, summer, or fall conditions. Wetland areas may be strung in winter conditions when frozen conditions provide a stable work area.

Where waterways must be crossed by construction equipment, temporary clear span bridges would be utilized to minimize impacts. For waterways that cannot be crossed with equipment, construction crews may pull strings by hand, boat, or wait for frozen conditions.

4.3 SUBSTATIONS

Illustration 4-4: Conductor spooling and connection at substation.

The Proposed Project involves construction of two new substations, the Plant substation and the Mine substation, as well as modifications to the existing Blackberry substation. The Plant and Mine substations would be constructed on Essar Steel property. Modifications at the Blackberry substation would take place within the existing footprint of the substation. Therefore, ROW requirements are negligible for those substation construction activities.

Construction for the new substations would involve clearing and grubbing of vegetation within the substation footprint as well as within a 20 foot buffer area around the fence line. Grading would take place to prepare for equipment installation on approximately seven acres for the Plant substation and on three acres for the Mine substation. Concrete foundations would be poured and perimeter fencing installed at each site. Engineered fill would be used as required and a layer of rock applied within the perimeter of the fence following foundation and infrastructure construction.

Modifications to the Blackberry substation would take place within the existing fence line, and no vegetation removal or grading would be required. Concrete foundations would be poured and new substation equipment installed. Below grade control and communication cables would be installed as well, requiring minimal excavation.

4.4 RESTORATION

Restoration along the transmission line routes would take place as construction is completed. Ground disturbance at staging areas, each structure site, and stringing setup areas would be restored to as close as practical to the original condition or to an extent negotiated with the landowner. All construction equipment, materials, and debris would be removed following completed construction. Reseeding of disturbed areas would occur with vegetation similar to what was removed where applicable. Where tall growing vegetation (i.e., mature timber stands) has been removed, stumps would be treated to discourage re-growth and low growing vegetation would be established.

Any soil compaction due to construction activities would be remediated as negotiated with the appropriate landowners. Restoration activities at each substation construction site would include the removal and disposal of construction debris, reseeding with similar vegetation, and visual screening where appropriate.

4.5 DAMAGE COMPENSATION

Following restoration of the construction areas, the ROW agent would contact the landowners to determine their level of satisfaction with the restoration and to identify if damage to crops, fences, or property occurred. In the presence of damages, the landowner would be compensated accordingly by the Applicants.

4.6 MAINTENANCE

After construction of the HVTL, the Applicants would be required to access the ROW for maintenance or vegetation clearing of the utility easement as well as to repair or service the HVTLs and substations. A description of maintenance activities that would be conducted by the Applicants is provided.

4.6.1 Transmission Line

Post-construction activities along the transmission lines include periodic inspections, maintenance, and performing required repairs. These activities are limited to the ROW unless obstructions or terrain require off ROW access. The Applicants intend to use existing public roads to gain access to the ROW and use the ROW to travel to any areas requiring maintenance. If off ROW access is required for emergency or routine repairs, the Applicants would make every attempt to contact the landowner prior to crossing private property, and landowners would be compensated for damages incurred.

ROW vegetation would be controlled to allow for operations and maintenance activities, including tree trimming or removal as necessary. The Applicants typically perform annual inspections of the transmission line ROW to determine clearing requirements. Herbicide application, where allowed, or mechanical and hand clearing of vegetation would be performed as required to maintain the integrity of the transmission line easement. Noxious weed control with herbicides would be performed on a two-year cycle around structures and anchors where approved for use by the Department of Agriculture.

4.6.2 Substation

Regular inspections would be performed at each substation and routine maintenance and repairs are performed on equipment as required. Vegetation would be controlled as necessary to promote safe and reliable operations.

5.0 Affected Environment

Chapter 5 describes the affected environment and existing conditions for the Proposed Project and surrounding Study Area. The Study Area is the general area of Itasca County that surrounds all preferred and alternate routes. This general area is bounded on the west by the Taconite State Trail, on the east by the eastern boundary of the city of Nashwauk, on the north by the 94 Line, and on the south by 230/115 kV line that runs east-west. The Study Area includes water bodies, roadways, trails, infrastructure and other resources that may or may not be directly impacted by the Proposed Project. For this Draft EIS, the Proposed Project is considered the actual land and resources within the preferred and alternate routes as identified by the Route Permit Application and shown on Figure 1. As summarized in Table 1-1 in chapter 1, route widths vary for each route and route segment. Figures 7, 8, 9, and 10 depict the details of each proposed route and route alternative, including houses, water bodies, and wetlands within the routes. The Project Impact Area is considered the 130 foot ROW required for the HVTL alignment. Impacts associated with the Proposed Project, described in chapter 6, were analyzed based on the route alignment provided in the Route Permit Application.

Table 5-1: Draft EIS Analysis Areas

Term	Definition
Study Area	The general area surrounding the proposed routes and substations.
Proposed Project	The land and resources located within the routes.
Project Impact Area	The 130 foot right-of-way required for the proposed HVTL alignment.

There are a number of options for establishing routes that are considered when determining a final alignment for an HVTL. State and federal regulatory requirements, along with input from stakeholders were considered for the Proposed Project. Several criteria are required for consideration as part of the Route Permit Application for selecting the preferred and alternate routes. Some of the criteria include following existing ROWs, survey lines and natural division lines; minimize length; avoid populated areas; avoid major environmental features; minimize impact to property values; avoid or minimize impacts to water resources and wildlife; avoid or minimize impacts to cultural resources; and avoid or minimize impacts to businesses.

The criteria described above and variations in route widths provide flexibility for determining a final alignment. The width of the proposed HVTL routes is larger than the 130 feet needed for the HVTL ROW. The Draft EIS used the proposed HVTL routes to provide information on the affected environment (chapter 5), and environmental consequences and mitigation (chapter 6). Background information on the affected environment was given for the Study Area and Proposed Project. Analysis was completed for potential impacts based on the proposed HVTL alignment. Mitigation was considered for the Proposed Project and the proposed HVTL alignment.

Chapter 5 gives an overview of the affected environment and existing conditions for several topic areas that were identified in the Final Scoping Decision Document (FSDD) (Appendix A) for the Proposed Project. The information contained in chapter 5 is described in terms of the Study Area. In some cases route specific conditions are described when additional detail is needed to better understand affected environment within a route as a basis for assessing potential impacts. Route specific detail may include how many homes are located in a certain route or the number of wetlands within a specific route for example.

Topics described in the Draft EIS include the general environmental setting; socioeconomic setting; human settlement as related to proximity to structures, potential for displacement, property values, aesthetics, noise, interference, and public health and safety. Topics related to land-based economics, such as agriculture, zoning, land use compatibility, recreation, and historic resources are also described, as are natural environment topics including, air quality, water resources, wetlands, flora and fauna, and unique natural resources. Impacts and mitigation specific to each preferred and alternate route are described in chapter 6.

5.1 DESCRIPTION OF ENVIRONMENTAL SETTING

In general, the Proposed Project would be located in Itasca County, Minnesota on the Mesabi Iron Range (Figure 6). The four proposed routes, associated route alternatives, and two substations would serve the Essar Steel project near Nashwauk, Minnesota. The routes extend north, south, and west of the city of Nashwauk where each connects to an existing HVTL and/or existing substation. The total length of the proposed HVTLs could be up to 37 miles long with a ROW width of 130 feet. The route width used for Draft EIS analysis varies depending on the existing infrastructure. Specific information for each route is described in chapter 1 and summarized in Table 1-1.

The Study Area is located within the Nashwauk Uplands Ecological Subregion and the St. Louis Moraines Ecological Subregion.

The Study Area is located primarily within the Nashwauk Uplands Ecological Subregion. Based on information from the Minnesota Department of Natural Resources (MNDNR), this subregion includes end moraines, rolling till plains and flat outwash plains that are associated with the Rainy Lobe glacier. A unique feature of the landscape is Giants Range, which is a narrow bedrock ridge approximately 200 to 400 feet high, forming the southern boundary of the subregion. Portions of Routes 2/2A and 3/3A are also located in the St. Louis Moraines Ecological Subregion. This subregion is characterized by rolling to steep slopes formed by end moraines. Lakes, small bogs, and potholes are common features within both of the subregions. Average annual precipitation is typically between 24 and 27 inches.

The most common soil classification among the two subregions is boralf soils, which are considered cold, well-drained soils developed under forest vegetation. The majority of the soils are coarse-loamy to sandy soils. Presettlement vegetation included a mixture of deciduous and coniferous trees. Aspen-birch forest and mixed hardwood-pine forest were present on moraines and till plains. Aspen-birch was most common on the outwash, which had excessively well-drained sandy soils. Wetland vegetation included conifer bogs and swamps.

The current land use in the vicinity of the Proposed Project is primarily forestry and mining. Most land in Itasca County is either publically owned or owned by private forest companies. Quaking aspen is the dominant tree species in the area, which is managed and harvested by the forest industry. Recreation is also an important land use in the area, especially around area lakes.

5.2 DESCRIPTION OF SOCIOECONOMIC SETTING

The Proposed Project would be located in Itasca County between the cities of Grand Rapids and Hibbing. The Proposed Project extends north, south, and west of the city of Nashwauk. Specific information for each route is described in chapter 1 and summarized in Table 1-1.

The Study Area is primarily rural with several small communities along TH 169 that have populations less than 1,000 people.

The Study Area is primarily rural with several small communities along TH 169 that have populations less than 1,000. The HVTL routes would be located outside of the most populated areas of these communities.

Based on U.S. Census data, population trends for communities in the Study Area show a general decline between 1980 and 2000, although Itasca County as a whole experienced moderate growth (2.1 percent) during this time period. Some of the population decline may be due, in part, to the closing or downsizing of some major employers in the area, such as the Butler Taconite Facility that closed in 1985. The Butler Taconite Facility property is now the current site for the Essar Steel project.

Minnesota State Demographer's population projections indicate that the cities near the Proposed Project will continue to decline, but at slower rate, while Itasca County is projected to grow about 10 percent by 2035. There are currently a number of large-scale industrial projects proposed, under review, or under construction on the Iron Range, which could influence the current population and demographic trends for the area. According to the State Demographer's office, population projections have not taken into account the potential impact these future projects could have on population trends.

As summarized in Table 5-2, U.S. Census data from 2000 indicates that 10.4 percent of the population in the Study Area is below the poverty level. Data for the city of Nashwauk indicates that 14.6 percent of the population is below the poverty line. The population below the poverty level in Itasca County is 10.4 percent, which is higher than the state at 7.9 percent.

Table 5-2: Poverty Level and Income in 2000

Characteristics	Study Area	Itasca County	State of Minnesota
Individuals			
Number of Persons Below Poverty Level (1999)	414	4,576	380,476
Percent of Persons Below Poverty Level (1999)	10.4	10.4	7.9
Households			
Median Household Income (1999)	$38,061[1]	$36,234	$47,111

Source: USCB, 2000

[1] Average of four census block group median household income. Values ranged from $31,979 to $41,342.

The minority population in the Study Area is a small percentage (2.6 percent) of the total population. The city of Nashwauk is less than two percent minority, while Itasca County is 5.4 percent minority, as summarized in Table 5-3. The state of Minnesota has a minority population of 10.6 percent overall.

Table 5-3: Racial Characteristics Within Study Area, Itasca County, and Minnesota

		White	Native American	Asian	Other Races	Total
Study Area	Total	3,897	34	4	63	3,998
	Percent	97.5	0.9	0.1	1.6	100
Itasca County	Total	41,632	1,497	120	743	43,992
	Percent	94.6	3.4	0.3	1.7	100
State of Minnesota	Total	4,400,282	54,967	141,968	322,262	4,919,479
	Percent	89.4	1.1	2.9	6.6	100

Source: USCB, 2000

The primary industries and source of employment in the Study Area are forestry and mining, which are also the primary land uses in the area. Tourism and recreation also provide employment opportunities for service industry type jobs. The top three industries in Itasca County are listed in Table 5-4 as trade, transportation and utilities; government; and education and health services. The unemployment rate in the vicinity of the Proposed Project has typically been higher than state and national averages; and the state average has been generally lower than the national average. While unemployment rates had declined since the 1990s to about 6 percent in Itasca County, economic conditions in recent years have increased unemployment to about nine percent in the county as of October 2009 (DEED, 2009).

Table 5-4: Top Three Industries in Itasca County

Industry	Percent of Workforce
Trade, transportation, and utilities	16
Government	16
Education and health services	12

Source: Route Permit Application

As indicated previously, there are a number of large-scale industrial projects being considered on the Iron Range. Essar Steel Minnesota is one of those projects that are in the construction phase. According to the Minnesota Steel EIS (MNDNR, 2007), Essar Steel will bring an estimated 700 facility jobs to the area. Additional construction jobs will also be created from the project. The Essar Steel project will cause short and long term economic impacts by providing employment, which could potentially bring more people to the area. The potential influx of new residents will create higher demand for community services, such as groceries, healthcare, emergency services, and entertainment and recreation. These impacts will potentially create positive long term economic benefits, while creating a need for housing.

Independent School District 319 includes both the cities of the Nashwauk and Keewatin and the surrounding areas, mainly to the north and south of those cities. Based on data from the 2008-2009 school year, the student population for kindergarten through 12th grade is 622 and is 93 percent Caucasian, five percent Native American, and two percent African American. Free and reduced price lunches are provided to 52 percent of the students. The graduation rate for Nashwauk-Keewatin Schools is 93 percent (MDE, 2009). The elementary school is located in Keewatin, and the high school is located in Nashwauk.

5.3 HUMAN SETTLEMENT

In general, human settlement relates to how a community is formed, such as what structures are built, how development patterns occur, and the way people live within that community. Understanding the existing human settlement conditions provides a baseline for analysis of how a proposed project could potentially cause environmental impacts in a community.

This Draft EIS provides information on the existing conditions related to human settlement that were identified in the FSDD for the Proposed Project. Section 5.3 describes the affected environment as it relates to proximity to structures; potential displacement; property values; aesthetics; noise; interference to radio, television, internet or cellular phones; and public health and human safety related to electric and magnetic fields, implantable medical devices, and stray voltage. Potential impacts from the Proposed Project related to human settlement are discussed in chapter 6 for each proposed route and the proposed substations.

5.3.1 Proximity to Structures and Displacement

Several criteria for locating the preferred and alternate routes listed in the Route Permit Application are related to proximity to structures and displacement. These specific criteria included avoiding populated areas where feasible and avoiding or minimizing impacts to businesses. By avoiding populated areas, the likelihood of having conflicts with proximity to structures or displacement of residences or businesses is minimized.

For this Draft EIS, structures considered are residences, businesses, schools, daycares, hospitals, and cemeteries. A geographic information systems (GIS) analysis was completed for the Draft EIS that identified houses within the Proposed Project or within 500 feet of the proposed HVTL alignment. Detailed route maps were created (Figures 7, 8, 9, and 10) that display houses within and adjacent to each route and route alternative. Table 5-5 provides a summary of the houses located within each of the proposed routes.

Table 5-5: Number of Houses Within Each Route

Route	Number of Houses
1	29
1A	23
2	3
2A	19
3	5
3A	31
4	0
4A	6

Source: Wenck Associates

Houses located in Route 1 are scattered along Northwood Road in the central section of the route and along Hilltop Road and Creek Road in the southern part of the route, totaling 29 houses within the route. Route 1A has a concentration of homes just south of County State Aid Highway (CSAH) 54 along County Road (CR) 564 and a few more homes along Little Sweden Road to the south for a total of 23 houses. Route 2 has three houses near the existing 28 Line. Route 2A has 19 houses, which are primarily located near the intersection of CR 334 and CSAH 7. Route 3 is located along a primarily existing alignment for 62 and 63 Lines. Route 3 has five houses within the route. Route 3A has the most houses identified as being located within the proposed route. The majority of those houses are located in the Trout Lake Township (T55 R24) portion of the route. Routes 4 and 4A are located between the Essar Steel Plant substation and the Mine substation. There are no homes located within Route 4, while Route 4A has six houses, located between Big Sucker and Little Sucker Lakes.

Table 5-6 shows the number of houses within 500 feet from the centerline of the HVTL alignment. The 500 foot distance from the HVTL alignment was selected to provide a conservative estimate of how many houses may be near the HVTL alignment. Houses within 500 feet of the alignment are more likely to have potential impacts, such as visual impacts depending on the vegetative cover between the sightline of the house and HVTL.

Table 5-6: Houses Within 500 Feet of Route Alignment

Route	Number of Houses
1	4
1A	7
2	7
2A	7
3	16
3A	8
4	0
4A	5

Source: Wenck Associates

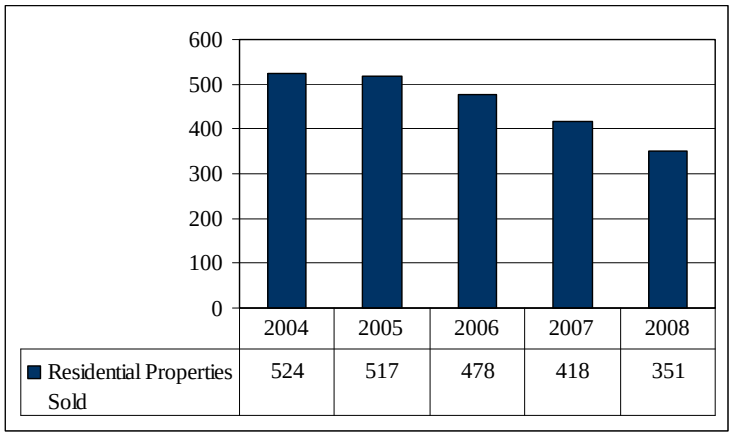
In some cases, the proposed HVTL alignment does not run the center of the route, therefore, the number of homes within 500 feet of the HVTL alignment may be more than the number of the homes within the route. This is the case in Routes 2 and 3, which run within existing transmission line routes 500 feet wide. The houses within 500 feet of the alignment in Route 2, but outside of the route are near Reilly Beach Road and CSAH 7. For Route 3, the houses within 500 feet are primarily near Pengilly along the existing 62 and 63 Lines.

5.3.2 Property Values

Property values are dependant on a number of factors. Location and housing demand (i.e., housing market) are two of the biggest influences on property value. The size, condition, and quality of a house also influence its value. Historically, the housing market across the United States and in Minnesota has experienced an upward trend in property sales and the price at time of sale. In recent years, economic conditions and housing supply versus demand have created a slower housing market that has seen a decrease in property values compared to approximately three years ago.

According to Itasca Economic Development, "in 2008 one third of all properties listed on the multiple listing service (MLS) by members of the Itasca Board of Realtors were sold versus nearly two thirds in 2004. These listings included all residential, lots, acreage, and commercial properties." Residential property sales dropped in Itasca County by 33 percent between 2005 and 2008. Foreclosures in the county increased from 48 in 2004 to 77 in 2005, but have remained fairly level for the past four years with 72 in 2008 (Itasca ED, 2008). Illustration 5-1 provides a summary of the residential properties sold in Itasca County between 2004 and 2008.

Illustration 5-1: Residential Properties Sold in Grand Rapids Area



Source: Itasca ED, 2008

There has been a downward trend in the number of homes sold each year since 2004. However, "while other markets in the U.S. have seen more dramatic declines in property values, Itasca County sellers were able to receive 94 percent of their list price in 2008" (Itasca ED, 2008).

The median sales price for a home in Minnesota has steadily decreased over the past two to three years. Since May 2009, trends indicate that median list prices in the state have leveled off at around $197,455 for single family residential homes (Cyberhomes, 2009). Table 5-7 shows the number of homes, average sales price, percentage of the list price, and average days on market for each type of residential property around the Grand Rapids, Minnesota area.

Table 5-7: Single Family Housing Sales 2009 Statistics for the Grand Rapids Area[1]

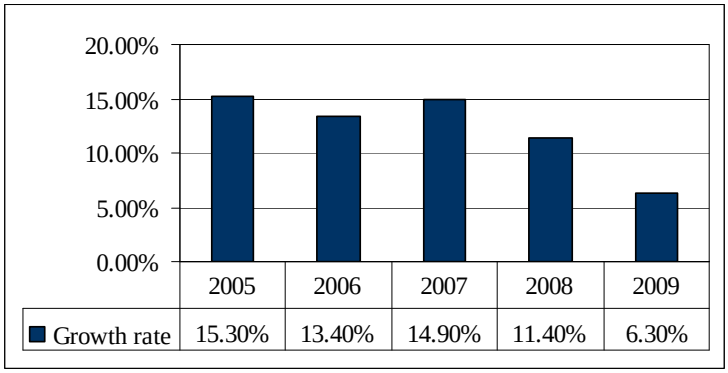
Residential Property Type	Total Listed Properties	Number Sold	Average Sales Price	Percentage of List Price	Average Days on Market
City of Grand Rapids	160	84	$123,062	95.04%	149
Out of Town (3 or less acres)	406	137	$95,286	94.20%	170
Out of Town (3 or more acres)	272	88	$145,140	94.77%	142
Waterfront	438	97	$229,240	91.52%	204
Condo/Townhouse	29	6	$133,055	97.31%	100

Source: Itasca County Board of Realtors
[1] Year to date as of 12/9/09

Based on the data in Table 5-7, residential property in the Grand Rapids area sells on average for about 94.5 percent of its listing price within six months of going on the market. Houses in the city of Grand Rapids property type sold just over half of the houses listed in that property type. Other property types sold approximately one-third or less of the houses listed.

Property values fluctuate depending on the housing market. Annual property market growth reflects the increase in total estimated market value from year to year. Illustration 5-2 shows the estimated annual property market growth in Itasca County for 2005 to 2009. The annual growth data includes new taxable construction and increases in assessed market value of pre-existing properties. The data indicates that 2009 showed the lowest increase (6.3 percent) in five years despite new taxable construction being at its highest level in five years. The increase in new taxable construction is attributed to a number of large commercial properties being built, including Wal-Mart, Target, and Timberlake Lodge, for example (Itasca ED, 2008).

Illustration 5-2: Estimated Annual Property Market Growth



Source: Itasca ED, 2008
[1] Includes all property in Itasca County (i.e., residential, commercial, land)

As described in section 5.2, a number of large-scale industrial projects are either under construction or are being proposed in the region. If a majority of these proposed projects were to be constructed and begin operation, employment opportunities would be created. It estimated that the number of jobs compared to the available workforce in the region could require workers from outside of the region to move to the area. This could create a need for additional housing and could therefore change the current state of the housing market in Itasca County.

Potential impacts that the Proposed Project could have on property values is discussed in chapter 6.

5.3.3 Aesthetics

Aesthetics relies on human perception and how each person visually sees or views their surroundings. Aesthetic resources are the various elements of the landscape that contribute to the visual character of a place. These elements can be either natural or human-made and include objects, vistas, and viewsheds. Examples of scenic resources could include outstanding natural features, dramatic vantage points, or pristine landscapes.

The Proposed Project setting is primarily rural with rolling hills covered by forest, scattered wetlands, and open areas. There are also rural residences scattered throughout the Study Area, mainly along existing transportation corridors. Past and present mining activity has also altered the presettlement landscape. Open pit mines and mining stockpiles can be seen from certain vantage points. The colors of the landscape are seasonally variable and include green forest canopy and understory foliage in late spring and summer, followed by fall when deciduous trees change colors and drop their leaves. Winter typically provides enough snow to cover the ground for several months, while trees remain leafless, except for conifers which provide dark green color to the primarily white landscape. The Proposed Project would be located within

currently undeveloped areas or along existing transmission line or other utility corridors. Land use/land cover is further discussed in sections 5.4.3 and 5.5.4. Potential visual impacts are discussed in chapter 6 for each proposed route.

5.3.4 Noise

Noise is defined as unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels (dBA), which was developed to approximate the human ear's sensitivity to certain frequencies by emphasizing middle frequencies and de-emphasizing lower and higher frequencies. In terms of dBA, a sound increase of 3 dBA is barely perceptible to the human ear, while a 5 dBA increase in sound level is clearly audible. An increase of 10 dBA is heard twice as loud. Additionally, due to the logarithmic scale used for measuring dBA, multiple sounds of the same level are not additive. For example, a doubling of identical sound sources yields an increase of 3 dBA (i.e., 85 dBA + 85 dBA = 88 dBA, not 170 dBA). Table 5-8 provides typical noise levels of common sounds.

Table 5-8: Decibel Levels of Common Noise Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
120	Rock Concert
100	Jackhammer (at one meter)
80	Heavy Truck Traffic
60	Conversation Speech, Typical TV Volume
50	Library
40	Bedroom
20	Whisper

Source: MPCA, 2009

Current noise standards for the state of Minnesota are found in Minnesota Rules, part 7030.0040, subp. 2. The rules for permissible noise vary according to the Noise Area Classification (NAC) for the area. In a residential setting, for example, the noise restrictions are more stringent than in an industrial setting. The rules also distinguish between nighttime and daytime noise; less noise is permitted at night. The standards detail that the sound levels not to be exceeded for 10 and 50 percent of the time in a one-hour survey (L_{10} and L_{50}) for each NAC, as described in Table 5-9.

Table 5-9: Applicable Minnesota Noise Standards

Noise Area Classification		Noise, Standard, dBA			
		Daytime (7 am to 10 pm)		Nighttime (10 pm to 7 am)	
		L_{50}	L_{10}	L_{50}	L_{10}
1	Residential	60	65	50	55
2	Commercial	65	70	65	70
3	Industrial	75	80	75	80

Source: Minnesota Rules 7030.0040

The standards are given in terms of the percent of time during a measurement period (typically one hour) during which a particular decibel dBA level may not be exceeded. A daytime L_{50} of 60 dBA, for example, means that during the daytime, noise levels may not exceed 60 dBA more than 50 percent of the time (i.e., 30 minutes of an hour).

Some land uses are considered more sensitive to intrusive noise than others due to the type of activities typically involved at the sensitive human noise receptors, such as residences, schools, hospitals or daycare centers. The Study Area is comprised of mainly rural residential land uses. Rural residential homes are considered NAC 1 (residential). The Essar Steel project is classified as industrial NAC 3.

Ambient sound pressure levels in a particular region are composed of a variety of natural and manmade sources. Currently, noise in the Study Area is dominated by traffic on local roads. Secondary noise in the

area persists from low-density, rural development and some mining-related activities where routes are closest to active mining areas. Ambient noise levels in the Study Area are typical of noise levels experienced within a predominantly rural area.

HVTLs can produce audible sound from transmission line conductors and substation equipment. The transmission line conductors can generate electromagnetic noise referred to as corona, which is a small amount of electricity ionizing the moist air near the wires. This can create an audible noise that would likely be heard near the transmission line conductors and the substation equipment. The level of noise generated by the conductors depends on conductor conditions, voltage level, and weather conditions. In foggy, rainy, and wet conditions, transmission conductors can create a crackling sound due to corona. All transmission lines can generate a small of amount of sound from corona, but it becomes more noticeable at higher voltages (i.e. 345 kV or higher).

The main source of audible noise from a substation is due to the operation of the transformers. Transformers produce noise whenever they are energized, and the level of the noise depends on transformer size, voltage level, and weather conditions. Potential impacts from noise are discussed for each route in chapter 6.

5.3.5 Interference

Radio, television, internet, cellular phones, and similar communication devices can be affected by an HVTL system through interference of the electromagnetic energy emitted at various frequencies by these devices or their antennae. The Proposed Project has the potential to impact electronic communication within the Study Area. Communication signals within the Study Area can be divided into two categories: omnidirectional and unidirectional. Microwave signals are unidirectional, and radio, television, cellular phones, and other communications utilize omnidirectional signals.

5.3.5.1 Omnidirectional Signals

Omnidirectional signals are transmitted and received by antennae from all directions. In general, interference does not occur with omnidirectional signals. However, there are four potential sources of interference: gap discharges, corona discharges, shadowing, and reflection. Descriptions of these sources of inference are provided.

Omnidirectional signals, utilized by electronic communications, are transmitted and received by antennae from all directions.

Gap discharges may occur where small gaps have developed between mechanically connected metal parts of the HVTL. Sparks discharge across these gaps and can create electrical noise. The interference depends on the transmitted communication signal quality and strength, antenna system quality, and the proximity of the signal receiver to the electrical line. Gap discharges are reflective of maintenance issues due to broken or loose fitting hardware along the transmission line. Therefore, interference from gap discharges can be resolved via repairs to the transmission line system.

Corona discharges are caused by irregularities on the conductors, including scratches or nicks, dust buildup, or water drops. Localized electric fields near an energized conductor produce small electric discharges that ionize the nearby air. The air ionization results in an energy loss which can generate radio frequency electrical interference. This energy loss is minimized in the design stage by selecting the appropriate conductor size. The potential for interference from corona discharges relates to the magnitude of the induced radio frequency noise compared to the communication broadcast signal strength.

Shadowing and reflection interference is associated with large structures which disturb broadcast signals and lead to poor reception. HVTL structures or conductors can create a “shadow” on adjoining properties that affects the reception quality of the transmitted signal. Structures may also cause a “reflection” or scatter the signal. Reflected signals lead to the original signal breaking into two or more signals. If the arrival of a signal is delayed relative to another signal, picture quality can be affected. In the case of analog signals, a second image can appear on screen. Digital images can become pixilated or freeze and become unstable.

Radio Signals

As discussed above, corona discharges can generate electrical noise in the radio frequency range. If interference from corona occurs for an AM radio station, reception can be improved by modifying the receiving antenna. Interference with FM broadcast reception is generally not an issue because corona generated radio frequency noise decreases in magnitude with increasing frequency and is small in the FM broadcast band (88-108 mHz). FM broadcast systems also utilize interference rejection properties which essentially make them immune to amplitude disturbances.

Television Signals

Corona generated noise as well as structure placement could potentially cause television signal interference. Both digital and analog signals can be affected. However digital signals are more tolerant of noise than analog; and analog signals are more resistant to reflections than digital. Congress mandated a national transition to digital television broadcasts, which has been completed. However, the transition did not apply to low-power television (LPTV) stations. The Federal Communications Commission (FCC) has not determined a deadline for LPTV transition to digital broadcasts. Over the air television signals within the Study Area may be transmitted and received in either digital or analog and potential affects to both should be considered.

Satellite television is transmitted on a band of radio frequency which is typically not susceptible to corona generated noise. Line of sight may be an issue for satellite television users but can be addressed by simply moving the satellite dish.

Cellular Phones and Wireless Internet

Radio frequency noise is not an issue for cellular phones or wireless internet devices due to the ultra-high frequency (UHF) on which they operate. As stated previously, radio frequency noise decreases as frequency increases. Radio frequency noise is practically nonexistent within the UHF range.

5.3.5.2 Unidirectional Signals

Unidirectional signals are transmitted and received by antennae from one direction. Unidirectional point to point systems operate at a high frequency and are line of sight dependent. The potential for unidirectional signal interference is dependent on infrastructure placement. For example, a unidirectional signal could be interrupted if an HVTL structure or conductor were placed within the line of sight between two unidirectional signal towers.

Unidirectional signals utilize shorter wavelengths, meaning higher frequencies, and are focused in one direction for a number of communications purposes.

Microwave antennas utilize unidirectional signals that have shorter wavelengths (i.e., shorter wavelengths means higher frequency) and are focused in one direction. There are currently four microwave towers located within the Study Area. Minnesota Power owns and operates two existing microwave towers, used for utility communications and are located at the 230 kV Blackberry Substation and at the 115 kV Nashwauk Substation. Two additional microwave towers are located within the Study Area along CSAH 58 near the Essar Steel Plant site.

5.3.6 Public Health and Safety

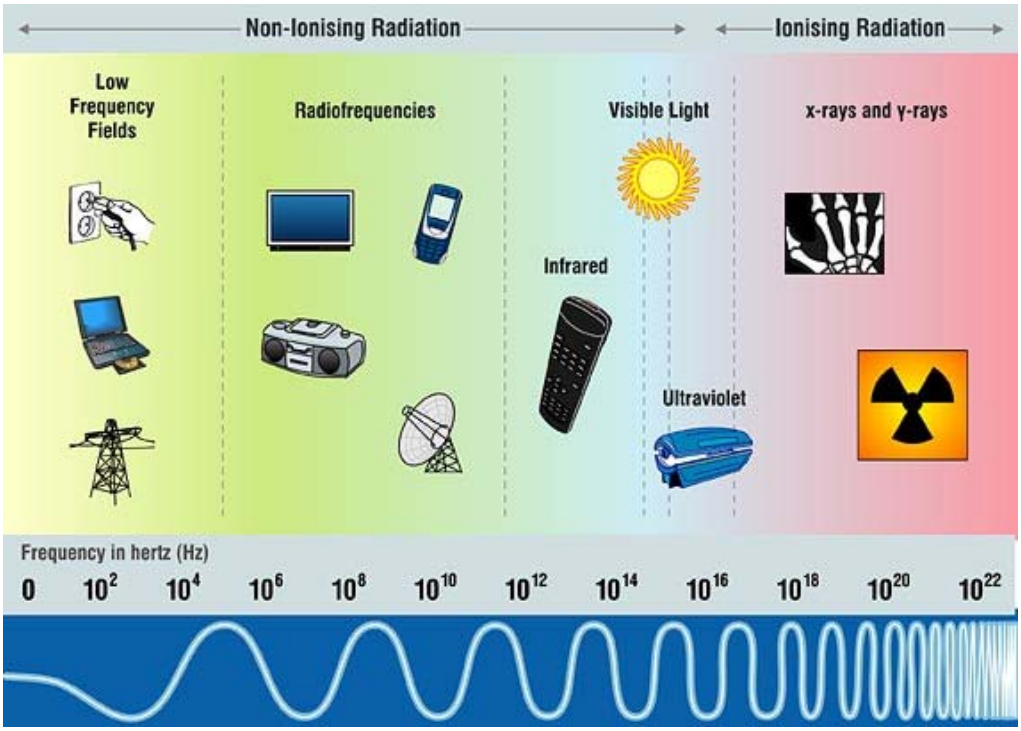
The Proposed Project has the potential to affect public health and safety. Concerns were raised by the public during the EIS scoping process related to public healthy and safety. These concerns include potential impacts from electric and magnetic fields (EMF), induction, and stray voltage. There was also concern regarding potential impacts to implantable medical devices, general human health, and public safety from the Proposed Project. These concerns were included as topics in the FSDD for analysis in the Draft EIS.

5.3.6.1 Electric and Magnetic Fields

EMF is created by all devices which use, carry, or produce electricity.

EMFs exist where electricity is produced or used. Invisible lines of force surround electrical wires that conduct electricity. EMF is created by all devices which use, carry, or produce electricity. Exposure to EMF occurs on a daily basis as it is created in homes and businesses by appliances, lights, and other electronic devices. EMF from many transmission lines is similar to the typical background levels found in most homes (when measured at a distance of 300 feet from the transmission line during average electricity demand). Illustration 5-3 depicts typical EMF levels from an HVTL compared to other common devices.

Illustration 5-3: Electromagnetic Spectrum



Source: http://hermes.physics.auth.gr/en/emrinfo_basic

EMF associated with power substations is strongest at the transmission lines entering and leaving the station. The EMF from the transformers, reactors, capacitor banks, and other substation

equipment decreases with distance. Beyond the substation fence line, EMF is typically indistinguishable from background levels.

Electric Fields

In HVTL systems, electric fields are proportional to the voltage on the conductor and are present even when there is no current flow. The voltage produces an electric field in the surrounding area which extends from the conductors to nearby objects such as the ground, towers, vegetation, buildings, and vehicles. This electric field grows weaker with increasing distance from the transmission line.

Electric field intensity is measured in kilovolts per meter (kV/m). There is no federal regulation for electric field intensity from transmission lines. However, several states have adopted their own regulations. In the state of Minnesota, the Commission has established a guideline for maximum electric field strength of 8.0 kV/m in the ROW. The peak intensity of the electric field for the Proposed Project would be 3.1 kV/m. The transmission line electric field intensity is measured one meter above ground beneath the conductors. Appendix D of the Route Permit Application provides the predicted electric fields for each line design option of the Proposed Project.

Magnetic Fields

Current passing through a transmission line conductor produces a magnetic field around the conductor. The strength of the magnetic field is proportional to the electric current flowing through the conductor. Magnetic field strength is measured in milliGauss (mG) and decreases in strength with increasing distance from the conductor.

Operating at capacity, the proposed transmission lines would create a magnetic field of 129 mG to 355 mG under the conductors and 12 mG to 100 mG at the edge of the ROW. The maximum magnetic field of 355 mG beneath the conductors would drop to less than 42 mG within 100 feet of the centerline. During normal operation the peak current flow would be less than the conductor capacity, and the magnetic fields produced would be significantly smaller than those stated above. Appendix E of the Route Permit Application provides the magnetic fields for the Proposed Project if operated at capacity.

5.3.6.2 Induction and Stray Voltage

When an electric field extends to a nearby conductive object, a voltage is induced on the object.

When an electric field extends to a nearby conductive object, a voltage is induced on the object. The magnitude of the voltage depends on the objects ability to collect an electric charge (capacitance), shape, size, orientation, location, object to ground resistance, and weather conditions. If a voltage is induced on an object insulated from the ground and a person touches the object, a small current would pass through their body to the ground. This current may produce a spark discharge or mild shock to the individual. Most shocks from induced current are considered more of a nuisance than a danger. However, to insure public safety, the National Electric Safety Code (NESC) requires induced current of less than 5 milliAmperes (mA) for objects under transmission lines. The Applicants have used computer modeling to estimate the spark discharge from a typical school bus stopped mid-span beneath a 230 kV line. The modeled spark discharge current was less than 2 mA which is significantly lower than the NESC standard.

HVTLs carry power at a high voltage from generating plants to substations. At the substation the voltage is lowered for distribution and distribution lines delivery power to consumers (homes, businesses, industry). Power distribution lines may cause stray voltage on electric service entrances to structures. Transmission lines do not create stray voltage as they do not directly connect to

businesses or residences. However, transmission lines can induce stray voltage on a distribution circuit running parallel or beneath the transmission lines.

5.3.6.3 Implantable Medical Devices

Exposure to EMF can impact implanted cardiac devices such as pacemakers or implantable cardioverter defibrillators (ICD) by creating electromagnetic interference (EMI). The effects of EMI vary between individuals and make and model of the pacemaker or ICD. For HVTLs, electric fields are the concern for EMI because magnetic field levels that would create problems are generally much larger than those produced by the HVTL.

Interference can occur if the strength of the electric field is high enough to induce currents in the body that would lead to interaction with the implanted device. Modern bipolar devices are less susceptible to electric field interaction than older monopolar designs. Medtronic is a major manufacturer of modern pacemakers and ICDs. Electric fields lower than 6 kV/m will not interfere with Medtronic implantable devices. However, studies have shown that interaction with other manufacturers' pacemakers can occur from electric field exposure (typically in monopolar devices). EMI has been documented in pacemakers at electric field levels as low as 1.5 to 2.0 kV/m. Medtronic recommends an exposure threshold for EMF of 1.0 Gauss (G) for magnetic fields and "two to three foot distance from the pacemaker to high voltage lines for every 10,000 volts" for electric fields (PSCW 2001).

5.3.6.4 Human Health

The effect of EMF on human health has been the subject of study for over 25 years. Of particular concern is the link between EMF exposure and cancer. Studies regarding EMF exposure and childhood leukemia and other cancer risks have had mixed results. Some organizations have determined that a link between EMF and cancer exists while others have found this link to be weak or nonexistent.

In 1992, Congress initiated U.S. EMF Research and Public Information Dissemination (EMF RAPID). EMF RAPID program studied whether exposure to electric and magnetic fields produced by the generation, transmission, or use of electric power posed a risk to human health. Program conclusions were presented to Congress in June of 1999. The following is an excerpt from the report:

The NIEHS believes that the probability that ELF-EMF exposure is truly a health hazard is currently small……The scientific evidence suggesting that extremely low frequency EMF exposures pose any health risk is weak.

In October 1996, a National Research Council Committee of the National Academy of Sciences released a report which corroborated the findings of EMF RAPID. The report concluded:

Based on comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard.

Despite the consensus of these organizations, and multiple others, in 2001 the World Health Organization International Agency for Research on Cancer classified power-frequency EMF as a "possible carcinogenic to humans." At this time, there are no federal standards in the United States to limit EMF exposure. Health hazards associated with EMF are still under scientific debate.

5.3.6.5 Public Safety

Maintenance of the physical components of the Proposed Project is important to better ensure public safety. However, even with proper maintenance, broken lines, and other unpredictable events, such as vehicular accidents, storms, and fires, can occur to HVTLs.

Transmission lines are equipped with safety devices to disconnect power in the event of a broken line. However, if such devices fail, a downed line may be live and pose a serious injury or death risk. Line breaking is most often the result of a vehicular collision with a structure pole. The transmission line structures pose a risk for motorists and pedestrians as falling structure components could cause injury or death. Fallen structures could also block roadways and trails increasing the risk to motorists, pedestrians, and recreational vehicle users. HVTLs have the potential to cause fires since connection devices can fail causing structures to burn. This creates a risk for brush or forest fires which may also be caused by animal or bird contact with a live wire.

5.4 LAND-BASED ECONOMICS

The value derived from natural resources and amenities in an area constitute land-based economics. How a natural resource is used and the type of economic value a community places on that resource is important to understand when analyzing the potential impacts of a proposed project. A community in northern Minnesota may view agriculture differently than a community in southern Minnesota. If a proposed project would impact agriculture land, for example, the magnitude of impacts would be viewed differently depending on the community.

This Draft EIS provides information on the existing conditions related to land-based economics that were identified in the FSDD for the Proposed Project. Section 5.4 describes the affected environment as it relates to agriculture; zoning and land use compatibility; recreation and tourism; and archaeological and historic resources. The existing conditions of the natural resources in the Study Area are described in section 5.5. Potential impacts from the Proposed Project related to land-based economic topics are discussed in chapter 6 for each proposed route and the proposed substations.

5.4.1 Agriculture

The existing land uses in the Study Area are primarily forest management/logging and mining. However, there are several scattered farms and crop lands within the Study Area and in the vicinity of the Proposed Project. According to the 2007 Census of Agriculture, the number of farms has decreased over the past ten years in Itasca County. Similarly, the average size of farms has also decreased from 242 acres in 1997 to 223 acres in 2007. Approximately 47 percent of farmland is used for crop production with the remaining majorities being used as woodland or pasture land. The primary crops grown in Itasca County include hay, oats, soybeans, and corn. Sales from these crops in 2007 were $3,677,000.

Within the Proposed Project, the majority of agriculture-related land cover is associated with pasture and hay as shown in Table 5-10. The total acres of agricultural-related land cover within all routes are approximately 1,128 acres. Most of the agricultural-related activities are in Route 1 and 1A. Route 1 has 305 acres of pasture and hay, while Route 1A has 263 acres of pasture and hay. Route 2 has just over ten acres of pasture and hay, while Route 2A has over 212 acres. Route 3 has just over 83 acres of pasture and hay, and Route 3A has198 acres of pasture/hay and less than two acres of grass pasture. Routes 4 and 4A have almost equal amounts of pasture and hay at around 18 acres.

Table 5-10: Agriculture-Related Land Cover in the Proposed Project

Route	Ag-related Land Cover	Acres
1	Pasture/Hay	305.1
	Soybeans	17.0
1A	Pasture/Hay	263.3
2	Pasture/Hay	10.2
2A	Fallow Idle Cropland	0.8
	Pasture/Hay	212.9
3	Pasture/Hay	83.1
3A	Grass Pasture	1.5
	Pasture/Hay	198.1
4	Pasture/Hay	17.8
4A	Pasture/Hay	18.1
All Routes	**TOTAL**	**1,127.9**

Source: NASS, 2008

5.4.1.1 Prime Farmland

Agricultural land that is designated as prime farmland indicates land that is most desirable for agricultural production. The Code of Federal Regulation 7 CFR 657 defines prime farmland as, "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses." Table 5-11 summarizes the acres of prime farmland soils located within each route. There is a total of 10,174 acres of prime farmland soils located within the Proposed Project. The majority of these soils are located in Routes 1 and 1A.

Table 5-11: Farmland Soils

Route	Farmland Soil Classification	Acres	Route Totals
1	All Areas are Prime Farmland	1,347.4	2,128.3
	Farmland of Statewide Importance	15.0	
	Prime Farmland, if drained	765.9	
1A	All Areas are Prime Farmland	1,266.6	1,902.6
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	636.0	
2	All Areas are Prime Farmland	321.5	420.3
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	98.8	
2A	All Areas are Prime Farmland	720.4	1,393.7
	Farmland of Statewide Importance	82.8	
	Prime Farmland, if drained	590.5	
3	All Areas are Prime Farmland	538.5	810.2
	Farmland of Statewide Importance	20.5	
	Prime Farmland, if drained	251.2	
3A	All Areas are Prime Farmland	2,127.1	2,600.9
	Farmland of Statewide Importance	80.7	
	Prime Farmland, if drained	393.1	

Route	Farmland Soil Classification	Acres	Route Totals
4	All Areas are Prime Farmland	304.8	410.2
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	105.4	
4A	All Areas are Prime Farmland	368.0	508.4
	Farmland of Statewide Importance	14.9	
	Prime Farmland, if drained	125.5	
All Routes	**Total Farmland Soils**	**10,174.6**	**10,174.6**

Source: NRCS

Of the total acres of farmland soils, 929 acres is currently in agriculture-related use within the Proposed Project, as summarized in Table 5-11 and shown on Figure 11. The majority of those acres are pasture and hay.

There are an estimated 1,251 acres of Conservation Reserve Program (CRP) in Itasca County. CRP lands are grassland and legume croplands that are planted to protect and improve the soil and cannot be harvested or pastured. These areas are enrolled in the CRP for 10-year periods. Information on the exact locations of CRP lands was unavailable at the time of this Draft EIS publication. Based on available information, few if any acres of CRP are suspected to be located within the Proposed Project.

5.4.1.2 Livestock

The most common livestock raised in Itasca County includes cattle, poultry, horses, and hogs. Agricultural products sold (i.e., ag crops and livestock) in 2007 totaled $7,419,000 in Itasca County. Livestock sales accounted for $3,742,000 of those total sales. Of the total livestock sales, $2,427,000 was cattle and calves. The primary agricultural land cover of pasture and hay in the Proposed Project is reflective of the primary livestock sales being cattle.

5.4.2 Mining and Forestry

Mining and forestry have been a historical use of the land in northeastern Minnesota and within the Study Area. These two industries are part of the local economy and provide numerous jobs in the region. The Proposed Project would be located in areas utilized for mining and forestry.

5.4.2.1 Mining

The historic use of the land on the Mesabi Iron Range since the late 1800s/early 1900s has been mining for iron ore. The Iron Range is a major, well-known geologic feature oriented roughly northeast to southwest between the cities of Babbitt and Grand Rapids, Minnesota. The Iron Range has been the largest source of iron ore produced in Minnesota.

The Essar Steel site, located on the western end of the Iron Range, was first mined for iron ore in 1903. Since that time, the Essar Steel mine has grown in size; was closed for several decades; and is now reopening as a taconite mine and steel making facility.

Taconite mining is accomplished through open pit methods. Surface layers (i.e., vegetation, soil, and rocks) are removed in order to excavate the Biwabik Iron Formation for low-magnetic ores, known as taconite. Once excavated, taconite is brought to the processing plant and turned into taconite pellets, which will be used by Essar Steel to produce rolled sheet steel. The surface layers,

known as overburden, are stockpiled primarily outside of the open pit mine. Some stockpiles can reach up to 300 feet high and be a number of acres in size. As required by Minnesota Rules 6150, the stockpiles are revegetated and eventually become covered by trees, understory and grasses.

The Proposed Project is needed for operation of the facility. Portions of the proposed HVTLs and associated Essar Steel substations would be located on Essar Steel property within the vicinity of open pit mines, stockpiles, and other mining activities.

5.4.2.2 Forestry

The forest products industry is another major industry in northeastern Minnesota. There are loggers, paper mills, and other wood products processing facilities that utilize a combination of private, county, state, and federal land for timber harvest and wood products supply.

The Proposed Project is located in the Nashwauk Uplands Ecological Subregion, as described in section 5.1. This subregion consists primarily of aspen and white birch along with upland shrub tree species. Other tree species types in this subregion include lowland conifer forest, such as black spruce and tamarack, and lowland shrubs. Forest resources in the Study Area are provided in Figure 12.

Timber harvest is influenced by market demand for wood products, which dictates the type of tree species to be harvested. Aspen is plentiful in northeastern Minnesota and is used to produce paper. UPM Blandin operates a paper mill located in Grand Rapids. In 2008, the facility's production capacity was approximately 330,000 metric tons of lightweight coated paper for use in magazines and catalogs. The company strives to purchase wood from third-party verified sources, including 23 percent from the Minnesota Certified Master Logger (MCML) program. Third party verified forest sources ensure that harvested wood is supplied from forest lands that are responsibly managed for economic and environmental sustainability.

5.4.3 Zoning and Land Use Compatibility

The existing land use in the Study Area is primarily forest management/logging and mining with interspersed residential and recreational land uses. Some of the former mining areas and tailings basins have been reclaimed and are now revegetated. The majority of the Study Area is located in Itasca County, but also includes proposed route segments that occur within the municipal boundaries for the cities of Nashwauk and Taconite.

Itasca County has zoning authority over the majority of the Study Area, where the Proposed Project is outside of municipal boundaries (Figure 13). The city of Nashwauk has zoning authority within its municipal boundary, which includes the Essar Steel project area. The city of Taconite maintains zoning authority within its municipal boundary.

Itasca County requires all land use ordinances to be consistent with the 2007 Itasca County Comprehensive Land Use Plan. The Itasca County Zoning Ordinance was recently updated in March 2009. Under county zoning, the Study Area has several zones: rural residential, industrial, and open space. There is also shoreland overlay zoning in place, which regulates the state minimum shoreland standards around lakes and streams designated as MNDNR public waters. The shoreland standards regulate areas within 1,000 feet around designated lakes and 300 feet along designated streams. The shoreland overlay zoning regulations prevail over underlying zoning. Essential services are a permitted use within a shoreland overlay district. HVTLs and associated substations are considered an essential service. The poles, pole mounted appurtenances, wires, and other materials associated with the construction of HVTLs and substations are considered special structures under Section 24.2.100 of the 2009 Itasca County Zoning Ordinance. A

special structure does not require a building permit and are not subject to setback requirements as prescribed in the ordinance.

The city of Nashwauk does not regulate the construction of HVTLs in the current ordinance. The proposed substations were included in the city building permit for the Essar Steel project, which has already been permitted by the city. The city of Taconite does not regulate the construction of HVTLs in the current ordinance.

5.4.4 Transportation and Public Services

Transportation and utility infrastructure is established in the Study Area. The Proposed Project would cross or be located adjacent to a variety of existing roadways and infrastructure within the Study Area. A description of the existing transportation, public services, and utilities network is provided. Potential impacts from the Proposed Project to transportation and public services are discussed in chapter 6 of this Draft EIS.

5.4.4.1 Existing Utilities

There are two governing municipalities within the Study Area, the city of Nashwauk and the city of Taconite. The HVTL routes proposed by the Applicants cross through the boundaries of these municipalities. Nashwauk Public Utilities Commission (NPUC) is a commission of the city of Nashwauk that provides electrical power, sewer and water to residents and businesses within city limits. Additionally, there are some areas outside the city limits that receive water and sewer from the NPUC. The city of Taconite does not provide water or wastewater services to their residents, only electrical services are provided. The majority of the area along the proposed HVTL routes is located outside of these municipal service areas and consists of residents on private water supply in the form of individual wells.

The NPUC currently does not provide natural gas to their customers, although they do have the option to provide gas service in the future. There is an existing pipeline near Routes 3 and 3A, which is a regional transmission pipeline (Northern Natural Gas Company) used for natural gas distribution. This pipeline would be crossed by Routes 3 and 3A. The Route Permit Application makes note of two additional pipelines near Route 3 and 3A, a state approved NPUC pipeline not yet constructed, and a Mesaba Energy Project pipeline in the process of environmental review.

Residents, both inside and outside Nashwauk city limits, do not use natural gas for heat, but use alternative methods (i.e., wood, liquid propane, electricity). The existing utility infrastructure in the Study Area is displayed in Figure 14.

The existing electrical distribution and transmission lines in the region range in size from 69kV to 230kV HVTL. These transmission lines interconnect the region at several regional substations including Boswell, Shannon, and Blackberry substations. The Study Area includes electrical lines under management and ownership of Minnesota Power. Table 5-12 lists the HVTLs in the Study Area.

Table 5-12: Existing Electrical Lines

Size	Line Number	Service Location	Ownership
230kV	94 Line	1, 1A, 2, 2A	Minnesota Power
115kV	28 Line	2, 3, 3A	Minnesota Power
115kV	63 Line	3	Minnesota Power

Source: Route Permit Application

5.4.4.2 Public Services

Public services are often those services provided to citizens by government, such as emergency services (i.e., fire, ambulance, and police), potable water, education, and waste management. Public services and facilities are generally located within or near the cities in the Study Area.

The city of Nashwauk is serviced by police and fire protection. The police station is located at 2 Hawkins Street and the fire station is located off of CSAH 8. The nearest hospital is the Fairview University Medical Center – Mesabi, located in Hibbing, Minnesota, and the nearest clinic is located at 402 E Platt Avenue in Nashwauk. The city of Taconite is serviced by police protection through the Itasca County Sheriff's Department, and fire protection is serviced by the city of Marble. The nearest hospital/clinic is the Grand Itasca Clinic and Hospital located in Grand Rapids, Minnesota.

5.4.4.3 Highways and Roads

The existing roadway infrastructure in and around the Study Area is mainly comprised of two-lane paved and gravel roads (Figure 14). The existing roadway system would provide access to the proposed HVTL routes. These roads include U.S. Highway 169 which, although mainly a two-lane highway in the region, is a four-lane highway between Pengilly and Nashwauk, State Highway 65, several County State Aid Highways (CSAHs), and county and township roads. Private single-lane roads and driveways are also used by landowners to access their property.

The established roadway network provides access and necessary services to local industry, municipalities, homesteads, and scattered farms in the Study Area, mainly in Routes 1, 1A and 2. These roads are used to distribute goods and services throughout the region. The key roadway networks in the Study Area are TH 169, CSAH 7, TH 65, CSAH 8, and CSAH 70 which each average over 500 trips per day.

5.4.4.4 Railways

The existing railway infrastructure in and around the Study Area is characterized by a single main track and several minor routes branching out along the mine pits and adjacent communities (Figure 14). The established railway network provides access and transportation services to the local industry and mines in the Study Area. These railways are used to distribute manufactured goods and products throughout the area as well as transport mining material to and from the region. There are approximately 11 miles of main track in the Study Area between the city of Taconite and the city of Nashwauk. The Burlington Northern Santa Fe (BNSF) has an average of one train per day using the main track between Taconite and Nashwauk (MNDOT, 2009).

5.4.4.5 Airports

Itasca County offers one regional, public airport located in Grand Rapids, Minnesota. There are several other small municipal airports in the region. Big Fork Municipal Airport, which is located just north of the city of Bigfork, and Bowstring Airport located west of the city of Bowstring. However, no airports are in the city of Taconite, the city of Nashwauk, or in the Study Area. There are landing strips located at two locations near Routes 1 and 1A in the Study Area. One of the landing strips is considered to be active, and the other is considered as inactive status.

5.4.5 Recreation

Tourism in the Study Area contributes to the local economy. Itasca County has an abundance of lakes which has encouraged tourism to local parks, resorts, and campgrounds. There are many outdoor and

recreational opportunities within the vicinity of the Proposed Project including: recreational trails, parks, wildlife management areas (WMAs), scientific and natural areas (SNAs), and other land available for public access (Figure 15). There are designated snowmobile trails as well as walking and bicycling trails. The abundance of recreational amenities in Itasca County encourages a growing tourism economy. In addition, community and county historical societies have begun to promote heritage tourism in the area. There are a number of historic structures, districts and museums where visitors can learn about the past. More information on archaeological and historic resources is provided in section 5.4.6.

5.4.5.1 Recreational Trails

The Taconite State Trail stretches 165 miles from Grand Rapids to Ely. According to the MNDNR, the first six miles of the trail from Grand Rapids are paved for biking and in-line skating. The remainder of the natural surface trail is used primarily for snowmobiling in the winter. Portions of the trail are suitable for horseback riding, hiking, and mountain biking in the summer. As the trail winds through the western side of the Study Area, it crosses streams and forested areas before it eventually connects to McCarthy Beach State Park to the northeast.

> There are a number of recreational trails in the Study Area, including four snowmobile-only trails, the Taconite State Trail, and the Mesabi Trail.

Snowmobile trails in the Study Area include the Taconite State Trail (Trail #61), Itasca Trail Greenway Trail (Trail #141), Keystone Trail (Trail #143), Lawron Trail (Trail #148), and Suomi Clearwater Trail (Trail #222). The Taconite State Trail is not groomed in the winter, but can be used by snowmobiles. The other snowmobile trails in the Study Area are partially funded through the MNDNR Grant-in-Aid (GIA) Program and are maintained and groomed by local snowmobile clubs. Ownership of the trails remains private when on private land, but the snowmobile clubs and respective counties have worked with landowners to obtain easements in order to route trails and operate snowmobiles across private property.

The Itasca Trail Greenway Trail is located south of TH 169 and primarily runs east-west through the Study Area. The Keystone Trail starts near Grand Rapids and runs east in the vicinity of the TH 169 corridor toward the city of Calumet. The Lawron Trail is located north of TH 169 and runs east-west in the general location of what has been identified as proposed Route 2A. The Suomi Clearwater Trail connects the Lawron Trail to the Taconite Trail on the northern edge of the Study Area.

The Mesabi Trail is a walking and bicycling trail. This trail is owned, operated, and maintained by the St. Louis and Lake Counties Regional Railroad Authority. The Mesabi Trail is planned to extend along the length of the Iron Range from Grand Rapids to Ely. It is a paved trail closed to motorized vehicles with the exception of a few short segments that allow snowmobiles to connect to another trail. Major funding is from federal, state, and local sources.

Starting in Grand Rapids and continuing on to Virginia, Minnesota, the longest paved section of the Mesabi Trail traverses the Study Area through the cities of Coleraine, Bovey, Taconite, Marble, Calumet, Pengilly and Nashwauk. Much of the trail runs parallel to the TH 169 corridor.

5.4.5.2 Parks

Hill Annex Mine State Park is located in the city of Calumet on the north side of TH 169. This state park encompasses the open-pit mine and mining facilities of the Hill Annex Mine, which are listed on the National Register of Historic Places (NRHP). According to the MNDNR, the state park is also designated as a site along the Heritage Tour route of northeast Minnesota. The park has a visitor’s center and offers guided tours, but does not have camping, overnight accommodations, or recreational trails.

Communities in the Study Area have local city parks, but based on the proposed locations of the routes, these facilities would not be impacted by the proposed HVTL and were therefore not inventoried for this Draft EIS.

5.4.5.3 Recreational Land

There are many acres of Itasca County forest land and state forest land scattered throughout the Study Area (Figure 15). These areas are generally open to and used by the public, but may have specific restrictions depending on the recreational activity (e.g., ATV, snowmobile, or hunting). There are also many acres of contiguous forest land currently owned by Blandin Paper Company (UPM-Kymmene Corporation), most of which are located north of TH 169 in the general location of proposed Routes 2 and 2A.

The MNDNR recently signed an open agreement with Blandin to purchase conservation easements that would permanently preserve existing hiking, snowmobile and ATV trails and keep the land open to public hunting, fishing and other recreational uses. Blandin would still be able to actively manage their forests for timber harvest, but no development or subdividing of land would be permitted once a conservation easement is in place. Blandin lands identified in the open agreement total 187,000 acres for conservation easement and up to 1,300 acres of fee title. Some of the lands identified are in the Study Area (MNDNR, 2009).

There are no other state owned lands, such as wildlife management areas (WMAs) or scientific and natural areas (SNAs) located within the Study Area.

5.4.6 Archaeological and Historic Resources

The Proposed Project is located on the Mesabi Iron Range. Prior to European settlement Native American Indians inhabited the area. Historically, the main tribe in the area was the Ojibwe, which was considered a Woodland type culture. The Ojibwe lived off the land by harvesting plants, such as wild rice, hunting animals for food and clothing, and using birch bark and other natural materials to build homes and canoes. Eventually, European settlement and treaties signed with the U.S. Government moved the Ojibwe onto reservations.

In about the 1860s, Minnesota's mineralogical and iron mining potential became of interest to the state legislature. The development of the taconite pelletizing process made mining the ore from the Iron Range more feasible and profitable (Gronhovd, et al., 2009). By the 1880s, new industry and employment opportunities had been created on the Iron Range that brought an influx of immigrants to work for the mining companies. The Iron Range became home to over 43 different ethnic groups, including Scandinavians, Finns, Irish, Slovaks, and Italians for example (Syrjamaki, 1940).

> Identification of archaeological and historic resources in a project area is required by federal regulations, typically Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended.

The construction of an HVTL has the potential to disturb land and can alter landscapes which could impact archaeological and historic resources within a project vicinity. Archaeological and historic resources are places, structures, artifacts, and other items that reflect the significance of our culture during a certain period of time. Identification of these resources in a project area is required by federal regulations, typically Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended. The Minnesota State Historic Preservation Office (SHPO) enforces the requirements of Section 106 and reviews resources that may be eligible for listing on the National Register of Historic Places.

The Route Permit Application for the Proposed Project indicated that available SHPO records for potential archaeological and historic resources within the proposed routes were reviewed. The Applicants indicated in the Route Permit Application that identified resources were avoided "to the greatest extent possible and in consideration with other natural resources and existing conditions." According to the Route Permit Application, SHPO records were reviewed in April 2009 to identify any known archaeological resources within one mile of the proposed HVTL route centerlines. A literature review was also conducted which search for reports of previously surveyed areas relevant to the Study Area.

The background information obtained during the SHPO records review and literature search is summarized for each of the proposed routes in Table 5-13.

Table 5-13: Architectural Sites Within One Mile of the Proposed Routes

Route	Site Number	Site Name	Location			NRHP Status
			T	R	S	
Route 1 / 1A						
1	IC-NWT-001	Property No. 2	57	23	2	Not evaluated
1	IC-NWT-002	Waimo and Saimi Karimo Farm	57	23	1	Not evaluated
1/1A	IC-UOG-040	The Labor Temple/"Finn Hall"	58	23	36	Not evaluated
1/1A	IC-UOG-037	Hietala Log Barns	58	22	19	Not evaluated
Route 2 / 2A						
2/2A	IC-LAW-003	Lawrence Township Hall	57	24	34	Not evaluated
2/2A	IC-LAW-004	Bridge No. 7415	57	24	33	Not evaluated
2A	IC-LAW-002	Church	57	24	27	Not evaluated
Route 3 / 3A						
3	IC-NWC-001	Nashwauk Hospital	57	22	32	Not evaluated
3	IC-NWC-002	Nashwauk Water Tower	57	22	32	Recommended as not eligible (no longer standing)
3	IC-NWC-003	Ollila Hotel	57	22	35	Recommended as not eligible (no longer standing)
3	IC-NWC-004	Memorial Building	57	22	32	Recommended as eligible
3	IC-NWC-005	Nashwauk Village Hall	57	22	32	Not evaluated
3	IC-NWC-006	Raatama's Department Store	57	22	32	Not evaluated
3	IC-NWC-007	United Methodist Church	57	22	32	Not evaluated
3	IC-NWC-008	Nashwauk High School	57	22	32	Not evaluated
3	IC-NWC-009	Nashwauk Fieldhouse	57	22	32	Not evaluated
3	IC-NWC-010	Great Northern Railway Depot	57	22	5	Recommended as not eligible (no longer standing)
3	IC-UOG-012	Log Barn and Building	55	23	16	Not evaluated
3/3A	IC-UOG-013	Log Barn	55	23	30	Not evaluated
3/3A	IC-UOG-014	Log Barn	55	23	30	Not evaluated

Route	Site Number	Site Name	Location			NRHP Status
			T	R	S	
3/3A	IC-UOG-015	Log Building	55	23	30	Not evaluated
3	IC-UOG-046	Kinn Farmhouse	55	23	4	Not evaluated
3/3A	IC-TLT-004	Abandoned Log House and Barn	55	24	13	Not evaluated
3/3A	IC-TLT-005	Jacob Edward Johnson Farmstead	55	24	13	Not evaluated
3/3A	IC-TLT-009	Finnish Log Barn and Building	55	24	24	Not evaluated
3/3A	IC-TLT-010	Trout Lake Apostolic Lutheran Church	55	24	24	Not evaluated
3/3A	IC-TLT-011	School and Teacherage	55	24	24	Not evaluated
3/3A	IC-TLT-012	Log House	55	24	25	Not evaluated
3A	IC-IRT-008	Holman Mine Line to the Trout Lake Washing Plant	56	24	22, 27, 28, 33	Recommended as eligible
3A	IC-IRT-009	Great Northern Railway Nashwauk-Gunn Line	56	24	22	Recommended as eligible
3A	IC-IRT-010	Duluth, Missabe & Northern Railway Alborn Branch Line	56	24	22	Recommended as eligible
3A	IC-IRT-012	Holman Mine Stripping and Lean Ore Dump	56	24	22	Recommended as eligible
3A	IC-IRT-013	Brown No. 2 Mine Stripping	56	24	22	Recommended as eligible
3A	IC-IRT-016	Rhude Media Plant	56	24	23	Not evaluated
3A	IC-IRT-017	House	56	24	23	Not evaluated
3A	IC-IRT-018	House	56	24	23	Recommended as eligible
3A	IC-IRT-021	Taconite and Holman Mine Spur	56	24	22	Not evaluated
3A	IC-TCC-001	Oliver Mining Company Housing	56	24	22	Not evaluated
3A	IC-TCC-002	Bank Building	56	24	22	Not evaluated
3A	IC-TCC-003	Taconite Water Tower	56	24	22	Not evaluated
3A	IC-TCC-005	Bridge No. L3811	56	24	22	Not evaluated
3A	IC-TCC-007	Bridge No. 3363	56	24	23	Not evaluated
3A	IC-TLT-007	Log Barn/Wood Silo	55	24	22	Not evaluated
3A	IC-TLT-008	School/Town Hall	55	24	23	Not evaluated
Route 4 / 4A						
4	There are no previously recorded archaeological resources within one mile of proposed Route 4 or Route 4A in the SHPO database.					

Source: Route Permit Application based on SHPO database review

In addition to the SHPO records, there is an unconfirmed report of burial mounds in the vicinity of Little Sucker Lake that are within one mile of all of the proposed routes, except Route 3, which is further than one mile from where the burial mounds may be. SHPO records indicate that a landowner

reported two Native American burial sites to the Deputy County Surveyor in the Little Sucker Lake area along CSAH 58. The exact location has not been verified.

Archaeological and historic resources vary in type, size, condition, and location. Some of these resources are important to one person or group more than another. There is not always an understanding of the significance of a resource or even what a particular resource may be. Given this nature of archaeological and historic resources, there may be additional resources in the Study Area that have not yet been identified or recorded in the SHPO database.

5.5 NATURAL ENVIRONMENT

Itasca County has an abundance of natural resources including lakes, streams, forests, and wetlands. The existing conditions of the natural resources in the Study Area provide a baseline for analysis of potential impacts. HVTL projects typically traverse miles of land through undeveloped areas and along existing utility corridors. The existing conditions of the natural resources influence the design, alignment, and construction of a new route.

This Draft EIS provides information on the existing conditions related to the natural environment that were identified in the FSDD for the Proposed Project. Section 5.5 describes the affected environment as it relates to air quality; water resources; wetlands; flora and fauna; and rare and unique natural resources and critical habitat. Potential impacts from the Proposed Project related to the natural environment are discussed in chapter 6 for each proposed route and the proposed substations.

5.5.1 Air Quality

The current air quality status in the Study Area is summarized by the type of air pollutant including criteria pollutants and greenhouse gases.

HVTLs generally are not viewed as primary sources of air pollution. The HVTL may generate corona, or electrical discharges, that can generate ozone and nitrogen dioxides from the oxygen and nitrogen naturally contained in air. Both ozone and nitrogen dioxides are criteria pollutants. Some theories (Henshaw Effect) propose that corona may also allow fine particulate air pollutants already in the air to become ionized which may increase the air pollution's deposition within the lungs.

Construction of the HVTLs may generate short-term air emissions during construction both from tailpipe emissions from construction vehicles and from wind blown dust generated from the transfer of soils or from exposed surfaces. Tailpipe emissions include both criteria pollutants and greenhouse gases. Dust emissions would be considered particulate matter and regulated as a criteria pollutant.

Electrical substations use sulfur hexafluoride (SF_6) as an electrical insulator. While SF_6 is nontoxic, it is a strong greenhouse gas. A description of criteria pollutants and greenhouse gases, as well as the standards and regulations that govern their emissions is provided.

5.5.1.1 Criteria Pollutants

The U.S. Environmental Protection Agency (USEPA) has designated Itasca County and northern Minnesota as attainment for all six criteria pollutants. The attainment status means that all Minnesota air quality standards as well as all National Ambient Air Quality Standards (NAAQS) are currently being met. The ambient air quality standards are established to protect the public health and welfare for air pollutants of concern. Table 5-14 below displays the current National Ambient Air Quality Standards.

Table 5-14: National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour [1]	Same as Primary	
	35 ppm (40 mg/m^3)	1-hour [1]		
Lead	0.15 µg/m^3 [2]	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average		
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour [3]	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual [4] (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour [5]		
Ozone	0.075 ppm (2008 std)	8-hour [6]	Same as Primary	
	0.08 ppm (1997 std)	8-hour [7]		
Sulfur Dioxide (SO_2)	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m^3)	3-hour [1]
	0.14 ppm	24-hour [1]		

Source: USEPA's http://epa.gov/air/criteria.html website

In addition to the National Ambient Air Quality Standards above, Minnesota also has additional state ambient air quality standards, which are provided in Table 5-15. The Minnesota ambient air quality standards listed in the table below are provided for those pollutants and averaging periods that are more stringent than established federal standards. In all other cases the enforced standards match the federal standards.

Table 5-15: Additional Minnesota Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Hydrogen Sulfide	0.05 ppm (70 µg/m^3)	½ hour average [1]	None	
	0.03 ppm (42 µg/m^3)	½ hour average [2]		
PM_{10}	50 µg/m^3	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter	75 µg/m^3	Annual (Arithmetic Mean)	60 µg/m^3	Annual (Arithmetic Mean)
	260 µg/m^3	24-hour [3]	150 µg/m^3	24-hour [3]
Sulfur Dioxide	Same as NAAQS	Annual	0.02 ppm (60 µg/m^3)	Annual
	Same as NAAQS	24-hour [3]	None	
	0.5 ppm (1300 µg/m^3)	3-hour [3]	0.35 ppm (915 µg/m^3)	3-Hour [3] in Air Quality Regions 127, 129, 130, and 132 (northern Minnesota)
	0.5 ppm (1300 µg/m^3)	1-hour [3]	None	

[1] Not to be exceeded more than two times per year.
[2] Not to be exceeded more than two times in any consecutive five days.
[3] Not to be exceeded more than once per year.

The USEPA has published proposals in the Federal Register for an additional one-hour average NO_2 and SO_2 National Ambient Air Quality Standards. These proposal standards are not finalized and therefore not part of the current standards regulating air emissions.

5.5.1.2 Greenhouse Gases

The USEPA has recently issued an endangerment finding indicating that greenhouse gas emissions threaten the public health and the environment. The greenhouse gases defined by the USEPA include: carbon dioxide (CO_2) methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). USEPA indicates that the elevated greenhouse gas concentrations are due to human activity. Examples of human activities that produce green house gases include the use of industrial solvents, refrigerants, insulants, fertilizers, fossil fuel combustion, and landfill gas. The effect of greenhouse gases on Minnesota's climate is believed to be similar to that observed across the rest of the United States.

The USEPA passed a greenhouse gas reporting rule and has also proposed to regulate greenhouse gases under the existing New Source Review and Title V Clean Air Act programs. Congress may pass cap and trade legislation in addition to or in place of USEPA's proposal.

5.5.2 Water Resources

There are significant water features within Itasca County and the Study Area. The Proposed Project will be constructed across or adjacent to a variety of existing water resources. A discussion of the existing surface water features (lakes, rivers and streams), floodzones and groundwater is provided for the Study Area. The potential impacts to lakes, river, streams, floodzones and groundwater, including water quality or physical alterations, from the Proposed Project are discussed in chapter 6 of this Draft EIS. A listing of potential mitigation options for project related impacts is also provided.

5.5.2.1 Surface Water

The water quality of lakes, rivers and streams is influenced by a variety of regional factors such as geology, soils, land cover (i.e. vegetation communities), climate and hydrology. Based on those factors, geographic regions termed Ecoregions have been defined in Minnesota, which exhibit similar type and quality of environmental resources. Seven ecoregions have been defined for Minnesota (Griffith and Omernik, 2008) and the Proposed Project lies within the Northern Lakes and Forest Ecoregion. Lakes within the Northern Lakes and Forest Ecoregion are generally characterized as clear, deep, infertile systems (i.e., low concentrations of nutrients such as phosphorus) with good game fish populations (MPCA, 2009). The waterbodies within this region are sensitive to landscape alterations and are susceptible to damage from pollution created by mining, logging, shoreland development, or urbanization.

The Study Area is located within the Mississippi River Watershed, which is subdivided into several sub-watersheds in Minnesota. The Study Area falls within the sub-watershed named the Mississippi River-Grand Rapids Watershed (Hydrologic Unit Code 07010103), which has a drainage area of over 2,050 square miles. There are over 1000 lakes and ponds and more than 1,800 miles of rivers, creeks and streams located within the Mississippi River-Grand Rapids Watershed. There are also significant numbers of wetlands across the region, as well as significant man-made water features including tailings basins and historic mine pits that have filled with water. Water generally flows to the southeast within the watershed, following the overall flow path of the Mississippi River.

The Study Area contains a large number of lakes, streams, rivers and wetland basins (Figure 16). The routes identified by the Applicants range from 2.8 to 18.5 miles in length, traversing significant amounts of the landscape in Itasca County. Due to the large number of water features in Itasca County and the overall length of the identified Routes, there are a significant number of lakes, rivers and streams within and adjacent to each of the routes. The Rivers and streams in the Study Area are listed in Table 5-16. The lakes within one mile of the proposed HVTL routes are listed in

Table 5-17. Unnamed streams, creeks and lakes are listed by the major water feature they are tributary to while unnamed lakes and basins are listed by their Public Waters Inventory number (PWI #).

Table 5-16: River and Creeks Within the Project Area.

Rivers and Creeks	Routes (Within or Adjacent)
East River	Route 1, 1A
East River – unnamed tributary	Route 1
East River – unnamed tributary	Route 1
East River – unnamed tributary	Route 1A
East River – unnamed tributary	Route 1A
Oxhide Creek	Route 3
O'Reilly Creek	Route 2
Pickerel Creek	Route 3
Prairie River	Route 2, 2A
Prairie River – unnamed tributary	Route 1
Prairie River – unnamed tributary	Route 1, 1A
Snowball Creek	Route 3
Sucker Brook	Route 2A, 4A
Sucker Brook – unnamed tributary	Route 2A
Sucker Brook – unnamed tributary	Route 2A
Sucker Brook – unnamed tributary	Route 2A
Swan River	Route 3, 3A
Swan River – unnamed tributary	Route 3
Swan River – unnamed tributary	Route 3A
Swan River – unnamed tributary	Route 3A
Swan River – unnamed tributary	Route 3A

Table 5-17: Lakes and Basins Within One Mile of the Proposed HVTL Routes.

Lakes and Basins	PWI #	Routes (Within or Adjacent)
Bass Lake	31-0207-P	Route 3A
Big Diamond Lake	31-0223-P	Route 3A
Big McCarthy Lake	31-0120-P	Route 1
Big Rainbarrel Lake	31-0408-P	Route 2, 2A
Big Sucker Lake	31-0124-P	Route 2, 4A
Dirty Mike	31-0343-W	Route 2
Dollar Lake	31-0139-P	Route 1
Dunning Lake	31-0221-P	Route 3A
Foot Lake	31-0090-P	Route 3A
Harrison Lake	31-0140-P	Route 1
Holman Lake	31-0227-P	Route 3A
Inkey Lake	31-0240-P	Route 2, 2A
Island Lake	31-0217-W	Route 2
Johnson Lake	31-0045-P	Route 1A
Little Diamond Lake	31-0226-W	Route 3A
Little Inkey Lake	31-0241-W	Route 2, 2A
Little McCarthy Lake	31-0123-P	Route 1
Little O'Reilly Lake	31-0220-P	Route 2
Little Sand Lake	31-0093-P	Route 3
Little Sucker Lake	31-0126-P	Route 3A, 4, 4A
Loon Lake	31-0104-W	Route 3A

Lakes and Basins	PWI #	Routes (Within or Adjacent)
Lower Panasa	31-0112-P	Route 3
North Twin Lake	31-0190-P	Route 3A
O'Reilly Lake	31-0219-P	Route 2
Oxhide lake	31-0106-P	Route 3
Rainbarrel	31-0400-P	Route 2, 2A
Shamrock Lake	31-0218-P	Route 2
Shoal Lake	31-0141-P	Route 1
Snowball Lake	31-0108-P	Route 3
South Twin Lake	31-0191-P	Route 3A
Spring Lake	31-0114-W	Route 3A
Swan Lake	31-0067-P	Route 3
Tadpole	31-0401-W	Route 2, 2A
Unnamed Basin	31-0087-W	Route 3
Unnamed Basin	31-0089-W	Route 3
Unnamed Basin	31-0091-W	Route 3A
Unnamed Basin	31-0094-W	Route 3
Unnamed Basin	31-0103-W	Route 3A
Unnamed Basin	31-0105-P	Route 2, 3A
Unnamed Basin	31-0107-W	Route 3
Unnamed Basin	31-0125-W	Route 2A
Unnamed Basin	31-0229-W	Route 2A
Unnamed Basin	31-0378-W	Route 2
Unnamed Basin	31-0380-W	Route 2
Unnamed Basin	31-1078-W	Route 2

The Minnesota Pollution Control Agency (MPCA) has conducted assessments, often in conjunction with local partners, to identify lakes, rivers and streams that have impaired water quality. Assessments are conducted under the Total Maximum Daily Load (TMDL) program which aims at identifying the specific pollutant(s) that have created an impairment in a waterbody and the determining the amount of improvement necessary for the water body to meet state of Minnesota water quality standards for a healthy system. Within the Study Area there are no lakes that have been identified as impaired, although the Itasca County Soil and Water Conservation District (SWCD) is still in the process of completing water quality assessments in the area. The Swan River is the only river in the Study Area that has been identified as having a water quality impairment. The Swan River is currently on the MPCA impaired waters list as impaired for aquatic recreation due to low dissolved oxygen levels.

5.5.2.2 Floodzones

Precipitation within Itasca County averages approximately 28 inches per year, ranging from as little as 20 inches during dry years to over 34 inches during wet years. The Federal Emergency Management Agency (FEMA) has designated flood zones in Minnesota for areas likely to experience flooding during large precipitation events, including the 100-year and 500-year events. The importance of identifying flood zones with relation to proposed construction efforts is to determine the potential for impacts to the flood zones in terms of loss of flood water storage due to fill or identifying potential flood threats to constructed infrastructure (i.e. inundation of substations as a result of a flood). Within the Study Area floodzones have typically been identified around significant water features including large rivers such as Swan River, Prairie River, Mississippi River and large lake basins such as Crooked Lake and Prairie Lake. Floodzones within the Study Area are displayed in Figure 16.

5.5.2.3 Ground Water

Groundwater resources are defined by the geologic features of the aquifer including the type and depth of bedrock and the nature of soils. The Study Area is located within the groundwater recharge area known as the Mississippi River Headwaters (HA-278). In the Study Area bedrock is comprised of the Precambrian iron formation, with bedrock located between 100 and over 500 feet below ground surface. The surficial geology is made up of moraines that consist of sand and gravel aquifers that are generally 5 to 50 feet in thickness and located from 50 to 500 feet below the surface. Groundwater generally flows south and southwest in the Study Area. The Hydrological Atlas (HA-278) states that within the city of Nashwauk groundwater is located from 197 to 540 feet below the surface and that the saturation thickness of the aquifer is 150 to 200 feet. Groundwater in the region is used for municipal, residential and industrial consumption. Additionally, a large amount of dewatering of groundwater resources is conducted by the mining industry when operations to excavate ferrous resources extend to significant depths.

5.5.3 Wetlands

The Proposed Project is located in Itasca County, in a region of Minnesota that contains abundant wetlands of varying types dominated by shrub swamps, wooded swamps, and conifer bogs. According to the Minnesota Board of Water and Soil Resources (BWSR), Itasca County contains greater than 80 percent of wetlands that existed prior to settlement. The Proposed Project is located within the Mississippi River-Grand Rapids Watershed (Hydrologic Unit Code 07010103) and Wetland Bank Service Area 5.

5.5.3.1 Regulatory Framework

Wetlands are regulated by state and federal laws, including the Wetland Conservation Act (WCA) (Minnesota Rules Chapter 8420), Minnesota Rules, part 7050.0186, and the Clean Water Act (CWA) Sections 401 and 404. Additionally, wetlands designated as Minnesota Public Waters are subject to the Public Waters Work Permit Rules (Minnesota Rules Chapter 6115).

State and federal wetland regulations require that a permit, approval, and/or certification be issued by the regulatory agency for wetland impacts as defined by the respective regulations. The U.S. Army Corps of Engineers (USACE) St. Paul District is the permitting authority for CWA Section 404 permits; Itasca County SWCD administers the WCA; Public Waters are under the jurisdiction of the MNDNR; and the MPCA has the authority to issue a CWA Section 401 water quality certification on the CWA Section 404 permit.

CWA applies to Waters of the U.S., which includes jurisdictional wetlands and deepwater habitats (i.e., water bodies greater than two meters deep, which are not defined as wetlands), regardless of how the water bodies were created. However, wetlands and other water bodies that are isolated, such as those that do not have a surface water connection to a tributary system to a navigable water of the U.S. or a sufficient connection to interstate commerce other than their use by migratory birds, are not regulated under Section 404 of the CWA (SWANCC decision of 2001).

In contrast, WCA regulates isolated wetlands, but does not regulate wetlands created for a purpose other than to create the wetland (Minnesota Rules, part 8420.0105, subp. 2D). Thus, most, if not all, of the wetlands and other water bodies within the Proposed Project would be regulated through either CWA or WCA. Additionally, all wetlands are regulated by MPCA under Minnesota Rules, part 7050.0185.

5.5.3.2 Existing Conditions

Wetlands are present in varying quantities along the proposed routes. Wetlands were identified within the Proposed Project using National Wetland Inventory (NWI) data developed by the U.S. Fish and Wildlife Service (USFWS). The NWI data was developed starting in the 1970s based on aerial photographs and Natural Resource Conservation Service (NRCS) soil survey maps. Wetlands identified on the NWI maps may not be consistent with current wetland conditions due to land use changes or inaccuracies in the development of the NWI. However, the NWI is the most accurate and readily available dataset to identify wetland resources within the proposed HVTL routes. Wetlands identified by the NWI within the Study Area are presented in Figure 17. The detailed route maps for the proposed HVTL routes display NWI wetlands within each preferred and alternative route (Figures 7, 8, 9, and 10).

In the NWI database, wetlands are classified using the Circular 39 system (Shaw and Fredine, 1971) and the USFWS Cowardin classification system (Cowardin, et al., 1979). The Circular 39 system, which was developed by the USFWS, divides wetlands found in Minnesota into eight types according to differences in depth of water and variety of vegetation. The Cowardin classification system is more detailed, using a tier system to more specifically describe the components of a wetland. For the purposes of this Draft EIS, wetlands are summarized using the Circular 39 system.

Route 1 and 1A

Route 1 contains approximately 499 acres of wetlands (18.6 percent of the route), while Route 1A contains approximately 452 acres of wetlands (19 percent of the route) (Table 5-18).

Table 5-18: Wetlands In Route 1 and Route 1A

	Total Route Area (acres)	Total Wetland Area (acres)	Percent of Route
Route 1	2681.13	498.55	18.6%
Route 1A	2379.47	451.74	19.0%

Table 5-19 lists wetlands in Route 1 and Route 1A by wetland type. The majority of the wetlands in Route 1 and 1A, 89 percent and 81 percent respectively, are Type 6, Type 7, or Type 8. Type 2 wetlands make up 10 percent of Route 1 and 16 percent of Route 1A.

Table 5-19: Wetlands in Route 1 and Route 1A (by Circular 39 Wetland Type)

	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Total Wetland Area (acres)
Route 1	0	50.54	1.7	0.31	0	211.3	150.15	84.55	**498.55**
	0%	**10%**	**0%**	**0%**	**0%**	**42%**	**30%**	**17%**	**100%**
Route 1A	0	74.42	11.86	0.51	2.71	166.59	97.95	97.7	**451.74**
	0%	**16%**	**3%**	**0%**	**1%**	**37%**	**22%**	**22%**	**100%**

Route 2 and 2A

As shown in Table 5-20, Route 2 contains approximately 183 acres of wetlands (18.5 percent of the route) while Route 2A contains approximately 513 acres of wetlands, comprising 20.7 percent of the route.

Table 5-20: Wetlands in Route 2 and 2A

	Total Route Area (acres)	Total Wetland Area (acres)	Percent of Route
Route 2	986.14	182.66	18.5%
Route 2A	2475.35	512.93	20.7%

The majority of the wetlands in both Route 2 and Route 2A are Type 6, Type 7, or Type 8 (Table 5-21). Routes 2 and 2A contain a few acres of Type 3 wetland. Route 2A contains some Type 1, Type 2, and Type 5 wetlands.

Table 5-21: Wetlands in Route 2 and 2A (by Circular 39 Wetland Type)

	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Riverine Systems	Total Wetland Area (acres)
Route 2	0	0	3.76	0	0	31.22	84.87	62.81	0	**182.66**
	0%	**0%**	**2%**	**0%**	**0%**	**17%**	**46%**	**34%**	**0%**	**100%**
Route 2A	13.14	32.07	2.4	0	12.88	191.42	189.83	64.2	6.99	**512.93**
	3%	**6%**	**0%**	**0%**	**3%**	**37%**	**37%**	**13%**	**1%**	**100%**

Route 3 and 3A

Route 3 contains approximately 311 acres of wetlands while Route 3A contains approximately 552 acres of wetlands. Although Route 3A contains more acres of wetlands than Route 3, the percentage of wetlands in each route is identical (See Table 5-22).

Table 5-22: Wetlands in Route 3 and 3A

	Total Route Area (acres)	Total Wetland Area (acres)	Percent of Route
Route 3	2017.15	310.94	15.4%
Route 3A	3577.97	552.26	15.4%

Wetlands found in Routes 3 and 3A are dominated by wetlands of Type 6, Type 7, and Type 8. However, wetlands of Type 2, Type 3, Type 4, and Type 5 are also found in both routes (Table 5-23).

Table 5-23: Wetlands in Route 3 and 3A (by Circular 39 Wetland Type)

	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Municipal and Industrial Activities	Total Wetland Area (acres)
Route 3	0	25.64	54.89	36.27	21.62	80.5	20.89	71.13	0	**310.94**
	0%	**8%**	**18%**	**12%**	**7%**	**26%**	**7%**	**23%**	**0%**	**100%**
Route 3A	0	26.97	7.79	3.26	32.34	215.98	167.71	94.4	3.81	**552.26**
	0%	**5%**	**1%**	**1%**	**6%**	**39%**	**30%**	**17%**	**1%**	**100%**

Route 4 and 4A

Approximately 20.69 acres of wetlands comprise three percent of Route 4, while 110.41 acres of wetlands comprise 13.5 percent of Route 4A (See Table 5-24).

Table 5-24: Wetlands in Route 4 and 4A

	Total Route Area (acres)	Total Wetland Area (acres)	Percent of Route
Route 4	691.85	20.69	3.0%
Route 4A	819.85	110.41	13.5%

As shown in Table 5-25, wetlands in Route 4 and 4A are comprised nearly entirely of Type 6, Type 7, and Type 8 basins with a smaller amount of Type 2, Type 3, and Type 4 basins also present.

Table 5-25: Wetlands in Route 4 and 4A (by Circular 39 Wetland Type)

Route	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Municipal and Industrial Activities	Total Wetland Area (acres)
Route 4	0	0	0.28	3.26	0	1.55	15.6	0	0	**20.69**
	0%	**0%**	**1%**	**16%**	**0%**	**7%**	**75%**	**0%**	**0%**	**100%**
Route 4A	0	0.79	1.38	0	0	14.97	93.27	0	0	**110.41**
	0%	**1%**	**1%**	**0%**	**0%**	**14%**	**84%**	**0%**	**0%**	**100%**

5.5.4 Flora and Fauna

The Proposed Project would result in physical alterations of the landscape in the Project Area as HVTLs and substations are constructed and maintained. The physical alterations related to the Proposed Project would consist of vegetation clearing and structure placement within the established ROW of the HVTL. Constructing HVTL structures and alterations of vegetation could result in general impacts to wildlife and fisheries habitat or to the individual plant and animal species present in the Project Area. A description of the existing vegetation, wildlife and fisheries resources in the Project Area is provided.

5.5.4.1 Vegetation

The Study Area is located in the Laurentian Mixed Forest province, which extends across northeastern Minnesota, as well as northern Wisconsin, northern Michigan and southern Ontario (MNDNR, 2003). In Minnesota this province is generally characterized by broad areas of forests, including conifer forests, mixed conifer hardwood forests, and conifer bogs and swamps. This province covers more than 23 million acres across Minnesota and contains four major ecological sections and 13 subsections. The Study Area is located partly within the Nashwauk Uplands ecological subsection and partyl within the St. Louis Moraines subsection. Both subsections lie within the Northern Superior Forests ecological section. The Nashwauk Uplands subsection includes rolling till plains and moraines and flat outwash plains. Bedrock is locally exposed in areas and small bogs and pothole wetlands are common (MNDNR, 2003). The vegetation communities within this subsection traditionally consisted of white pine, red pine, balsam fir, white spruce and aspen-birch. The St. Louis Moraines subsection includes rolling to steep slopes, with end moraines (MNDNR, 2003). The vegetation in this subsection consisted of hardwood forests in the southern half of the subsection and conifer forests in the northern half of the subsection.

This region of Minnesota has been heavily impacted by mining and logging over the last 100 years. As a result the vegetation communities have shifted towards early successional species that colonize disturbed areas, consisting mainly of aspen-white birch forests, grasslands and mixed shrublands. The National Agricultural Statistics Service (NASS) land cover data (2008) was used for the review of the existing land cover and vegetation communities within the proposed HVTL routes (Figure 18). The NASS data attributes provided sufficient detail in the land cover classifications for the analysis required for this Draft EIS. The NASS data set is also the most recently updated of the land cover data sets available for the Study Area. The total acres of each land cover category in each of the proposed HVTL routes is presented in Table 5-26.

Table 5-26: Land Cover Information for the Proposed HVTL Routes

Land Cover Class(1)	Route 1	Route 1A	Route 2	Route 2A	Route 3	Route 3A	Route 4	Route 4A	Total
Deciduous Forest	1,459.6	1,313.6	722.7	1,601.0	745.1	2,493.5	333.7	526.9	9,196.3
Developed	195.8	149.6	8.2	134.5	186.4	147.5	34.4	39.7	896.1
Evergreen Forest	350.9	356.4	89.1	81.2	311.8	290.4	155.9	139.0	1,774.7
Grassland	40.6	20.5	14.0	17.8	56.5	54.5	17.0	13.9	234.7
Herbaceous Wetlands(1)	66.3	64.5	25.1	268.0	188.7	84.2	5.8	15.3	717.9
Open Water	9.3	6.0	0.6	29.8	97.1	34.7	2.3	0	179.8
Pasture/Hay/Crop	322.1	263.3	10.2	213.7	83.1	199.6	17.8	18.1	1,127.9
Shrubland	230.7	202.5	15.0	65.8	286.3	187.2	125.0	66.2	1,178.7
Woody Wetlands(1)	5.7	3.1	101.3	63.5	62.0	86.4	0	0.8	322.7
Total	**2,681.1**	**2,379.5**	**986.1**	**2,475.4**	**2,017.1**	**3,578.0**	**691.9**	**819.9**	**15,628.9**

(1) : wetland totals presented are based on the NASS 2008 data set and do not match the NWI data set used for wetland analysis in Section 5.5.3.

The land cover within the Proposed Project is dominated by a variety of forest communities, comprising approximately seventy percent of all lands within the proposed HVTL routes. Deciduous forests are the most abundant forest type within the proposed HVTL routes. Individual species within the deciduous forests include aspen, white birch, bur oak, white oak, red oak and black ash. The other major forest community is evergreen forests. Common species present within the evergreen forests include red cedar, black spruce, white pine, red pine, balsam fir and white cedar. Shrublands comprised the next largest land cover type within the proposed HVTL routes, followed by agricultural lands, wetlands and developed lands. The wetland communities within the Proposed Project identified by the NASS dataset are divided into two main groups; herbaceous wetlands that include sedge meadows or shallow marshes, and woody wetlands that include tamarack swamps. The NASS wetland communities do not match the NWI wetland communities used for wetlands analysis in Section 5.5.3. As a result, the wetland totals for the proposed HVTL routes presented in Table 5-26 do not match the wetland analysis using the NWI dataset in Section 5.5.3. Both the NASS and NWI datasets use interpretation of aerial photographs to develop attributes, but the NWI dataset uses finer resolution that specifically targets the delineation of wetland communities. As a result the NWI data produces a more comprehensive level of wetland detail than is provided by the NASS data. The NWI dataset was used for all wetland analysis within this Draft EIS.

5.5.4.2 Wildlife

The wildlife community within a region is influenced by the habitat conditions including vegetation communities, hydrological features (i.e., lake, river and wetlands) and climate. As a result, the wildlife community in the Study Area consists of species that are adapted to the local habitat conditions, including a landscape that is dominated by forest communities, bogs, swamps and

glacial lakes typically connected by rivers and streams. Wildlife species in northern Minnesota must also be adapted to relatively short growing seasons and long winter seasons with extended periods of snow coverage. Wildlife within the Study Area utilize different habitats for different phases of their life cycles including resting, feeding, nesting and breeding. Habitats in northern Minnesota support both local and migratory wildlife populations.

A variety of mammal, bird, reptile and amphibian species exist within Itasca County and the Study Area. Large mammals in the Study Area may include whitetail deer, moose or black bear. These species are associated with forest habitats but these animals have large home ranges and may also utilize wetland or grassland habitats. Numerous small mammals are associated with forest habitats in northern Minnesota and are likely found in the Study Area including timber wolves, coyotes, red fox, raccoon, pine marten, mink, snowshoe hare and red squirrel as well as bats, mice, shrews or voles. Wetland areas provide habitats for mammals such as beavers, as well as amphibians and reptiles including frogs, toads, salamanders, snakes and turtles. A wide variety of birds are found in northern Minnesota, and may be present in the Study Area, including ruffed grouse, great blue heron, bald eagle, osprey, common snipe, and waterfowl as well as species of hawks, owls, woodpeckers and a variety of passerine species.

5.5.4.3 Fisheries

There are numerous lakes, rivers and streams within the Study Area. The majority of these water bodies in the Study Area support a fish population that includes a mix of game fish sought by anglers as well as non-game species. The MNDNR is responsible for managing and monitoring fisheries resources in Minnesota. However, the MPCA also conducts monitoring activities to assess the health of the fish communities. According to the MNDNR Lakefinder website (http://www.dnr.state.mn.us/lakefind/index.html) lakes in the Study Area are known to contain the following game fish species: black crappie, bluegill, largemouth bass, northern pike, pumpkinseed sunfish, rock bass, walleye, and yellow perch. Non-game species known to occur in lakes in the Study Area include bigmouth buffalo, black bullhead, bowfin, brown bullhead, common carp, golden shiner, silver redhorse, shorthead redhorse, white sucker and yellow bullhead.

The lakes in the Study Area are often interconnected, either by the main rivers, such as the Swan River or Prairie River, or by small streams and creeks. As a result many of the species known to occur within lakes in the Study Area are also found within the rivers and streams. Review of the MPCA Electronic Data Access website (http://www.pca.state.mn.us/data/eda/search.cfm) revealed that the Prairie River is the only river in the Study Area where biological monitoring information is available for the fish community. Results of the MPCA fish community survey of the Prairie River indicate that game species known to occur in the Prairie River include black crappie, largemouth bass, northern pike, pumpkinseed sunfish, rock bass, smallmouth bass, walleye and yellow perch. Non-game species found in the Prairie River include blacknose dace, brassy minnow, common shiner, creek chub, hornyhead chub, johnny darter, logperch, spotfin shiner, tadpole madtom and white sucker.

Pickerel Creek, a tributary to Swan Lake located directly south of the city of Nashwauk, is the only MNDNR designated trout stream in the Study Area. Pickerel Creek currently supports a population of brook trout but past mining activities in the region have altered the stream and limited the fish community within the stream. In addition to brook trout, fish species collected in Pickerel Creek in past MNDNR surveys include bigmouth shiner, brook stickleback, central mudminnow, creek chub, fathead minnow, longnose dace, northern pike, northern redbelly dace, sand shiner and white sucker. The MNDNR stream management plan for Pickerel Creek indicates that the stream receives a limited amount of angling activity but that there are places for the public to access the stream, mainly in the upper reaches where public access has generally been by allowed by Blanding Paper. Long term management concerns for Pickerel Creek are to examine the impact of beaver dams on

habitat within the stream, identify potential habitat improvement projects for the stream and monitoring the progress and potential impacts of mining projects in the watershed.

The lakes in the Study Area support varying amounts of recreational activity based on the size and types of the game fish populations as well as availability of public access points. The MNDNR designated public access points in the Study Area are displayed on Figures 16. Large lakes in the Study Area, such as Swan Lake, have multiple access points and support a high amount of regional recreation angling activities during both the open water and ice fishing seasons. Smaller basins, such as Dunning Lake or Big Diamond Lake, do not have designated public access points and mainly receive angling or recreational activity from lake shore residents. In some cases it may be possible for anglers to access a lake without a designated public access point because the lake is connected to another lake or stream where an access point is present. The MNDNR does not have designated public access points along the major rivers and streams in the Study Area. However, it is possible for anglers to access rivers and streams connected to lakes with access points or at public road crossings.

5.5.5 Rare and Unique Natural Resources/Critical Habitat

In this section of the Draft EIS, information was reviewed to identify rare and unique natural resources and critical habitats that may potentially be present in the vicinity of the Proposed Project. This section also identifies state and federally threatened and endangered species and state species of special concern that may be present within the Study Area.

5.5.5.1 Regulatory Framework

The Federal Endangered Species Act of 1973, as amended (16 U.S.C. §§ 1531 – 1544) defines the regulations pertaining to plant and animal species that have been federally-designated as threatened or endangered.

Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) requires the MNDNR to adopt rules designating species meeting the statutory definitions of endangered, threatened, or species of special concern. The resulting list of Endangered, Threatened, and Special Concern Species is codified as Minnesota Rules Chapter 6134. The Endangered Species Statute also authorizes the MNDNR to adopt rules that regulate treatment of species designated as endangered and threatened. These regulations are codified as Minnesota Rules, parts 6212.1800 to 6212.2300.

Minnesota's Endangered Species Statute and the associated rules impose a variety of restrictions, a permit program, and several exemptions pertaining to species designated as endangered or threatened. Species of special concern are not protected by Minnesota's Endangered Species Statute or the associated rules.

The rules prohibit taking an endangered or threatened species without a permit. Rules specify that a Takings Permit may be issued only for scientific study, for educational programs, to enhance propagation or survival of the species, to prevent injury to people or property, or when the social and economic benefit of the taking outweigh the harm caused by it.

5.5.5.2 Existing Conditions

Data from several sources was reviewed to identify the rare and unique natural resources and critical habitat in the Study Area. The Minnesota County Biological Survey (MCBS) collects information on the distribution of rare plants and animals and native plant communities in the state. However, data from surveys in Itasca County not been compiled and MCBS data is not available for review for the Study Area. The MNDNR has established the Scientific and Natural Area (SNA) program to preserve and protect sites that contain unique natural attributes and rare resources.

SNAs often contain features such as undisturbed native plant communities or rare or endangered species' habitat. There are no SNAs identified in the vicinity of the Study Area.

The MNDNR has also identified animal species whose populations are rare, declining, or vulnerable in Minnesota as Species in Greatest Conservation Need (SGCN). These species may or may not be federally or state listed. The list of SGCN is found in Appendix G of the Route Permit Application. Identification of favorable habitats associated with SCGN can also be found in the Route Permit Application.

The Natural Heritage Information System (NHIS) provides information on rare plants, animals, native plant communities, and other rare features and is the most complete source of data on Minnesota's rare or unique species and natural features. The initial search of the NHIS database was conducted by the Applicants in April 2009. The NHIS database search did not return any records of federally-listed threatened or endangered species in the Study Area. Additionally, the database search did not identify any state-listed species within the boundaries of the Proposed Project. However, the database search identified populations of state-listed threatened, endangered, and special concern plant and animal species in the Study Area. The general locations of the species identified in the NHIS database are shown in Figure 19. The actual locations of threatened or endangered species can not be identified under the rules of NHIS data to protect these rare and unique resources from accidental or intentional exploitation. Species listed as special concern by the MNDNR are not offered the same level of protection or regulation as species listed as threatened or endangered under state rules.

Plants

The NHIS database identified one state-listed threatened species and three state-listed endangered plant species in the vicinity of the Proposed Project. The database search also identified nine species that were listed as species of special concern. Table 5-27 identifies listed species, as well as their respective state status.

Table 5-27: NHIS Database Records of Plant Species in Vicinity of Proposed Project

Scientific Name	Common Name	State Status
Botrychium oneidense	Blunt-lobed Grapefern	Endangered
Botrychium pallidum	Pale Moonwort	Endangered
Platanthera flava var. herbiola	Tubercled Rein-orchid	Endangered
Botrychium rugulosum	St. Lawrence Grapefern	Threatened
Botrychium campestre	Prairie Moonwort	Special Concern
Botrychium minganense	Mingan Moonwort	Special Concern
Botrychium simplex	Least Moonwort	Special Concern
Littorella uniflora	American Shore-plantain	Special Concern
Najas gracillima	Thread-like Naiad	Special Concern
Platanthera clavellata	Club-spur Orchid	Special Concern
Ranunculus lapponicus	Lapland Buttercup	Special Concern
Sparganium glomeratum	Clustered Bur-reed	Special Concern
Torreyochloa pallida	Torrey's Manna-grass	Special Concern

Animals

Three animal species listed as special concern were identified in the Project Area by the NHIS database search (see Table 5-28).

Table 5-28: NHIS Database Records of Plant Species in Vicinity of Proposed Project

Scientific Name	Common Name	State Status
Lasmigona compressa	Creek Heelsplitter	Special Concern
Ligumia recta	Black Sandshell	Special Concern
Haliaeetus leucocephalus	Bald Eagle	Special Concern

The bald eagle is currently listed as a species of special concern in Minnesota. The bald eagle was removed from the Federal Endangered Species list in 2007, due to population increases across the U.S. that are the result a decrease of dichlorodiphenyltrichloroethane (DDT) in the environment. The bald eagle is still protected today by the Bald Eagle and Golden Eagle Protection Act and the Migratory Bird Treaty Act, largely due to its importance as a national symbol.

The creek heelsplitter and black sandshell are mussel species listed as a species of special concern identified by the database search in the Study Area. The two mussel species were listed as a special concern species in 1996 due to a decline in populations and degradation of its habitat.

While there were no occurrences identified by the NHIS database search, the Proposed Project is also located within the range of the federally threatened gray wolf and federally threatened Canada lynx.

The status of the gray wolf has changed multiple times over the last three years based on the identification distinct populations in different regions of the U.S. and health of those populations and also a law suit filed against the USFWS for removal of identified populations of the gray wolf from the federal endangered species list. The USFWS identified a distinct population segment of the gray wolf termed the Western Great Lakes Population, which includes all of Minnesota. The Western Great Lakes Population of gray wolves was removed from the federal endangered species list in February 2007 and then added back to the list in September 2008 based on a U.S. District Court ruling. In April 2009 the Western Great Lakes population of gray wolves was again removed from the federal list but a ruling on July 1, 2009 withdrew the delisting to allow for adequate public comment on the USFWS plan to delist the gray wolf. As a result Western Great Lakes Population of gray wolves is currently listed as a federally threatened species. Although the Proposed Project is located outside of areas designated as critical habitat for the species, due to the typically large home ranges of wolf packs, it is possible that gray wolves are at times present in the Study Area.

The Canada lynx (lynx) was added to the federal endangered species list in 2000 as threatened for several states in the Northeast and Great Lakes Region, including Minnesota. Currently, the lynx is offered no special status under Minnesota Endangered Species Statue. Critical habitat has been designated by the USFWS on two occasions for areas in Minnesota, with both locations being located to the northeast within 100 miles of the Proposed Project. While lynx likely do not reside in the Study Area, it is possible, due to their mobility and large home range, they may travel through the area.

6.0 Environmental Impacts and Mitigation

Chapter 6 provides analysis and discussion on the potential impacts from the Proposed Project. Specifically, potential impacts within the Project Impact Area (i.e., 130 foot ROW for each proposed HVTL alignment) and the Advisory Task Force (ATF) alignments were analyzed for this Draft EIS. The purpose of the ATF was to determine impacts and issues for inclusion in the EIS and to review and identify alternatives to the proposed HVTL routes. The ATF used two categories of potential impacts and issues: Future Use of Land and Other Issues. The ATF determined that impacts to real property were the top priority, and route impacts were the second priority in the Future Use of Land category. Potential health and safety issues were the top priority and potential environmental impacts the second priority in the Other Issues category. These potential impacts were carried forward for analysis in this Draft EIS.

The ATF identified five alignments and three alternative routes for the Proposed Project that were outlined in the ATF Report (Appendix B). ATF *alignments* are those portions of a proposed HVTL alignment that were shifted slightly *within* a proposed route to avoid ATF identified impacts, such as a residence or a future development site. ATF *alternative routes* are those portions of a proposed HVTL alignment that were shifted *outside* of a proposed route to avoid ATF identified impacts.

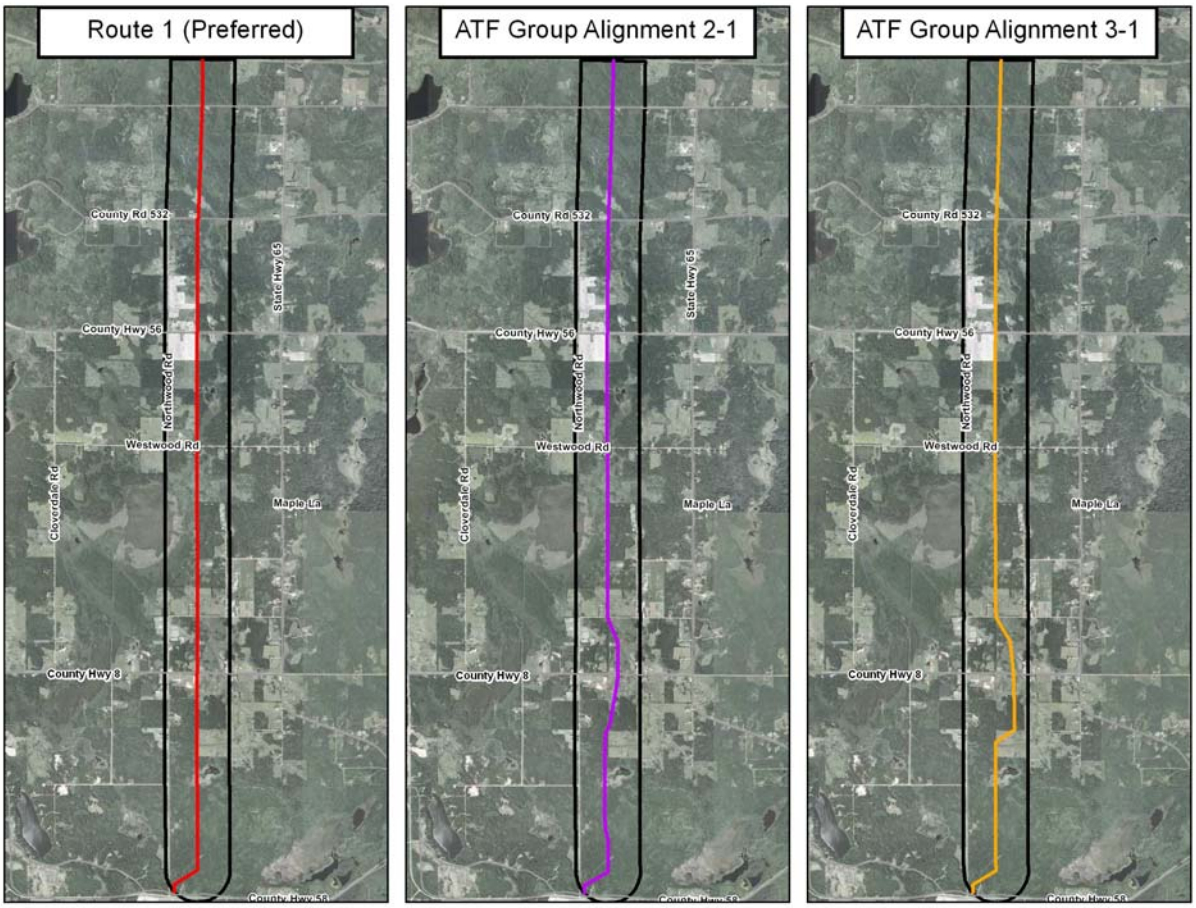
For the purposes of this Draft EIS, the alignments and segments identified by the ATF are referred to as alignments and have been labeled based on the ATF Group number and corresponding proposed route number (e.g., ATF Alignment 2-1). Table 6-1 provides a list of the ATF alignments and the associated proposed routes.

Table 6-1: ATF Alignments

Route	ATF Alternative	ATF Alignment Label in EIS
1	ATF Group 2 alignment	ATF Alignment 2-1
1	ATF Group 3 alignment	ATF Alignment 3-1
1A	ATF Alt. Route Segment 3	ATF Alignment 3-1A
2	ATF Group 2 alignment	ATF Alignment 2-2
2	ATF Group 3 alignment	ATF Alignment 3-2
3	ATF Group 2 alignment	ATF Alignment 2-3
3A	ATF Alt. Route Segment 1	ATF Alignment 2-3A
3A	ATF Alt. Route Segment 2	ATF Alignment All-3A

The ATF alignments were analyzed as an extension of the preferred or alternative route alignment. For example, the analysis for Route 1 examined three possible HVTL alignments to determine potential impacts, as shown in Illustration 6-1. This was necessary for comparison of potential impacts between the different alignments. The differences between alignments could include potential impacts to the number of houses near the alignment or the number of stream crossings for each alignment.

Illustration 6-1: Examples of Route Alignments Analyzed in Draft EIS



The focus of the impacts analysis in chapter 6 is the 130 foot ROW (i.e., HVTL alignment width) for each route. Each main section of the chapter analyzes and compares potential impacts from the preferred route HVTL alignment to the alternative route HVTL alignment. If a route has an ATF alignment associated with it that is also analyzed and compared to the other alignments within that route. The analysis examines potential impacts of the preferred, alternative, and ATF alignments to the topics previously described in chapter 5 for the background and affected environment information. The main topic areas include human settlement, land-based economics, and the natural environment. Each of the proposed substations was also analyzed for potential impacts in those topic areas. Mitigation measures are provided following each of the impacts discussions for each of the topics. Chapter 6 also provides information on the routes considered and rejected by the Applicants.

6.1 SHANNON END OF 94 LINE TO ESSAR STEEL PLANT SUBSTATION – ROUTE 1 AND ROUTE 1A

Route 1 and Route 1A would supply power to Essar Steel from the Shannon substation (Figure 7). Both Route 1 and 1A would begin at the existing 94 Line, which is a 230 kV HVTL running between the Shannon substation and the Boswell substation. The routes defined by the Applicants are wide enough to allow for shifting of the preliminary alignment within the routes to avoid impacts to residences or sensitive resources. Additionally, ATF alignments have also been identified, which give further consideration to residences and other factors.

6.1.1 Human Settlement

Background information on human settlement, which described existing conditions related to development patterns and the community, was provided in chapter 5. This section of the Draft EIS provides information on the potential impacts to human settlement from construction and operation of the Proposed Project, including proximity to structures and potential displacement; property values; aesthetics; noise; interference to radio, television, internet or cellular phones; and public health and human safety related to electric and magnetic fields, implantable medical devices, and stray voltage. Mitigation measures for each of the topic areas are also provided.

6.1.1.1 Proximity to Structures and Displacement

Displacement occurs when a residence is located at a distance that would interfere with the safe operation of a transmission line. HVTL projects have the potential to result in displacement depending on project area conditions and densities of commercial or residential properties within an HVTL route. Utilities typically do not allow residences or businesses within the final ROW easement.

Displacement results during ROW acquisitions where property currently occupied by a residence or business is required for the HVTL ROW. Typically the Applicants would request an easement to use a narrow strip of land within a property. However, ROW acquisition is regulated by Minnesota Statutes Section 216E.12, subd.4. This statute gives a property owner the option to require the Applicants to purchase an entire property, which is crossed by an HVTL, at fair market value. Eligibility to exercise this right depends on property classification under Minnesota Statute Section 273.13 and capacity ($\geq$ 200 kV) of the HVTL.

Impacts

The Applicants provided a dataset identifying residences in the Study Area. Residences were identified through field observation/confirmation, analysis of high resolution aerial photography, and discussions with the public by the Applicants. The residences within the proposed 130 foot ROW for Routes 1 and 1A were identified using the dataset provided by the Applicants. The number of homes within 500 feet of the proposed route centerlines was also examined. Table 6-2 summarizes the results of this analysis.

Table 6-2: Number of Residences Proximate to Proposed Alignment

Route		Within 130' ROW	Within 500' of Centerline
1	Proposed	0	4
	ATF Alignment 2-1	0	4
	ATF Alignment 3-1	0	3
1A	Proposed	0	7
	ATF Alignment 3-1A	0	5

Additional residences were identified by the public and ATF following submittal of the Route Permit Application. ATF Alignment 2-1 would shift the southern portion of the proposed Route 1 alignment to the east, where it would cross a lowland area, and than shift it to the east in order to avoid an existing residence. However, ATF Alignment 2-1 would not reduce the number of residences in proximity to the proposed HVTL. ATF Alignment 3-1 would follow the same shift east as 2-1 and then shift even farther to the east to avoid the same home. ATF Alignment 3-1

would reduce the number of homes within proximity to the proposed HVTL ROW by one. ATF Alignment 3-1A would shift the proposed Route 1A alignment to the northwest. This shift would move the proposed HVTL away from a future building site and would also reduce the number of homes in proximity to the HVTL ROW by two.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid displacement. The construction of Route 1 or Route 1A is not anticipated to cause displacement of residences or businesses. The Applicants' final ROW alignment and structure locations would maximize the distance of the HVTL from homes and commercial buildings to the extent practical.

6.1.1.2 Property Values

During scoping for this Draft EIS, concerns were raised regarding whether the Proposed Project would have a negative impact on property values. As previously discussed in chapter 5, property values are dependant on a number of factors, and therefore, it can be difficult to determine the affect one factor may have on the value of a given property. There have been a number of studies completed that examined whether HVTLs have an impact on property values. A brief summary of selected studies are provided in the following paragraphs.

Research Examining HVTL Impacts on Property Values

Research completed for the Edison Electric Institute Siting and Environmental Planning Task Force reviewed numerous studies on property values related to transmission lines. These studies included appraiser studies, attitudinal studies, and statistical analyses. None of the studies reviewed during this research provided conclusive findings which could isolate the impacts of transmission lines on property values. The studies reviewed indicated that there is potential for transmission lines to reduce the sales prices of a residential or agricultural property by zero to ten percent (Kroll and Priestley, 1992). However, the studies indicated that a greater impact on property values is related to other factors, such as the condition and size of the property, and neighborhood perceptions by potential buyers. The research also found that impacts would likely be greatest immediately following construction of a new line and would diminish over time.

Property values are dependant on a number of factors including market conditions, location, and buyer's personal perspective.

A study related to property values completed by St. Cloud State University in 1998 was reviewed for this Draft EIS. In this study, surveys were used to gather perceptions from buyers, sellers, and residential appraisers regarding the impact of HVTLs on residential property values. A total of 190 surveys were received. Based on survey responses, the study found that an estimated decrease in property values ranged between 3.3 percent and 7.6 percent for homes on or near an HVTL (Mitteness and Mooney, 1998). Additionally, findings indicated that the sale of a property on an HVTL would take an additional 62 days, on average. (NOTE: The study findings are based on data and market trends in 1998. The sale and value of a property is dependent on the overall housing market at the time of sale as well as many other factors, such as location and condition of a property.)

A study completed by Hamilton and Schwann analyzed existing research and data along with their own research on the effects of HVTLs on single detached housing values. This study concluded that HVTLs have an effect on property values, but that effects are restricted to a

narrow band and are primarily due to visual impacts of the HVTL towers. Existing literature used for this study finds that properties adjacent to or within 200 meters (656 feet) of a visible transmission line experience a greater potential impact on property value. Properties adjacent to a line lose 6.3 percent of their value due to proximity and visual impact. Properties more distant from HVTLs are significantly less affected, losing roughly one percent of their value (Hamilton and Schwann, 1995). The study also found that builders/developers of properties located adjacent to or near HVTLs have tried to mitigate for potential visual impacts by reconfiguring lots and reorienting homes.

Two additional studies (Pitts and Jackson, 2007, and Elliott and Wadley, 2002) regarding the effect that HVTLs may have on property values were also examined for this Draft EIS. These studies had similar conclusions as other studies in that it is difficult to measure the impact HVTLs have on property values. An HVTL's proximity to structures influences its potential impact. However, study results have been varied and inconclusive. The main reason for these inconclusive findings are due to the many external factors that play a role in determining a property's value, which include market conditions, location and a buyer's personal preference.

Using the information from the various studies examined for this Draft EIS, potential impacts were determined for each route. One study used 200 meters (656 feet) within a visible line as a benchmark for potential impacts. For this Draft EIS, 500 feet from the proposed HVTL alignment was used to determine if there could be a potential impact.

GIS analysis was conducted to determine where homes within 500 feet of the proposed HVTL alignment occur for the Proposed Project. The GIS analysis did not take into account vegetation and topography that would potentially provide visual screening to residences. It strictly used a straight line to measure from the proposed HVTL alignment (130 foot ROW) to residences within 500 feet. The findings of this analysis are described in section 5.3.2 and also provided relative to displacement and proximity to structures in section 6.1.1.1.

The Draft EIS can not provide conclusive data on whether the Proposed Project would impact property values and to what degree those impacts may be. The Draft EIS has provided some information from existing literature that discusses the topic of HVTLs and the effects on property values. This Draft EIS has also provided information on the location and proximity the proposed HVTL alignment would be to existing residences, which can be used to assess which residences have a greater potential to experience property value impacts from the Proposed Project. Residences closest to a new HVTL would likely experience the greatest potential for impacts to property values compared to residences further away or located near an existing HVTL. However, it is unknown what effect the Proposed Project would have on an individual's property value.

Impacts

Route 1 would establish a new HVTL route. There are 29 houses located within this route. Four houses are within 500 feet of the proposed HVTL alignment for Route 1. There are four houses within 500 feet of ATF Alignment 2-1 and three houses within 500 feet of AFT Alignment 3-1. Route 1A would be constructed within a new HVTL route. There are 23 houses located within this route. Seven houses are within 500 feet of the proposed HVTL alignment for Route 1A. There are five houses within 500 feet of ATF Alignment 3-1A.

Houses within 500 feet of the proposed HVTL alignment have the greatest potential to experience impacts on property values. In both instances, a new HVTL route would be created in an area that

does currently have an HVTL. Route 1A has more houses within 500 feet of the proposed HVTL alignment than Route 1.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid residences as much as possible. The Applicants' final ROW alignment and structure locations would strive to maximize the distance of the HVTL from homes and commercial buildings.

6.1.1.3 Aesthetics

The measure of an aesthetic impact is dependent on the perception or response of an individual viewer. The Route Permit Application explains that an individual viewer's sensitivity relates to their concern for a particular viewshed. Three levels of sensitivity were used to identify potential impact areas in the Route Permit Application and are described as follows:

- Low Visual Sensitivity – motorists viewing transmission lines from the perspective of the roads they traverse

- Moderate Visual Sensitivity – recreational users, such as bird watchers, hikers, hunters and other individuals whose activity is specific to and who are sensitive to a finite geographic location, and who are sensitive to man-made structures and their impact on the natural environment

- High Visual Sensitivity – residential viewers who own property within 500 feet of the proposed route alignments and are concerned about the structures and how they impact the view of the natural environment

In forested areas, new HVTL alignments would require land clearing for a ROW of up to 130 wide, which would create a linear landscape feature. In other cases, the proposed HVTL alignment would follow existing road ROW and existing transmission line ROW. In areas where new HVTL ROW would be created, impacts to aesthetics have the potential to be greater, especially to areas such as parks, stream crossings or residences, for example. The extent of aesthetic impacts on an individual property owner is dependant on a number of factors. These include a property owner's personal perception of the HVTL, visual screening of the HVTL (e. g., vegetation or topography blocking the view from the residence), distance the residence is from the HVTL, and whether the HVTL uses an existing transmission line or other existing ROW.

Distance and visual screening by vegetation or topography all influence the potential for aesthetic impacts of new and existing HVTLs.

Residences closest to a new HVTL would likely experience the greatest potential for aesthetic impacts compared to residences further away or located near an existing HVTL. Based on a dataset of known residences located by the Applicants, a GIS analysis was conducted to determine where homes within 500 feet of the proposed HVTL alignment occur for the Proposed Project. The GIS analysis did not take into account vegetation and topography that would potentially provide visual screening to residences. It strictly used a straight line to measure from the proposed HVTL alignment centerline to residences within 500 feet of that centerline. The findings of this analysis are described in section 5.3.1 and are also provided relative to displacement and proximity to structures in section 6.1.1.1. For this Draft EIS and the Route

Permit Application, 500 feet from the proposed HVTL alignment was used to determine if there would be a potential impact. Additionally, the Route Permit Application identified residences within 500 to 1,000 feet from the proposed HVTL alignment that could view the transmission line through a forest opening.

Impacts

The proposed HVTL alignment in Route 1 would create a new visual impact to houses within that route. There are four houses located within 500 feet of the proposed HVTL alignment for Route 1. Additionally, according to the Route Permit Application there are eight homes located 500 to 1,000 feet from the proposed Route 1 HVTL alignment that could have a view through forest openings.

There are four houses in ATF Alignment 2-1 and three houses in ATF Alignment 3-1 within 500 feet of those alignments, which include houses in the remaining portion of Route 1. In either case, construction of an HVTL would be a new visual impact to residences within view of it. Using ATF Alignment 2-1 would not change the number of potentially impacted houses, while using ATF Alignment 3-1 would reduce the number of potentially impacted houses by one compared to the proposed Route 1 HVTL alignment.

A new visual impact would be created by the proposed HVTL for Route 1A. Seven houses are within 500 feet of the centerline of the proposed HVTL alignment. There are two additional houses located 500 to 1,000 feet from the proposed in Route 1A HVTL alignment that were identified in the Route Permit Application as having a forest opening to view the Proposed Project. Additionally, there are five houses within 500 feet of ATF Alignment 3-1A. This alignment would reduce the number of potentially impacted houses by two, compared to the proposed Route 1A HVTL alignment.

Approximately one mile north of the Essar Steel Plant substation, the Lawron Snowmobile Trail would cross perpendicular to the proposed HVTL alignments for Route 1 and 1A. The proposed HVTL alignment would create a 130 foot cleared ROW that a snowmobiler would cross briefly while using the trail.

As described in section 6.1.3.2, Route 1, Route 1A, and ATF alternative alignments would result in new stream utility crossings. These have the potential to create visual and aesthetic impacts to the stream corridor.

Mitigation

In addition to working with property owners and public agencies to identify concerns related to the proposed HVTL and aesthetics, the Applicants described a number of other potential mitigation measures in the Route Permit Application. These included the following for Route 1, Route 1A, and ATF alignments.

- Where feasible, the location of pole structures, ROW, and other disturbed areas would be determined by considering input from property owners or land management agencies to minimize visual impacts.

- Structure types (designs) would be uniform to the extent practical. The Applicants propose to use wooden H-frame structures which are wider and utilize two poles rather than steel poles structures which are taller than H-frame structures. The H-frame structures are between 60

and 90 feet in height. The wood poles are considered less intrusive in a rural forested landscape.

- The Applicants propose to minimize natural landscape disturbance as possible; construction and operation would be conducted to prevent unnecessary destruction, scarring or defacing of the natural surroundings.
- As possible, waterways would be crossed in the same location as existing linear structures, such as utility lines or transportation ROW.
- In small sections, Route 1 and Route 1A would parallel existing road ROW to minimize visual impacts to open space.
- Existing vegetation would be used to screen the transmission lines from areas of high visual sensitivity, where feasible.

6.1.1.4 Noise

HVTLs can produce audible sound from transmission line conductors, which can generate electromagnetic noise known as corona. This noise, corona, is typically only loud enough to be heard in close proximity to the transmission lines.

The Applicants modeled conductor noise for each possible structure design configuration: H-frame, single-pole, and single-pole 230/115 kV double circuit structures. Single circuit configurations were modeled as stand-alone structures and alongside existing 115 kV transmission lines where appropriate. The MPCA noise standards were used to ensure compliance for all design and route combinations.

Impacts

The level of noise produced by the transmission line conductors depends on conductor conditions, voltage level, and weather. Noise is greatest during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, transmission lines can create a faint crackling sound, which is caused by corona. Heavy rains tend to mask the crackling sound, blending it into the background noise.

> According to modeling results, noise levels would be less than 20 dBA (i.e. noise level of a whisper) at the edge of the ROW during fair weather conditions.

The noise modeling completed by the Applicants determined that the Proposed Project would be almost inaudible. According to modeling results, noise levels would be less than 20 dBA (i.e., noise level of a whisper) at the edge of the ROW during fair weather conditions. Under wet conditions, the maximum L_5 noise level (i.e., noise level exceeded 5 percent of the time) directly under the transmission line is less than 50 dBA (i.e., noise level of a library), which is below the most restrictive permissible noise level for NAC (1) (see Table 5-9).

The further from the HVTL, the less likely noise would be heard. Residences located at the edge of the ROW would experience noise levels less than 20 dBA that may or may not be audible, therefore would cause minimal to no impacts. Residences located beyond the edge of the ROW would likely not notice audible noise from the proposed HVTL.

There are no houses located within the ROW of the proposed HVTL alignment for Routes 1 and 1A. Therefore, no impacts from noise are anticipated.

Mitigation

The Applicants have indicated that transmission line equipment would be maintained in good working order, which would help minimize the occurrence of corona. Noise associated with the operation of the Proposed Project would not require mitigation.

6.1.1.5 Interference

As discussed in chapter 5, communication devices can be affected by an HVTL system through interference of the electromagnetic energy emitted at various frequencies by communication devices or their antennae. The Proposed Project has the potential to impact electronic communication (i.e., omnidirectional and unidirectional signals) within the Study Area. Potential impacts from interference with communication and mitigation measures for those impacts are discussed in the following sections.

Impacts

Omnidirectional communication signals may be impacted by the proposed HVTL from gap discharges, corona discharges, and shadowing and reflection. The potential for gap discharges leading to interference from either proposed Route 1 or Route 1A is minimal. Due to the high frequencies of television signals, a 230 kV line seldom causes reception problems from corona discharges. The potential for shadowing and reflection from the proposed transmission line system is minimal due to the structure types, height, and spacing. There is 19.5 feet between each structure pole, approximately 800 feet between each structure, and structure heights are similar to the trees of the surrounding landscape, and therefore the HVTL system is not anticipated to block communication signals.

Unidirectional communication signals, such as those utilized by microwave towers, may be impacted by the proposed HVTL if the line of site is interrupted. However, no direct or indirect impacts to unidirectional signals are anticipated as microwave towers are taller than the proposed structures.

As discussed in Section 5.3.5, no impacts to FM radio, satellite television, cellular phones, or wireless internet are anticipated due to the frequency at which such signals are transmitted and received. However, the HVTL could cause interference with AM radio signal and digital or analog television signal reception. Impacts from the Proposed Project to communication signals are expected to be minimal.

> A 230 kV line seldom causes reception problems from corona discharges to television signals. Structure types, height, and spacing of the HVTL reduce the potential for shadowing and reflection issues.

The impacts related to interference are only differential between Route 1 and Route 1A in that Route 1 has the potential to impact three less residences (within 500 feet of the proposed ROW) than Route 1A. ATF Alignment 2-1 would not alter the number of homes potentially impacted. ATF Alignment 3-1 would reduce the number of homes potentially impacted by one. ATF Alignment 3-1A would reduce potential impacts to two residences. Section 6.1.1.1 provides a detailed discussion of proximity to structures.

Mitigation

The Applicants would inspect and repair the transmission line to maintain quality reception near the HVTL. If the construction of the Proposed Project causes interference, the Applicants would work with affected residences to correct the issue. Typically the addition of an outside antenna will improve reception to a satisfactory level. The Applicants would work with microwave tower operators to avoid interrupting the signal and may include shorter structures near microwave signal directions.

6.1.1.6 Public Health and Safety

The public expressed concerns regarding potential impacts from electric and magnetic fields (EMF), induction, and stray voltage. There was also concern regarding potential impacts to implantable medical devices, general human health, and public safety from the Proposed Project. Background information on these public health and safety topics was provided in chapter 5 of this Draft EIS. The following sections provide information on the potential for impacts from the proposed HVTL and possible mitigation measures for public health and safety. Computer modeling and similar projects indicate that impacts beyond the ROW (i.e., 130 feet wide) are not anticipated from the Proposed Project.

Impacts

Electric and Magnetic Fields

Electric and magnetic fields (EMF) would be created by the Proposed Project. EMF would be created by the HVTL conductors and by substation transformers. Electric field levels produced would be below the maximum of 8.0 kV/m previously established by the Commission in the state of Minnesota. Magnetic fields produced would be at a level which is not likely to lead to electromagnetic interference.

Induction and Stray Voltage

The transmission lines constructed for the Proposed Project would produce induced currents. Based on modeling conducted by the Applicants, induced currents less than the NESC maximum standard (5 mA) would be produced beneath the proposed HVTL. Transmission lines do not create stray voltage but can induce stray voltage on a distribution circuit parallel or beneath the transmission lines. Stray voltage issues from the Proposed Project are not anticipated.

Implantable Medical Devices

As stated above, the Proposed Project would produce electric and magnetic fields. These fields have the potential to cause electromagnetic interference (EMI) in implanted cardiac devices. The predicted magnetic fields are significantly weaker than the recommended threshold for pacemakers and ICDs set by Medtronic (a major manufacturer). The electric fields produced would be below levels at which modern devices would generally be affected. There is still the potential for EMI with some pacemakers and ICDs. The common pacemaker malfunction due to electromagnetic interference is a reversion to asynchronous mode pacing which is not life threatening or harmful. Normal operation would resume when the person moved away from the source of interference.

Human Health

Based on available literature, there is no definitive evidence that HVTLs result in impacts to human health. Studies have been unable to produce a conclusive link between HVTLs and health concerns such as childhood leukemia.

D.L. Henshaw, et al. have published several papers regarding the effects of power transmission and distribution on human health. The Henshaw Effect refers to a link between the electric fields associated with HVTLs and an increased risk of cancer. Henshaw reports an increase in lung deposition from inhaling electrically charged aerosol pollutants as opposed to neutral pollutants. Corona discharges from HVTL conductors cause an ionization of the surrounding air. The ions which are released can attach to aerosol pollutants which can drift away and be inhaled by or deposited on a nearby person. Henshaw has also reported an increase in the concentration and deposition of radon decay products in the vicinity of power lines that can also increase cancer risks. Other studies have been unable to support Henshaw, and the Henshaw Effect on human health is of scientific debate.

Impacts from the Proposed Project on human health are not anticipated.

Public Safety

The proposed HVTL would be equipped with protective devices to safeguard the public and de-energize the line in the event of an accident or fallen structure or conductor.

The types of impacts to public health and safety are the same for both Route 1 and Route 1A. However, Route 1 has fewer homes within proximity of the ROW than Route 1A which may decrease the potential for impacts in Route 1 versus Route 1A.

Potential impacts would not change with the implementation of ATF Alignment 2-1. ATF Alignment 3-1 would reduce potential impacts to one less home in close proximity to the HVTL. ATF Alignment 3-1A would potentially reduce impacts to two residences.

Mitigation

Significant impacts to public health and safety are not anticipated. The Applicants would comply with local, state, and NESC standards during final design and construction of the proposed HVTL. Safety procedures established by the Applicants would be followed during and after HVTL installation, and the Applicants would implement proper safeguards during construction and operation of the HVTL. The Applicants would take appropriate measures to prevent the occurrence of stray voltage along the route. The Applicants would minimize potential health effects by maximizing the distance between the transmission lines and residences.

6.1.2 Land-based Economics

Land-based economics include the natural resources and amenities that are used to derive value from activities, such as agriculture; recreation and tourism; zoning and land use; and archaeological and historic resources. General information was provided regarding land-based economics in chapter 5. The following sections provide analysis on potential impacts from the Proposed Project and possible mitigation measures for each proposed alignment.

6.1.2.1 Agriculture

Agricultural land designated as prime farmland indicates land that is most desirable for agricultural production. The Code of Federal Regulation 7 CFR 657 defines prime farmland as, "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses." Table 6-3 summarizes the acres of prime farmland soils located within the 130 foot ROW of Routes 1 and 1A, as well as the acres within the ROW for the ATF alignments in each route. Agricultural resources in the Study Area are discussed in section 5.4.1 and shown on Figure 11.

Table 6-3: Farmland Soils Within ROW

Route	Farmland Soil Classification	Acres	ROW Totals
1	All Areas are Prime Farmland	58.1	105.6
	Farmland of Statewide Importance	2.4	
	Prime Farmland, if drained	45.1	
1A	All Areas are Prime Farmland	59.9	144.4
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	51.5	
ATF Alignment 2-1	All Areas are Prime Farmland	60.9	102.81
	Farmland of Statewide Importance	0.01	
	Prime Farmland, if drained	41.9	
ATF Alignment 3-1	All Areas are Prime Farmland	62.3	98.8
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	36.5	
ATF Alignment 3-1A	All Areas are Prime Farmland	60.1	105.1
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	45.0	

Source: NRCS

Impacts

The Proposed Project would result in permanent and temporary impacts to existing farmland. Temporary impacts such as soil compaction and crop damage within the ROW are likely to occur during construction. The timing of construction would dictate the level of temporary impacts with summer or fall construction potentially leading to crop damages, while winter construction would avoid crop damages. Temporary impacts in agricultural fields are estimated to affect approximately one acre per pole during construction activities. Permanent impacts would occur as a result of structure placement on agricultural land and would be confined to the area immediately surrounding each structure, which the Applicants have estimated to be 20 sq-ft. Table 6-4 summarizes the acres of agricultural related land cover within the ROW for the proposed routes.

Table 6-4: Agricultural Land Cover Within ROW

Route	Land Cover	Acres	ROW Totals
1	Pasture/Hay	11.8	12.8
	Soybeans	1.0	
1A	Pasture/Hay	11.3	11.3
ATF Alignment 2-1	Pasture/Hay	9.4	10.4
	Soybeans	1.0	
ATF Alignment 3-1	Pasture/Hay	12.3	13.3
	Soybeans	1.0	
ATF Alignment 3-1A	Pasture/Hay	10.0	10.0

Source: NASS, 2008

The majority of the mapped prime farmland areas within Routes 1 and 1A, as well as the ATF alignments for each route, are currently forested. In areas where an HVTL crosses an agricultural field or pasture, farming or grazing activities could continue around and under the HVTL. Only the areas where each H-frame wooden HVTL structure was placed would result in the loss of agricultural production. The total area of each HVTL structure is estimated to be 20 sq-ft, which is very small compared to the size of typical crop fields or pastures. Due to the small area of land that would either be lost from existing agricultural production or that would permanently impact areas of prime farmland, significant impacts to existing agriculture lands or prime farmland soils are not anticipated as a result of the Proposed Project.

Livestock may be impacted temporarily during the construction phase of the Proposed Project. There is potential of livestock to have reduced access to pasture lands and livestock may be subjected to construction noise. Impact of stray voltage on livestock due to transmission lines is not anticipated as a result of the Proposed Project.

Mitigation

The Applicants would work with affected landowners to minimize impacts to farming operations along the route. Easements would not substantially restrict farming operations as the ROW area between structures would remain available for crop production. The Applicants would utilize previously disturbed areas for construction setup whenever possible. The Applicants would discuss the potential temporary impacts on agricultural land and request landowner permission prior to construction. Restoration would take place following construction, and the Applicants would compensate landowners for crop damage or soil compaction. If required by the Department of Agriculture, the Applicants would work with the Department to develop an agricultural mitigation plan. The Applicants would try to avoid direct impacts to livestock farms and would work with individual landowners to minimize noise impacts to livestock and farm facilities during construction.

6.1.2.2 Mining and Forestry

As previously discussed in chapter 5, mining and forestry have been a historical use of the land in northeastern Minnesota and within the Study Area. The Proposed Project is directly related to the operation of the Essar Steel facility, which will actively mine taconite for steel production on-site once fully operational. The mining and forest products industries are part of the local economy and provide numerous jobs in the region. This section describes potential impacts to mining and forestry from the Proposed Project and potential mitigation measures, if required.

Mining

The Mesabi Iron Range runs northeast to southwest between the cities of Nashwauk and Taconite within the area of Routes 1 and 1A. This region of Minnesota has been extensively mined and consists of open pits, stockpiles, and tailings. Many of the pits are currently filled with water. The new Essar Steel Facility is the primary benefactor of construction of the proposed HVTL and has plans to expand mining operations between Calumet and Nashwauk, including the construction of a new steel slab facility. Mining resources in the Study Area are discussed in section 5.4.2 and are shown on Figure 12.

Impacts

Essar Steel currently owns mining rights within the southern one mile of Routes 1 and 1A. Construction of the proposed HVTL is necessary for Essar Steel mining operations to move forward.

Mitigation

The Applicants have selected route locations that would allow Essar Steel to mine ore resources within the Study Area. The Applicants would work with existing and future mine operators to align the proposed HVTL to limit impacts to current and planned mining operations and develop mitigation measures as necessary.

Forestry

Forests are the predominant land cover in the Study Area, including a variety of coniferous, deciduous and mixed forest lands. Forestry resources in the Study Area are discussed in section 5.4.2 shown on Figure 12.

Impacts

Land that is currently a forestry resource would be permanently impacted by the proposed HVTL. Within the ROW, forested land would be converted to a non-forest use. Forested areas would need to be cleared to allow for construction and operation of the transmission lines. However, the impact to forested areas is small relative to the resources available in the area, and the forestry economy is not likely to be affected. Table 6-5 presents detailed information regarding the forested areas within the ROW for Routes 1 and 1A as well as the ATF alignments for each route.

Table 6-5: Forestry Impacts Within ROW

Route	Proposed Converted Acreage
Route 1	83.8
Route 1A	104.4
ATF Alignment 2-1	87.0
ATF Alignment 3-1	83.5
ATF Alignment 3-1A	106.9

Mitigation

Timber harvested during construction would be made available to landowners for firewood, saw logs, and other uses. During construction, previously disturbed areas would be utilized for construction staging areas whenever possible. Trees and vegetation would be preserved to the maximum extent practical. Temporary access road construction would be coordinated with landowners and temporary impacts would be restored following construction. Previously forested areas, impacted by the Proposed Project, would be allowed to establish low growing species of forbs, grasses, and shrubs that would not interfere with operation and maintenance of the HVTL.

6.1.2.3 Zoning and Land Use Compatibility

The construction of a new HVTL in an area that currently does not have an existing HVTL poses a greater potential for impacts to land use and possibly zoning compatibility, as compared to constructing a new HVTL within an existing utility corridor. The Proposed Project would be located in portions of Itasca County and the cities of Nashwauk and Taconite. These local government entities consider an HVTL a compatible land use with their current respective zoning ordinances.

Impacts

The Route 1 and Route 1A proposed alignments and the ATF proposed alignments are located in the Itasca County farm residential zoning district (Figure 13). According to the Itasca County zoning ordinance, special structures do not require a building permit and are not subject to setback requirements. The proposed HVTL would be considered an essential service and a compatible use.

Mitigation

The Proposed Project is compatible with the Itasca County Zoning Ordinance and the city of Nashwauk Zoning Ordinance. No mitigation would be required for the construction or operation of the Proposed Project.

6.1.2.4 Transportation and Public Services

Transportation and utility infrastructure is established in the Study Area. The Proposed Project would cross or be located adjacent to a variety of existing roadways and infrastructure within the Study Area (Figure 14). The following sections discuss the potential impacts within the proposed HVTL alignment to transportation and public services, including existing utilities, public emergency services, roadways, railways, and airports.

Existing Utilities

There are existing local electrical lines supplying electricity to rural homes along Routes 1 and 1A. Most of the other existing utilities are localized to private residences, such as private wells, septic systems, and individual propane tanks. The Applicants would be required to ensure that existing public or private services would not be disrupted during the construction of the Proposed Project.

Impacts

Route 1 and Route 1A would not cross existing oil or natural gas pipelines or existing HVTL corridors. The Proposed Project would not affect local water and sanitary sewer services as provided by the city of Nashwauk. The new H-frame wooden poles for the HVTL structures would be placed in augered holes approximately 10 to 15 feet deep. Minor grading may be required to provide level construction surfaces at each structure location. These construction activities would have the potential to impact existing underground utilities. Equipment used for augering or stringing operations is tall. Moving vehicles and cranes would have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

Moving vehicles and cranes have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

Mitigation

The Applicants would coordinate with the owners of the existing utilities to acquire easements to build the proposed HVTL along the selected routes. In the event that a Route Permit is granted for the Proposed Project, the Applicants would use the known locations of existing water, sewer, gas, electrical, telephone and cable lines during final engineering and design to avoid impacting these services. Upon completion of the HVTL design, the Applicants would be required to locate all of the above mentioned utilities in the field prior to HVTL construction to avoid disruption of services. In the event that existing utilities are affected during HVTL construction, the Applicants would work directly with the owners of the existing utilities to ensure service is restored in a timely manner.

Public Services

Potential impacts to public services, mainly emergency services, would be related to construction activities that may temporarily disrupt roadways and public access. Generally, construction activities would be staged such that public roads would be minimally impacted by lane closures or brief periods of road closures.

Impacts

The proposed Route 1 HVTL alignment would not affect public service facilities. There is potential for delay in emergency service during transmission line construction; however HVTL construction is not anticipated to cause significant or long term impacts.

The Route 1A HVTL alignment would run approximately 500 feet north of the Nashwauk Volunteer Fire Station building and then would travel south approximately 250 feet west of the fire station. Limited temporary impacts to the fire station would include restricted emergency services due to blocked or congested roadways caused by construction equipment using the public roadway network. The fire station would not be permanently impacted by the proposed HVTL.

The Proposed Project would add a small number of workers during both construction and maintenance of the HVTL; however, it would not result in a measurable increase in the demands on public services such as fire, police or local hospitals.

Mitigation

The Applicants would coordinate with emergency service providers to ensure that there would be no interruption in servicing capabilities. Accessibility to local residences by emergency service vehicles would be provided by stopping construction progress and rearranging equipment so the emergency vehicles could access the residences in need of those services. Once construction was completed, the proposed HVTL would span state, county, and township roads, and therefore would not delay emergency vehicles or services provided.

Highways and Roads

The construction period of the proposed HVTL would last for up to several months depending on route length, terrain, weather, and other factors. Construction traffic would use the existing county and state roadway system to access the Proposed Project and deliver construction materials and personnel. Major truck access to the Proposed Project is generally served by Trunk Highway 65 and US Highway 169. Specific additional truck routes would be dictated by the location required for material delivery or staging.

Impacts

Construction personnel would use the existing county and state roadway system to access the proposed HVTL alignment to deliver construction materials and equipment during active construction of the HVTL. Increases in construction-related traffic on county and township roadways have the potential to damage the roadway system by exceeding functional weight capacity. Equipment used for construction of the proposed HVTL alignment could also damage existing roadways by direct damage to infrastructure.

Motor vehicle traffic in the vicinity of the Proposed Project would be temporarily impacted by the increased construction traffic during the active construction phase of the proposed HVTL alignment. Light, medium, and heavy-duty construction vehicles, along with private, construction personnel vehicles, would travel to and from the construction site.

Maximum traffic volumes are anticipated to occur during pole and line assembly. Traffic disruption associated with construction would be localized for short, temporary periods. At the completion of the HVTL alignment, equipment would be removed from the site or reduced in number. HVTL construction in Route 1 or Route 1A is not anticipated to result in permanent traffic impacts.

Route 1 would cross two CSAHs, two county roads and three smaller township roads. This proposed HVTL alignment would not parallel existing roadways. The annual average daily traffic (AADT) for each road network in Route 1 is listed below in Table 6-6.

Table 6-6: AADT for Route 1 HVTL Alignment Crossings

Road Network	AADT	Survey Year
CR 539	55	2005
CR 532	140	2005
CSAH 56	385	2005
CSAH 8	950	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

Route 1A would cross one Trunk Highway, two CSAHs, and one county road. This proposed HVTL alignment would not parallel existing roadways. The AADT for each road network in Route 1A is listed below in Table 6-7.

Table 6-7: AADT for Route 1A HVTL Alignment Crossings

Road Network	AADT	Survey Year
CR 539	55	2005
CSAH 54	315	2005
TH 65	1150	2006
CSAH 8	950	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

The proposed HVTL alignment would require the installation of new or temporary access roadways adjacent to Route 1 or Route 1A in order to allow construction equipment access. Existing and new access roads would serve to connect the proposed HVTL alignments with the existing roadway system.

Long term impacts to the transportation network from the Proposed Project beyond the construction period are not anticipated.

Mitigation

Construction of the Proposed Project would be in accordance with all associated federal and state permits and laws, as well as industry construction standards. Transportation disruptions are anticipated to be localized, temporary and intermittent for the construction periods required to erect the pole structures. Access easement agreements would be obtained prior to construction and would be maintained to allow for access to ROW during the construction and operation of the proposed HVTL. The Applicants would also coordinate with the Minnesota Department of Transportation (MNDOT), Itasca County, and local government units to obtain the necessary over width/overweight permits as needed for trucks and heavy equipment, and acquire the necessary utility crossing permits. The Applicants would also coordinate temporary road or lane closures due to materials delivery or construction, such as HVTL stringing over public roadways, with the appropriate entities.

Damage to public roads would be repaired in accordance with applicable laws and permits, and damage to private roads would be promptly repaired unless otherwise negotiated with the affected landowner. Traffic management and control of local roadways would be considered in the planning and implementation of HVTL construction, especially when crossing public roads. These measures minimize the potential for traffic disruptions. The Applicants may be required to secure a bond with the jurisdictional county or township in order to provide assurance that repairs would be made if roadways are damaged during construction of the proposed HVTL.

Traffic management and control of local roadways would be considered in the planning and implementation. If applicable, some construction activities would require re-routing of traffic for roadway crossings during active stringing of overhead conductors.

The Applicants would work closely with private landowners to locate HVTL access roads, while minimizing disruptions to land use or the existing rural roadway network. Similarly, close coordination with the local townships would be required to locate final ROW access roads. If loss

or damage to property occurs, landowners would be compensated by the Applicants based on agreements made prior to HVTL construction.

Transporting heavy components for construction of the proposed HVTL would be dictated by seasonal roadway restrictions for the area. Mitigation for road impacts would include an agreement between the Applicants and the potentially affected community for damage to roadways associated with large truck and increased small vehicle traffic, over width/overweight vehicles, or general construction activities.

If applicable, some construction activities would require re-routing of traffic for roadway crossings during active stringing of overhead conductors to avoid traffic impacts. The Applicants would be responsible for contacting the Itasca County Sheriff's Department or local-servicing police department when crossing public roadways. Temporary guard structures would also be required to protect construction crews and the general public during HVTL construction. Guard structures would maintain necessary vertical clearance and traffic flow. The HVTL would be above ground and would span roads and highways after construction is complete.

Railways

Impacts

In addition to the roadway system, construction materials may potentially be hauled on the existing railway network. This may cause a slight increase in rail traffic, but is not anticipated to be a significant impact. The increased rail traffic would be temporary during active construction of the proposed HVTL. No additional rail lines are needed to accommodate the potential temporary increase in rail traffic.

Access easement agreements with BNSF would be obtained prior to construction and would be maintained in order to allow for access during the construction and operation of the HVTL.

The construction of an HVTL has the potential to damage track or railroad crossings within the proposed HVTL alignment. Potential impacts to the existing track could be caused by large equipment hitting or damaging the track during construction. These potential impacts are more likely to occur when the HVTL alignment is near the track or crosses the track. No railways would be crossed by Route 1, Route 1A or the ATF alignments.

Mitigation

Since no impacts are anticipated, no mitigation has been proposed.

Airports

Due to its height, an HVTL can conflict with the safe operation of airports or landing strips and potentially present a concern to aircraft. The placement of HVTL structures or the stringing of HVTL could possibly affect the safe operation of an airport or hinder the maneuverability of aircraft if they are positioned too close to the landing strip.

Impacts

There is an unregistered, private landing strip in the vicinity of Route 1 and Route 1A. The takeoff point for this active, northwest-southeast oriented landing strip is within 0.8 mile from the

proposed Route 1 HVTL alignment and within 0.4 mile of the proposed Route 1A HVTL alignment. Since the takeoff direction is oriented to the northwest, navigation to this landing strip is not expected to be affected.

An inactive north-south landing strip is located 0.5 mile to the east of the proposed HVTL alignment in Route 1. Navigation to this inactive landing strip would not be affected, as the proposed HVTL alignment in Route 1 would not be within the direct flight path of this landing strip.

Furthermore, there are no anticipated interferences expected to navigable airspace with respect to the FAA facility located on TH 65, which is near the proposed HVTL alignments for Route 1 and Route 1A.

Mitigation

The proposed Route 1 HVTL is not expected to impact airspace or navigations to and from the private landing strip. The Applicants would continue to work with the owner of the landing strip, which is located near the intersection of CSAH 8 and TH 65, to ensure that suitable actions are implemented for safe operations. Although impacts to aircraft navigation are not anticipated, final engineering for the proposed Route 1A HVTL alignment would investigate moving the proposed HVTL further from the landing strip and/or reducing the height of transmission structures near the approach area if needed. Additionally, the Applicants would be required to file a Notice of Proposed Construction or Alteration with the FAA.

6.1.2.5 Recreation

The construction of an HVTL has the potential to impact recreational resources and recreational experiences, specifically the use of snowmobile trails. This Draft EIS determined where potential impacts to recreational resources from the Proposed Project could occur based on the proposed HVTL alignment.

Impacts

A section of the Lawron Snowmobile Trail would be crossed by the proposed Route 1 and Route 1A HVTL alignments (Figure 15). A brief change in scenery (i.e., 130 foot cleared ROW) would occur as a snowmobiler crossed the ROW. The use of the trail, however, would not be impacted. The ATF alignments would not alter or eliminate impacts to the Lawron Snowmobile Trail.

No Wildlife Management Areas (WMAs), Scientific and Natural Areas (SNAs), State Parks or other public recreational areas are located within the Route 1 or Route 1A proposed HVTL alignments or the ATF proposed alignments for Route 1 or Route 1A.

Mitigation

No significant impacts to recreation in Routes 1 and 1A are anticipated, and no mitigation has been proposed.

6.1.2.6 Archaeological and Historic Resources

The construction of an HVTL has the potential to disturb land and can alter landscapes by potentially introducing a new visual impact. These impacts can potentially affect the integrity of archaeological and historic resources within a project vicinity.

As discussed in section 5.4.6 of this Draft EIS, SHPO records were reviewed to identify potential archaeological and historic resources within the Study Area. Based on SHPO records, most recorded resources are outside of the Proposed Project and proposed HVTL alignments. A full listing of potential archaeological and historic sites identified in SHPO records within the Study Area is provided in Table 5-13. There were no sites identified within the ATF alignments.

As previously discussed in section 5.4.6, there may be additional archaeological and historic resources in the Study Area that have not yet been identified or recorded by SHPO. Unknown resources have the potential to be impacted by the Proposed Project primarily during the construction phase. The Proposed Project is not anticipated to cause adverse impacts to archaeological and historic resources.

Mitigation

As outlined in the Route Permit Application and discussed in section 5.4.6 of this Draft EIS, the Applicants have initiated consultation with the Minnesota SHPO to identify records of archaeological and historic sites. No adverse impacts to identified sites are anticipated. If currently unidentified sites are discovered during construction, the Applicants would coordinate directly with SHPO and would determine the proper measures to minimize or mitigate for impact to the sites.

The Applicants indicated in the Route Permit Application that the potential existence of the Native American burial mounds near Little Sucker Lake needs to be further investigated prior to construction. If burial mounds are discovered, measures to avoid and not disturb the burial mounds would be taken in accordance with Minnesota Statutes, section 307.08.

The Applicants would also integrate into the construction bid documents a training, monitoring and discovery plan should previously unknown cultural resources or human remains be inadvertently encountered during construction. The plan would outline the procedure for handling such discoveries in an efficient and legally compliant manner. The plan may include the following topics: construction contractor training, procedures for identification and protection of resources in the field, contract information for parties to address a discovery, and procedures for avoidance and associated tasks in the event of work stoppage in a construction area. With regard to human remains, project-specific procedures would be outlined to ensure that the appropriate authorities could be activated in accordance with state statutes.

6.1.3 Natural Environment

HVTL projects typically traverse miles of land through undeveloped areas and along existing utility corridors. Natural resources typically influence the design, alignment, and construction of a new route based on topography and other natural features, such as lakes, forests, and wetlands.

Chapter 5 provided information on the existing conditions of the natural environment of the Study Area, including air quality; water resources; wetlands; flora and fauna; and rare and unique natural resources

and critical habitat. Potential impacts within the proposed HVTL alignment related to the natural environment and possible mitigation measures are discussed in the following sections.

6.1.3.1 Air Quality

The Proposed Project may affect air quality in the area through corona effects and from leaks of the Greenhouse Gas sulfur hexafluoride (SF_6) at the electrical substations. In addition, there may be limited short term emissions from vehicle exhaust during construction of the transmission line.

Corona

Corona is the partial electrical discharges along an HVTL. Corona may ionize the air surrounding the transmission line, generating ozone and nitrogen oxides from the nitrogen and oxygen naturally occurring in the air. Concentrations of approximately 0.8 parts per billion (ppb) ozone may occur at the transmission line elevation with no measurable increase at ground level (Route Permit Application, 2009). A concentration of 0.8 ppb ozone is less than two percent of the daily ozone National Ambient Air Quality Standard of 0.075 parts per million (or 75 ppb). Elevated ozone concentrations were detected during foul weather, and only at the transmission line elevation, not at ground level. Nitrogen oxide concentrations observed at the transmission line elevation were approximately one fourth of the ozone levels, also during foul weather. A concentration of 0.2 ppb is approximately four thousandths of the annual NO_2 National Ambient Air Quality Standard of 0.05 ppm or 50 ppb. The 0.2 ppb NO_2 concentration is unlikely to occur throughout the course of an entire year.

> Corona (i.e., the partial electrical discharge along the HVTL) may ionize the air surrounding the transmission line, generating ozone and nitrogen oxides from the nitrogen and oxygen naturally occurring in the air.

Background ozone generation from air pollution in the Study Area would be higher during warmer, sunnier weather and limited by humidity. Therefore, the high corona ozone generation and high background ozone concentrations are not expected to occur simultaneously.

The Henshaw Effect is a theory that fine particulates already present in the air surrounding HVTLs may become ionized from HVTL corona. Ionization of the particulates is believed by Dr. Denis Henshaw, HH Wills Physics Laboratory, University of Bristol, United Kingdom, to increase the deposition of the fine particulates within the lungs. Fine particulates may be comprised of polycyclic aromatic hydrocarbons. The increased deposition may lead to increased lung disease and cancer rates.

Fugitive Dust

Temporary fugitive dust emissions from construction activities may occur. Along the proposed routes, clearing vegetation and driving the utility poles may create exposed areas susceptible to wind erosion. In addition, tailpipe emissions may generate exhaust from the construction vehicles.

Fugitive dust is considered particulate matter under air quality regulations. The concentrations of fugitive dust that is fine particulate matter (PM less than 2.5 microns or $PM_{2.5}$) is generally small, or approximately three percent to ten percent of total particulate matter (USEPA's AP-42, Sections 13.2 and 11.9). Since fine particulate matter has the potential to travel further into the lungs, it is of greater concern than larger particle size ranges.

Construction activities would follow best management practices. Petroleum based dust suppressants would not be used. Construction vehicles with excess tailpipe emissions would not be operated until repairs could be made. The disturbed area for each route would be minimized.

6.1.3.2 Water Resources

There are a significant number of water features located within Itasca County and the Study Area (Figure 16). The lakes, rivers and streams in the Study Area as well as a description of the floodzones and groundwater resources are provided in section 5.5.2 of this Draft EIS. Construction of the Proposed Project would occur near, over and adjacent to a variety of surface and groundwater features. A discussion of the potential impacts to surface water, floodzones, and groundwater resources is provided as well as potential mitigation measures that would be required.

Impacts

Surface Water

There are lakes located adjacent to Route 1 and 1A, but there are no lakes located within either Route 1 or Route 1A. As a result, the proposed HVTL alignments for Routes 1 and 1A would not result in lake crossings. Additionally, the ATF Alignments, 2-1, 3-1, and 3-1A would not result in lake crossings.

There are four streams that cross through Route 1 and three streams that cross through Route 1A. The four streams that cross Route 1 include two unnamed tributary streams to the East River and two unnamed tributary streams to the Prairie River. All four streams would be crossed by the proposed HVTL alignment, for a total of four new utility stream crossings (Figure 7). ATF Alignment 2-1 would not result in an additional stream crossing as it would cross the southern tributary to the Prairie River slightly to the east of the Applicant's proposed alignment. However, ATF Alignment 3-1 would result in additional stream crossings. ATF Alignment 3-1 would cross the southern tributary to the Prairie River slightly to the east of ATF Alignment 2-1, but this alignment would also cross this tributary two additional times due to the meandering nature of this stream (Figure 7). As a result, the inclusion of ATF Alignment 3-1 with the Route 1 HVTL alignment would result in a total of six new utility stream crossings.

Construction of the proposed HVTLs would result in new stream utility crossings for both Route 1 and Route 1A.

The three streams that cross Route 1A include two unnamed tributary streams to the East River and one unnamed tributary to the Prairie River. All three of these tributaries streams would be crossed by the proposed Route 1A HVTL alignment. The western tributary to East River crosses Route 1A two times. As a result, the Route 1A alignment would result in four new utility stream crossings (Figure 7). ATF Alignment 3-1A would cross the western tributary to the East River slightly north of the Applicants' proposed alignment but would not result in additional stream crossings.

Impacts to surface waters from the construction of the Proposed Project could occur as a result of vegetation clearing within the ROW, as well as site grading and structure placement at each of the transmission line pole locations. These project related activities could result in erosion that could lead to sediment runoff into adjacent lakes, rivers or streams. Impacts are most likely to occur at HVTL construction or ROW clearing locations adjacent to water bodies or at stream or lake

utility crossings. There would be some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to local surface waters.

Floodzones

There are no FEMA defined floodzones associated with the streams and rivers that pass through Routes 1 and 1A. As a result, the new stream utility crossings associated with the Applicants' proposed HVTL alignments in Routes 1 and 1A or the ATF alignments for Routes 1 and 1A would not result in impacts to floodzones.

Groundwater

The Study Area is located within the groundwater recharge area known as the Mississippi River Headwaters (HA-278). Within this area, bedrock is typically located between five and over 500 feet below the ground surface. Groundwater aquifers in this region are typically five to 50 feet in thickness within gravel soils located from 50 to 500 feet below the land surface. The proposed wooden H-frame transmission line poles would be placed in augered holes at depths of 10 to 15 feet below the surface. Therefore the HVTL poles would not intercept groundwater aquifers in the area. Additionally due to the depth of the local groundwater aquifer, it is unlikely that temporary dewatering would be required during HVTL construction. There would be some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to the local groundwater aquifer.

Mitigation

The Applicants would be required to obtain a permit from the MNDNR for the new stream utility crossings. It is unlikely that the MNDNR permit would allow the placement of HVTL poles within streambeds. However, if upon completion of final HVTL design it was determined that it would not be possible to avoid placement of HVTL poles within a streambed, the Applicants would also be required to obtain a work in public waters permit from the MNDNR. This permit would require that the Applicants provide a plan for minimizing disturbance of habitat and water quality within the stream during construction.

The Applicants would be required to obtain permits from the MNDNR and MPCA for potential impacts to surface waters.

The Proposed Project would disturb more than one acre of land and as a result would be required to obtain an NPDES construction permit from the MPCA. The NPDES permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP). Within the SWPPP the Applicants would be required to identify specific construction BMPs that would be implemented to minimize impacts to the water quality of surface waters adjacent to or within the HVTL construction ROW. Construction BMPs would include items such as silt fences, bio-roles, staked bales or silt curtains. Once construction is complete the disturbed areas would be restored to the previous vegetation condition if possible. In the case of forested lands, vegetation would be replaced with an approved native grass seed mixture to establish suitable low height vegetative cover. Upon completion of vegetation restoration within the ROW, sediment runoff would be similar to conditions prior to construction. The implementation of the construction BMPs in the SWPPP would ensure minimal impacts to water quality of adjacent water bodies.

Floodzones would not be impacted by HVTL construction within Route 1 or Route 1A. Groundwater aquifers are located below the depth of construction for the HVTL poles. The NPDES construction permit that would be required for the Proposed Project would address the handling of stored construction materials, including items such as diesel fuel or transmission fluid. If a spill occurs, the Applicants would be required to implement the measures identified in the NPDES construction permit to minimize impacts to surface water or groundwater resources. In the event of a spill of more than five gallons, the Applicants would be required to contact the MPCA state duty officer and then would be required to conduct spill remediation activities as directed by the duty officer.

6.1.3.3 Wetlands

The Proposed Project is located in Itasca County, which has an abundance of wetlands of varying types. Chapter 5 of this Draft EIS provides information on the wetlands located within the Study Area (Figure 17). The following sections discuss potential impacts to wetlands located within the proposed HVTL alignments and possible mitigation measures for impacts to those wetlands.

Impacts

Wetlands within Route 1 and 1A were identified using NWI data in section 5.5.2 and are displayed in Figure 7. The regulatory framework in regard to wetlands is also described in section 5.5.2.

The proposed alignment for the HVTL encompasses a 130 foot wide ROW within each route. Table 6-8 compares and summarizes wetland areas within the 130 foot ROW of each HVTL alignment by total wetland area and by wetland type.

Table 6-8: Wetlands Within Route 1 and Route 1A Proposed HVTL ROW

Route	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Total Wetland Area (acres)
Route 1	0.0	6.5	0.0	0.0	0.0	6.3	5.4	0.5	**18.6**
ATF Alignment 2-1	0.0	8.9	0.0	0.0	0.0	9.0	4.6	0.5	**22.9**
ATF Alignment 3-1	0.0	16.8	0.0	0.0	0.0	8.2	4.6	0.5	**30.0**
Route 1A	0.0	7.6	0.0	0.0	0.0	7.5	5.1	8.6	**28.8**
ATF Alignment 3-1A	0.0	6.9	0.0	0.0	0.0	7.3	5.9	8.3	**28.5**

Three types of wetland impacts would potentially occur from the Proposed Project: permanent impacts, temporary impacts, and conversion of wetland type. Impacts would be quantified by the Applicants prior to construction.

Permanent impacts would occur from dredging or filling during installation of structures associated with the HVTL. The Route Permit Application indicates that the construction of an H-frame wooden HVTL structure impacts 20 sq-ft of land. Permanent impacts to wetland

encompassing approximately 20 sq-ft per structure would occur from filling activities that would be necessary wherever a structure would be installed within a wetland. Structures would be installed within wetlands that could not be avoided by the H-frame structure spacing, which would vary from 600 to 1,000 feet.

Temporary impacts to wetlands within the proposed HVTL alignment would occur from construction activities within the wetland basins including temporary vegetation removal or soil compaction. Temporary impacts would be caused by crossing the wetland during construction of the HVTL.

Impacts classified as conversion of wetland type would occur wherever vegetation is permanently cleared within the HVTL ROW. Woody forested vegetation would likely be the only vegetation type that would be permanently cleared. As a result, the Proposed Project would potentially convert wetland types with woody vegetation, shrub swamp (Type 6) and wooded swamp (Type 7), into wetland types such as wet meadow (Type 2) or shallow marsh (Type 3) that would have similar hydrologic regimes but would be dominated by non-woody species.

In Route 1 and Route 1A and respective ATF alignments, shrub swamp and wooded swamp are wetland types containing woody vegetation. As shown in Table 6-8, the collective areas of shrub swamp and wooded swamp that would be potentially converted to a different wetland type are similar, ranging from 11.7 acres to 13.6 acres

Indirect wetland impacts would potentially occur if impacts outside of the HVTL ROW are caused by Project activities. They would result from a direct physical alteration that occurs within the HVTL ROW (filling, excavation, vegetation clearing) that may indirectly affect characteristics of wetlands, such as vegetation type, hydrology, or wetland functions, outside of the HVTL ROW.

Mitigation

Regulatory agencies with jurisdiction over wetlands within the Study Area are identified in section 5.2.2. Regulatory processes require documentation of existing wetland boundaries, quantification of proposed wetland impacts, and documentation of project sequencing. Project sequencing includes wetland impact avoidance and minimization efforts, as well as proposed mitigation for unavoidable impacts.

For unavoidable wetland impacts, the permitting process determines the wetland mitigation ratio and type of wetlands created.

Unavoidable impacts to wetland from the Proposed Project must be mitigated as required by state and federal regulatory requirements. The mitigation ratio (i.e., the amount of wetland that must be created to replace impacted wetlands) is determined in the permitting process. The permitting process also ensures that equivalent wetland types are created.

The mitigation ratio is also influenced by a number of other considerations, including:

- the type of impact (i.e., permanent, temporary or conversion of type);
- whether mitigation is completed concurrently or prior (in-advance) to wetland impacts;
- location of the mitigation wetlands relative to the impact wetlands (in-place);
- the type of mitigation wetlands relative to the impact wetlands (in-kind);
- the type of mitigation proposed, such as creation, restoration, or preservation; and

- winter time construction may be considered in an effort to minimize impact to vegetation communities.

The overall goal of the regulations is to replace wetland impacts with wetlands that are of the same type, provide similar functions, and are of comparable or better quality compared to the impacted wetlands.

Permanent wetland impacts within Route 1 and Route 1A would be quantified by the Applicants, and a wetland replacement plan would need to be submitted to regulatory agencies and approved prior to the start of construction. The Applicants would avoid permanent wetland impacts within Route 1 and 1A by spanning wetlands wherever possible. Where wetlands are too large to span and construction of structures are necessary in the wetland, the Applicants would minimize wetland impacts to the greatest extent possible. The Applicants have also committed to additional minimization efforts that are identified in the Route Permit Application.

Temporary wetland impacts would occur within Route 1 and Route 1A where wetlands would need to be crossed during HVTL construction. Temporary impacts are regulated differently by state and federal agencies. WCA allows for temporary impacts for up to six months without requiring mitigation as long as areas are restored to original conditions at the completion of construction. The USACE has required permanent wetland replacement for temporary impacts to wetlands (six months or less) in the past for other projects. The replacement ratios used by the USACE for temporary wetland impacts typically range from 0.1:1 to 0.5:1. Potential temporary wetland impacts would need to be quantified by the Applicants prior to the start of construction. Areas of temporary wetland impact would be restored as required at the completion of construction activities.

The USACE may regulate the temporary or permanent conversion of wetland type by requiring mitigation at a ratio generally ranging from 0.1:1 to 0.5:1, depending on the type of wetland that is impacted. Generally, the USACE would be most concerned with the conversion of wetlands of Type 6 and Type 7 basins to wetland types containing non-woody vegetation. The USACE may require a case-by-case evaluation to determine the required compensation for wetland impacts.

WCA does not specifically regulate conversion of wetland type through the clearing of vegetation if the activity does not involve draining, filling, or excavating. Itasca County SWCD, as the responsible WCA agent, has the authority to interpret whether activities associated with clearing constitute draining, filling, or excavating result in impacts, and therefore would require mitigation.

Indirect impacts to wetlands would be avoided by the Applicants by using sound construction practices. According to the Route Permit Application, these practices would be detailed in the NPDES permit and SWPP that would be completed prior to the start of construction.

6.1.3.4 Flora and Fauna

The Proposed Project would result in the alteration of the vegetation and wildlife habitat conditions in the Study Area. Alterations would occur through the establishment and maintenance of ROW and the construction of new HVTLs. A description of the potential impacts to vegetation, wildlife habitat, wildlife populations and fisheries resources, along with required mitigation, is provided in this Draft EIS.

Impacts

Vegetation

The Applicants have proposed to establish 130 foot wide ROW for construction and operation of the proposed HVTL. Land cover within the Study Area is presented in Figure 18. An analysis of the land cover and vegetation communities within the new 130 foot ROW was conducted for the proposed HVTL alignments in Route 1 and Route 1A. An additional analysis of the vegetation was conducted for Route 1 including ATF Alignment 2-1, and ATF Alignment 3-1, and for Route 1A including ATF Alignment 3-1A. The vegetation communities within the 130 foot ROW for each of the five alignment alternatives are presented in Table 6-9.

Table 6-9: 2008 NASS Land Cover Analysis for Each HVTL Alignment

Land Cover Class	Route 1 Alignment	ATF Alignment 2-1	ATF Alignment 3-1	Route 1A Alignment	ATF Alignment 3-1A
Deciduous Forest	68.6	72.2	71.4	82.7	87.2
Developed	5.2	4.9	5.1	8.8	6.2
Evergreen Forest	15.3	14.8	12.1	21.6	19.7
Grassland	2.3	2.0	2.6	2.0	2.0
Herbaceous Wetlands(1)	1.4	1.1	3.6	7.7	7.7
Open Water	0.2	0.2	0.2	0.0	0.0
Pasture/Hay/Crop	12.9	10.5	13.4	11.3	10.0
Shrubland	12.1	12.7	11.5	11.4	9.9
Woody Wetlands(1)	0.0	0.0	0.0	0.5	0.5
Total(2)	**117.9**	**118.5**	**119.9**	**146.1**	**143.2**

(1) NASS wetland categories do not match NWI wetland classifications used for detailed analysis of wetland impacts in section 6.1.3.3.
(2) ATF Alignments 2-1, 3-1 and 3-1A add length to the overall HVTL, which result in different land cover totals within the 130 ft ROW.

The establishment of new ROW for the construction of the proposed HVTL would result in clearing of trees within forested lands, including woody wetlands. After construction of the HVTL, a new low lying native ground cover would be established within the HVTL ROW. This would result in the loss of forested vegetation. For the other land cover types, such as grasslands, shrublands and herbaceous wetlands, the establishment of new ROW and construction of the proposed HVTL would have less of an impact on the vegetation community. Vegetation within grasslands and herbaceous wetlands would be reestablished with vegetation communities similar to the existing vegetation. For shrublands, some taller shrubs may be permanently removed, but in general this vegetation community would not be significantly altered by the establishment of the new ROW and construction of the proposed HVTL.

Forested lands cleared to establish the ROW for the HVTL would be replaced by a new low lying vegetation community of grasses.

Another potential impact to vegetation communities during ROW clearing and construction would be the introduction or spread of invasive plant species or noxious weeds. When established vegetation is cleared for a construction project, invasive or noxious weeds can become established because they are typically early colonizing species that grow quickly on disturbed areas. Under worse case situations, once established invasive plant species alter habitats and

reduce biodiversity (USDA, 2008). Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds.

Wildlife

Wildlife habitat would be altered as a result of the Proposed Project. The most significant alterations would occur in the form of ROW clearing within forested lands. Forested areas would be cleared of trees that would interfere with the operation and maintenance of the HVTL. The conifer and deciduous forest communities would be replaced with a low lying vegetative cover, consisting mainly of grasslands. The acres of forested lands within the 130 foot ROW of the proposed HVTL alignment in Route 1, Route 1A and the routes including the ATF alignments are presented in Table 6-9. However, this land would not be completely lost as wildlife habitat as would be the case if the land was converted to urban or industrial uses. Instead it would simply be altered to a different vegetation community. The establishment of a new grassland community in the HVTL ROW would provide additional habitat for some wildlife species.

Clearing the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area.

Clearing the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area. Large equipment would create noise causing wildlife to avoid the area temporarily. However, the 130 foot ROW is relatively narrow compared to the large habitat tracks that are within the Study Area and adjacent to the HVTL alignments. The majority of wildlife within the Study Area and along the Iron Range has become accustomed to human disturbance from logging, mining or other human developments. As a result, the wildlife living within the overall Study Area and along the proposed HVTL alignments would likely disperse to available adjacent habitat. In general the amount of habitats that would be impacted by the construction of the Proposed Project is small compared to the amount of available habitat in the Study Area.

The use of large construction equipment to clear the ROW and construct the HVTL may result in some local mortality to wildlife that is not able to quickly disperse to available adjacent habitat. Small or slow moving birds, mammals, amphibians and reptiles may not be able to avoid the large, fast moving, mechanized equipment. This has the potential to disturb or destroy nests or burrows with juvenile wildlife that is incapable of dispersing and may also result in direct mortality to some species. However, due to the relatively narrow width of the 130 ROW compared to the large habitat tracts in the Study Area and Itasca County, wildlife mortality would be to local individuals and is not anticipated to result in population level impacts. In general, the impacts to wildlife habitat and wildlife populations from the Proposed Project are expected to be small.

Fisheries

H-frame structures would be 600 to 1000 feet apart, which would allow for spanning of most lakes, rivers and streams crossed by the HVTL.

The construction of the proposed HVTL would result in new water body crossings. The lakes and streams that would be crossed by the proposed alignments for Route 1, Route 1A and the ATF alignments are described in section 6.1.3.2. Clearing of the HVTL 130 foot ROW and grading to construct HVTL structures has the potential to result in sediment erosion or water quality impacts to adjacent lakes and streams.

The spacing of the H-frame wooden transmission line structures proposed by the Applicants would be 600 to 1,000 feet. This would allow the Applicants to span most lakes, rivers and streams crossed by the proposed HVTL alignments, limiting impacts to aquatic habitat or water quality. Transmission pole structures placed within stream or lake beds, or immediately adjacent to lakes or streams would have the greatest potential of resulting in sedimentation, water quality impacts or alteration of aquatic habitat. The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings in Minnesota. These required permits would limit or eliminate the placement of HVTL structures within lakes or streams. After completion of ROW clearing and HVTL construction, low lying vegetative cover would be established within the ROW, which would return the land to a condition similar to pre-construction. The establishment of new vegetation within the ROW would minimize or eliminate the potential for long term water quality or sediment impacts from the Proposed Project. Overall, the impacts to water quality and aquatic habitat from the Proposed Project are expected to be small.

Mitigation

The construction of the Proposed Project, including the establishment of new ROW and construction of the HVTL, would result in impacts to wildlife habitat and may result in impacts to local wildlife populations, water quality or aquatic habitat. During public scoping for this Draft EIS, residents identified concerns over impacts to mature forest stands. In the event the a Route Permit is granted for the Proposed Project, the Applicants would work directly with landowners during the easement acquisition process to identify habitat or forest concerns and make appropriate adjustments to the HVTL alignment to minimize the loss of mature forests. Impacts to wetland habitats would require a permit from Itasca County and/or the USACE prior to construction, which would require the development of an acceptable mitigation strategy to offset wetland habitat impacts from the Proposed Project. Additionally, the Applicants would be required to conduct field surveys to delineate wetlands or identify sensitive biological resources and/or habitats for the selected routes. The results of the field surveys would be potentially used to alter the HVTL alignment in order to minimize the overall impacts to vegetation, wildlife habitats or wetlands.

The ROW clearing for the Proposed Project may result in the spread or introduction of noxious weeds or invasive plant species. Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds. The Applicants have stated in the Route Permit Application that prior to construction, a designated inspector would conduct a field review for noxious weeds in areas designated for ROW, construction or staging activities. The Applicants would attempt to control the spread of noxious weeds during construction. Additionally, the Applicants would comply with all noxious weed laws in Minnesota and would control noxious weeds that are found in the ROW during vegetation maintenance activities.

The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings. These permits would limit or eliminate the placement of HVTL structures within streams or lakes and would identify measures that would be required to reduce impacts to water bodies during the construction of utility crossings. Prior to construction, the Applicants would be required to obtain an NPDES construction permit and develop a SWPPP for the Proposed Project. The NPDES permit and SWPPP would identify construction practices and BMPs that would be followed to limit habitat disturbance and minimize or eliminate impacts to water quality and aquatic habitat.

6.1.3.5 Rare and Unique Resources/Critical Habitat

The Proposed Project would result in the disturbance of vegetation communities within the Study Area, including forests, grasslands and wetlands. Some of these communities would be altered, which could result in an impact to habitat required by threatened, endangered or rare plants or animals. The known existing threatened and endangered plants and animals in the Study Area are discussed in section 5.5.5 of this Draft EIS.

Impacts

The construction of the proposed HVTL alignment for Routes 1 and 1A would result in the creation of new utility ROW. Establishment of new ROW and construction of the proposed HVTL would result in crossing water bodies and impacts to wetland and forest communities. However, there are no known records of state or federally listed threatened, endangered or special concern plant or animal species within Route 1 or Route 1A (Figure 19). As a result, the establishment of ROW and construction of the proposed HVTL for Route 1 or Route 1A would not result in impacts to threatened, endangered or special concern plant or animal species. Additionally, the inclusion of the ATF alignments for Route 1 or Route 1A would not result in impacts to threatened or endangered plant or animal species.

Mitigation

Establishment of new ROW and construction of new transmission line for the proposed HVTL in Route 1 or 1A would not impact threatened, endangered or special concern plants or animals. As a result, no mitigation has been proposed.

Table 6-10: Routes 1 and 1A and ATF Alignment Summary of Potential Effects

Topic	Route 1 (Preferred)	Route 1A (Alternate)	ATF Alignment 2-1	ATF Alignment 3-1	ATF Alignment 3-1A	Summary of Potential Impacts
Effects on Human Settlement						
Proximity to Structures/Displacement	Four homes within 500 ft. of the proposed HVTL.	Seven homes within 500 ft. of the proposed HVTL.	Four homes within 500 ft. of the proposed HVTL.	Three homes within 500 ft. of the proposed HVTL.	Five homes within 500 ft. of the proposed HVTL.	Route 1A would have the most homes within 500 ft. ATF 3-1 would have the least homes. No displacement would occur.
Property Values	Impacts to property values can not be determined with certainty, but are tied to a number of factors, including condition of the property, housing market, proximity to the HVTL, aesthetics, and buyer's opinion.					
Aesthetics	The Proposed Project would introduce a new visual impact for those homes closest to the proposed alignment that do not have vegetative or topographical barriers as visual screening. Visual impacts may also be created at water body or trail crossings.					
Noise	The Proposed Project would not exceed MPCA noise standards. Noise is anticipated to be minimal to inaudible beyond the proposed HVTL alignment ROW. No houses are located in the ROW in Route 1, Route 1A or the ATF alignments.					
Interference	Impacts to omnidirectional and unidirectional signals are expected to be minimal from the Proposed Project. Some disruption of AM radio or analog television signals may occur but would only likely occur directly below the HVTL.					
Public Health and Safety	Impacts to public health and safety from the Proposed Project are not anticipated. The Applicants would comply with all local, state and NESC safety standards during design, construction, operation and maintenance of the proposed HVTLs.					
Effects on Land-based Economics						
Agriculture	12.8 acres of agricultural lands within ROW.	11.3 acres of agricultural lands within ROW.	10.4 acres of agricultural lands within ROW.	13.3 acres of agricultural lands within ROW.	10.0 acres of agricultural lands within ROW.	Farming and grazing activities could continue around and under HVTLs. A very small amount of agricultural land would be lost to production.
Mining and Forestry	83.8 acres of forested lands within ROW.	104.4 acres of forested lands within ROW.	87.0 acres of forested lands within ROW.	83.5 acres of forested lands within ROW.	106.9 acres of forested lands within ROW.	Forested lands would be lost from timber production due to ROW clearing. Impacts would be small compared to regional forest resources.
Zoning and Land Use Compatibility	The proposed HVTLs are a compatible use within Itasca County and the city of Nashwauk. Zoning or land use variances or special permits would not be required.					
Transportation and Public Services	The Proposed Project would not impact local public services such as police, fire or medical. Some temporary road closures during construction may require coordination with local emergency services. The Applicants would obtain local and MNDOT permits for all road utility crossings. Traffic patterns may experience temporary disruption during construction but would not be permanently altered. Railroad and airport traffic and use would not be disrupted.					

Topic	Route 1 (Preferred)	Route 1A (Alternate)	ATF Alignment 2-1	ATF Alignment 3-1	ATF Alignment 3-1A	Summary of Potential Impacts
Recreation	One new snowmobile trail crossing.	One new snowmobile trail crossing.	One new snowmobile trail crossing.	One new snowmobile trail crossing.	One new snowmobile trail crossing.	Temporary impacts to trail use could occur with winter construction.
Archaeological and Historic Resources	There are no historic or archeological sites near Route 1, Route 1A or the ATF alignments. No adverse impacts to historic or archeological sites are anticipated. The Applicants will coordinate with SHPO in the event that archaeological resources are discovered during HVTL construction.					
Effects on the Natural Environment						
Air Quality	Temporary fugitive dust impacts would occur during construction but are expected to be minor. Construction and operation of the HVTL would not be a significant source of air emissions.					
Water Resources	No lake utility crossing and four stream utility crossings would result from HVTL alignment.	No lake utility crossings and four stream utility crossings would result from HVTL alignment.	No lake utility crossings and four stream utility crossings would result from HVTL alignment.	No lake utility crossings and six stream utility crossings would result from HVTL alignment.	No lake utility crossings and four stream utility crossings would result from HVTL alignment.	MNDNR permits would be required for public water utility crossings. The Proposed Project would not impact floodzones or groundwater resources. BMPs would be implemented during construction to minimize water quality impacts.
Wetlands	18.6 acres of wetlands and 5.4 acres of forested wetlands within ROW.	28.8 acres of wetlands and 5.1 acres of forested wetlands within ROW.	22.9 acres of wetlands and 4.6 acres of forested wetlands within ROW.	30.0 acres of wetlands and 4.6 acres of forested wetlands within ROW.	25.3 acres of wetlands and 5.1 acres of forested wetlands within ROW.	Wetland impacts for the Proposed Project would require a permit from Itasca County SWCD and/or the ACOE. A mitigation plan would be required to offset impacts to wetlands basins or vegetation.
Flora and Fauna	83.6 acres of forested habitat would be impacted.	104.4 acres of forested habitat would be impacted.	87.0 acres of forested habitat would be impacted.	83.5 acres of forested habitat would be impacted.	106.9 acres of forested habitat would be impacted.	Forested habitat would be lost as ROW is cleared. Impacts, including mortality may occur to local wildlife but would not result in population level impacts
Rare and Unique Resources/Critical Habitat	No known occurrences of threatened or endangered plant or animal species within route.	No known occurrences of threatened or endangered plant or animal species within route.	No known occurrences of threatened or endangered plant or animal species within route.	No known occurrences of threatened or endangered plant or animal species within route.	No known occurrences of threatened or endangered plant or animal species within route.	The Applicants would coordinate with the MNDNR in the event that threatened or endangered species are discovered during wetland or other field surveys.

6.2 BOSWELL END OF 94 LINE TO ESSAR STEEL MINE SUBSTATION

Route 2 and Route 2A would provide power to Essar Steel from the Boswell substation (Figure 8). Both Route 2 and Route 2A begin at the existing 94 Line 230 kV HVTL near the Boswell substation. Route 2 would utilize an existing route alignment, while Route 2A would create a new route alignment and ROW. Route 2A is wide enough to allow for shifting of the preliminary alignment within the route to avoid impacts to residences or sensitive resources. Additionally, ATF alignments have also been identified, which give further consideration to residences and other factors in both Route 2 and Route 2A.

6.2.1 Human Settlement

Background information on human settlement, which described existing conditions related to development patterns and the community, was provided in chapter 5. This section of the Draft EIS provides information on the potential impacts to human settlement from construction and operation of the Proposed Project, including proximity to structures and potential displacement; property values; aesthetics; noise; interference to radio, television, internet or cellular phones; and public health and human safety related to electric and magnetic fields, implantable medical devices, and stray voltage. Mitigation measures for each of the topic areas are also provided.

6.2.1.1 Proximity to Structures and Displacement

Displacement occurs when a residence is located at a distance that would interfere with the safe operation of a transmission line. HVTL projects have the potential to result in displacement depending on project area conditions and densities of commercial or residential properties within an HVTL route. Utilities typically do not allow residences or businesses within the final ROW easement.

Displacement results during ROW acquisitions where property currently occupied by a residence or business is required for the HVTL ROW. Typically the Applicants would request an easement to use a narrow strip of land within a property. However, ROW acquisition is regulated by Minnesota Statutes Section 216E.12, subd. 4. This statute gives the property owner the option to require the Applicants to purchase an entire property that is crossed by an HVTL, at fair market value. Eligibility to exercise this right depends on property classification under Minnesota Statute Section 273.13 and capacity ($\geq$ 200 kV) of the HVTL.

Impacts

The Applicants provided a dataset identifying residences in the Study Area. Residences were identified through field observation/confirmation, analysis of high resolution aerial photography, and discussions with the public by the Applicants. The residences within the proposed 130 foot ROW for Routes 2 and 2A were identified using the data set provided by the Applicants. The number of homes within 500 feet of the proposed route centerlines was also examined. Table 6-11 summarizes the results of this analysis.

Table 6-11: Number of Residences Proximate to Proposed Alignment

Route	Within 130' ROW	Within 500' of Centerline
Route 2	**0**	**7**
Route 2A	**0**	**7**
ATF Alignment 2-2	**0**	**7**
ATF Alignment 3-2	**0**	**7**

ATF Alignment 2-2 would shift the proposed edge of ROW of Route 2 on the east side to the west off of private land. ATF Alignment 3-2 would double circuit the proposed HVTL or move the line to the south of Island Lake. ATF Alignments 2-2 or 3-2 would not alter the number of residences in proximity to Route 2.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid the need for displacement. The construction of Route 2 or Route 2A is not anticipated to cause displacement of residences or businesses. The Applicants' final ROW alignment and structure locations would maximize the distance of the HVTL from homes and commercial buildings to the extent practical.

6.2.1.2 Property Values

During scoping for this Draft EIS, concerns were raised regarding whether the Proposed Project would have a negative impact on property values. As previously discussed in chapter 5 of this Draft EIS, property values are dependant on a number of factors, so it can be difficult to determine the affect one factor may have on a given property. There have been a number of studies completed that examined whether HVTLs have an impact on property values. A brief summary of selected studies is provided in section 6.1.1.2.

Impacts

Route 2 would be constructed within an existing HVTL route. There are three houses located within this route. Seven houses are within 500 feet of the proposed HVTL alignment. There are seven houses in ATF Alignment 2-2 and seven houses in AFT alignment 3-2 within 500 feet of those alignments.

Route 2A would be constructed within a new HVTL route. There are 19 houses located within this route. Seven houses within 500 feet of the proposed HVTL ROW. Houses within 500 feet of the proposed HVTL alignment have the greatest potential to experience impacts on property values. However, houses closest to a new HVTL have a greater potential for property value impacts than houses near an existing HVTL.

Since the proposed HVTL alignment for Route 2 would be co-located within an existing HVTL route, houses along Route 2 are less likely to experience impacts to property values. The seven houses within 500 feet of the proposed HVTL alignment for Route 2A would likely experience greater impacts to property values because it would be a new HVTL.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid residences as much as possible. The Applicants' final ROW alignment and structure locations would strive to maximize the distance of the HVTL from homes and commercial buildings. Route 2 would be co-located within an existing HVTL route, which would minimize potential new impacts to the residences along that route.

6.2.1.3 Aesthetics

The measure of an aesthetic impact is dependent on the perception or response of an individual viewer. In forested areas, new HVTL alignments would require land clearing for a ROW of up to 130 wide, which would create a linear landscape feature. In other cases, the proposed HVTL alignment would follow existing road ROW and existing transmission line ROW. In areas where new HVTL ROW would be created, impacts to aesthetics have the potential to be greater, especially to areas such as parks, stream crossings or residences, for example. Residences closest to a new HVTL would likely experience the greatest potential for aesthetic impacts compared to residences further away or located near an existing HVTL. Additional discussion on the general potential for aesthetic and visual impacts is provided in section 6.1.1.3.

Impacts

Route 2

Seven houses are located within 500 feet of the proposed HVTL alignment for Route 2. The proposed HVTL alignment in Route 2 would utilize an existing transmission line ROW, and therefore would not create a new visual impact to houses within that route.

There are seven houses in ATF Alignment 2-2 and seven houses in AFT alignment 3-2 within 500 feet of those alignments. In both cases, construction of an HVTL would occur within an existing transmission line ROW and would not change the number of potentially impacted houses compared to the proposed Route 2 alignment.

The Hill Annex State Park boundary is approximately one mile south of the proposed HVTL alignment for Route 2. Distance, existing vegetation, and existing topography would screen the HVTL from the view of visitors to the State Park. No aesthetic impacts are anticipated to the State Park viewshed.

The Lawron Snowmobile Trail, as discussed in section 5.4.5.1, parallels proposed Route 2 for approximately two miles, following the existing transmission line ROW. New aesthetic impacts to the Lawron Snowmobile Trail are not anticipated.

Route 2A

Construction of Route 2A would occur across a primarily undeveloped natural landscape. UPM Blandin owns the majority of the land that proposed Route 2A would transect and is working the MNDNR to place conservation easements on the property. As discussed in section 5.4.5.4, the easements would restrict development, but would still allow recreation by the public and forest management and timber harvest by Blandin. The construction of the proposed HVTL would create a new visual impact to the landscape.

The Lawron Snowmobile Trail would parallel proposed Route 2A for approximately two miles near CR 328 and CR 334. Route 2A would create a new visual impact to trail users in those areas. Proposed Route 2A would also cross the snowmobile trail in potentially five locations.

Distance and visual screening by vegetation or topography all influence the potential for aesthetic impacts of new and existing HVTLs.

In addition to potential aesthetic impacts on recreationists, seven houses are located within 500 feet of the proposed HVTL centerline for Route 2A. There is also potential for recreationists on Big Sucker Lake to have a view of the proposed HVTL as it is within 500 feet of the Big Sucker Lake public access on the southwest side of the lake.

As described in section 6.2.3.2, Route 2, Route 2A, and ATF alternative alignments would result in new stream and lake utility crossings. These have the potential to create visual and aesthetic impacts to the stream corridor.

Mitigation

In addition to working with property owners and public agencies to identify concerns related to the proposed HVTL and aesthetics, the Applicants described a number of other potential mitigation measures in the Route Permit Application. These included the following for Route 2, Route 2A, and ATF alignments.

- Where feasible, the location of pole structures, ROW, and other disturbed areas would be determined by considering input from property owners or land management agencies to minimize visual impacts.
- Structure types (designs) would be uniform to the extent practical. The Applicants propose to use wood H-frame structures, which are shorter than single circuit, rather than steel poles structures, which are wider and utilize two poles. The H-frame structures are between 60 and 90 feet in height. The wood poles are usually considered less intrusive in a rural forested landscape.
- The Applicants propose to minimize natural landscape disturbance as possible; construction and operation would be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings.
- As possible, waterways would be crossed in the same location as existing linear structures, such as utility lines or transportation ROW.
- In small sections, Route 2 and Route 2A would parallel existing road ROW to minimize visual impacts to open space.
- Existing vegetation would be used to screen the transmission lines from areas of high visual sensitivity, where feasible.
- For potential impacts to the Lawron Snowmobile Trail, which would be determined after the final HVTL alignment has been decided, the Applicants would collaborate with the local snowmobile club if realignment of the existing grant-in-aid trail is required.

6.2.1.4 Noise

HVTLs can produce audible sound from transmission line conductors, which can generate electromagnetic noise known as corona. This noise, corona, is typically only loud enough to be heard in close proximity to the transmission lines.

According to modeling results, noise levels would be less than 20 dBA (i.e. noise level of a whisper) at the edge of the ROW during fair weather conditions.

The Applicants modeled conductor noise for each possible structure design configuration: H-frame, single-pole, and single-pole 230/115 kV double circuit structures. Single circuit configurations were modeled as stand-alone structures and alongside existing 115 kV transmission lines where appropriate. The MPCA noise standards were used to ensure compliance for all design and route combinations.

There are no houses located in the ROW of the proposed HVTL alignment for Routes 2 and 2A. Therefore, no impacts from noise are anticipated. Additional information on potential noise impacts from the Proposed Project are described in section 6.1.1.4.

6.2.1.5 Interference

As discussed in chapter 5, communication devices can be affected by an HVTL system through interference of the electromagnetic energy emitted at various frequencies by communication devices or their antennae. The Proposed Project has the potential to impact electronic communication (i.e., omnidirectional and unidirectional signals) within the Study Area. Potential impacts from interference with communication and mitigation measures for those impacts are discussed in the following sections.

Impacts

Omnidirectional communication signals may be impacted by the proposed HVTL from gap discharges, corona discharges, and shadowing and reflection. The potential for gap discharges leading to interference from either of proposed Route 2 or Route 2A is minimal. Due to the high frequencies of television signals, a 230 kV line seldom causes reception problems from corona discharges. The potential for shadowing and reflection from the proposed transmission line system is minimal due to the structure types, height, and spacing. There is 19.5 feet between each structure pole, approximately 800 feet between each structure, and structure heights are similar to the trees of the surrounding landscape, and therefore the HVTL system is not anticipated to block communication signals.

A 230 kV line seldom causes reception problems from corona discharges to television signals. Structure types, height, and spacing of the HVTL reduce the potential for shadowing and reflection issues.

Unidirectional communication signals, such as those utilized by microwave towers, may be impacted by the proposed HVTL if the line of site is interrupted. However, no direct or indirect impacts to unidirectional signals are anticipated as microwave towers are taller than the proposed structures.

As discussed in section 5.3.5, no impacts to FM radio, satellite television, cellular phones, or wireless internet are anticipated due to the frequency at which such signals are transmitted and received. However, the HVTL could cause interference

with AM radio signal and digital or analog television signal reception. Impacts from the Proposed Project to communication signals are expected to be minimal.

The impacts related to interference are not differential between Route 2 and Route 2A. There is the same number of residences within 500 feet of the ROW for both Routes 2 and 2A. Implementation to Route 2 of either ATF Alignment 2-2 or ATF Alignment 3-2 would not alter the potential for impacts. Section 6.2.1.1 provides a detailed discussion of proximity to structures.

Mitigation

The Applicants would inspect and repair the transmission line to maintain quality reception near the HVTL. If construction of the Proposed Project causes interference, the Applicants would work with affected residences to correct the issue. Typically the addition of an outside antenna will improve reception to a satisfactory level. The Applicants would work with microwave tower operators to avoid interrupting the signal and may include shorter structures near microwave signal directions.

6.2.1.6 Public Health and Safety

The public expressed concerns regarding potential impacts from electric and magnetic fields (EMF), induction, and stray voltage. There was also concern regarding potential impacts to implantable medical devices, general human health, and public safety from the Proposed Project. Background information on these public health and safety topics was provided in chapter 5 of this Draft EIS. The following sections provide information on the potential for impacts from the proposed HVTL and possible mitigation measures for public health and safety. Computer modeling and similar projects indicate that impacts beyond the ROW (i.e., 130 feet wide) are not anticipated from the Proposed Project.

Impacts

Electric and Magnetic Fields

Electric and magnetic fields (EMF) would be created by the Proposed Project. EMF would be created by the HVTL conductors and by substation transformers. Electric field levels produced would be below the maximum of 8.0 kV/m previously established by the Commission in the state of Minnesota. Magnetic fields produced would be at a level which is not likely to lead to electromagnetic interference.

Induction and Stray Voltage

The transmission lines constructed for the Proposed Project would produce induced currents. Based on modeling conducted by the Applicants, induced currents less than the NESC maximum standard (5 mA) would be produced beneath the proposed HVTL. Transmission lines do not create stray voltage but can induce stray voltage on a distribution circuit parallel or beneath the transmission lines. Stray voltage issues from the Proposed Project are not anticipated.

Implantable Medical Devices

As stated above, the Proposed Project would produce electric and magnetic fields. These fields have the potential to cause electromagnetic interference (EMI) in implanted cardiac devices. The

predicted magnetic fields are significantly weaker than the recommended threshold for pacemakers and ICDs set by Medtronic (a major manufacturer). The electric fields produced would be below levels at which modern devices would generally be affected. There is still the potential for EMI with some pacemakers and ICDs. The common pacemaker malfunction due to electromagnetic interference is a reversion to asynchronous mode pacing which is not life threatening or harmful. Normal operation would resume when the person moved away from the source of interference.

Human Health

Based on available literature, there is no definitive evidence that HVTLs result in impacts to human health. Studies have been unable to produce a conclusive link between HVTLs and health concerns such as childhood leukemia.

D.L. Henshaw et al. have published several papers regarding the effects of power transmission and distribution on human health. The Henshaw Effect refers to a link between the electric fields associated with HVTLs and an increased risk of cancer. Henshaw reports an increase in lung deposition from inhaling electrically charged aerosol pollutants as opposed to neutral pollutants. Corona discharges from HVTL conductors cause an ionization of the surrounding air. The ions which are released can attach to aerosol pollutants which can drift away and be inhaled by or deposited on a nearby person. Henshaw has also reported an increase in the concentration and deposition of radon decay products in the vicinity of power lines that can also increase cancer risks. Other studies have been unable to support Henshaw, and the Henshaw Effect on human health is of scientific debate.

Impacts from the Proposed Project on human health are not anticipated.

Public Safety

The proposed HVTL would be equipped with protective devices to safeguard the public and de-energize the line in the event of an accident or fallen structure or conductor.

The types of potential impacts to public health and safety are the same for both Route 2 and Route 2A. Neither ATF Alignment 2-2 nor ATF Alignment 3-2 would alter the potential for impacts.

Mitigation

Significant impacts to public health and safety are not anticipated. The Applicants would comply with local, state, and NESC standards during final design and construction of the proposed HVTL. Safety procedures established by the Applicants would be followed during and after HVTL installation, and the Applicants would implement proper safeguards during construction and operation of the HVTL. The Applicants would take appropriate measures to prevent the occurrence of stray voltage along the route. The Applicants would minimize potential health effects by maximizing the distance between the transmission lines and residences.

6.2.2 Land-based Economics

Land-based economics include the natural resources and amenities that are used to derive value from activities, such as agriculture; recreation and tourism; zoning and land use; and archaeological and

historic resources. General information was provided regarding land-based economics in chapter 5. The following sections provide analysis on potential impacts from the Proposed Project and possible mitigation measures for each proposed alignment.

6.2.2.1 Agriculture

Agricultural land that is designated as prime farmland indicates land that is most desirable for agricultural production. The Code of Federal Regulation 7 CFR 657 defines prime farmland as, "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses." Table 6-12 summarizes the acres of prime farmland soils located within the ROW of Route 2 and 2A, as well as for the ATF alignments in Route 2. Agricultural resources in the Study Area are discussed in section 5.4.1 and shown in Figure 11.

Table 6-12: Farmland Soils within ROW

Route	Farmland Soil Classification	Acres	Route Totals
2	All Areas are Prime Farmland	59.2	78.8
	Farmland of Statewide Importance	0	
	Prime Farmland, if drained	19.6	
2A	All Areas are Prime Farmland	49.3	93.6
	Farmland of Statewide Importance	7.3	
	Prime Farmland, if drained	37.0	
ATF Alignment 2-2	All Areas are Prime Farmland	59.8	79.4
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	19.6	
ATF Alignment 3-2	All Areas are Prime Farmland	59.3	78.9
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	19.6	

Source: NRCS

Impacts

The Proposed Project would result in permanent and temporary impacts to existing farmland. Temporary impacts, such as soil compaction and crop damage within the ROW are likely to occur during construction. The timing of construction would dictate the level of temporary impacts with summer or fall construction potentially leading to crop damages, while winter construction would avoid crop damages. Temporary impacts in agricultural fields are estimated to affect approximately one acre per pole during construction activities. Permanent impacts would occur as a result of structure placement on agricultural land and would be confined to the area immediately surrounding each structure, which the Applicants have estimated to be 20 sq-ft. Table 6-13 summarizes the acres of agricultural related land cover within the ROW for the proposed routes.

Table 6-13: Agricultural Land Cover within ROW

Route	Land Cover	Acres
2	Pasture/Hay	1.9
2A	Pasture/Hay	12.0
ATF Alignment 2-2	Pasture/Hay	1.9
ATF Alignment 3-2	Pasture/Hay	1.9

The majority of the mapped prime farmland areas within Routes 2 and 2A, as well as the ATF alignments to each route, are currently forested. In areas where an HVTL crosses an agricultural field or pasture, farming or grazing activities could continue around and under the HVTL. Only the areas where each H-frame wooden HVTL structure was placed would result in the loss of agricultural production. The total area of each HVTL structure is estimated to be 20 sq-ft, which is very small compared to the size of typical crop fields or pastures. Due to the small area of land that would either be lost from existing agricultural production or that would permanently impact areas of prime farmland, significant impacts to existing agriculture lands or prime farmland soils are not anticipated as a result of the Proposed Project.

Livestock may be impacted temporarily during the construction phase of the Proposed Project. There is potential of livestock to have reduced access to pasture lands, and livestock may be subjected to construction noise. Impact of stray voltage on livestock due to transmission lines is not anticipated as a result of the Proposed Project.

Mitigation

The Applicants would work with affected landowners to minimize impacts to farming operations along the route. Easements would not substantially restrict farming operations as the ROW area between structures would remain available for crop production. The Applicants would utilize previously disturbed areas for construction set-up whenever possible. The Applicants would discuss the potential temporary impacts on agricultural land and request landowner permission prior to construction. Restoration would take place following construction, and the Applicants would compensate landowners for crop damage or soil compaction. If required by the Department of Agriculture, the Applicants would work with the Department to develop an agricultural mitigation plan. The Applicants would try to avoid direct impacts to livestock farms and would work with individual landowners to minimize noise impacts to livestock and farm facilities during construction.

6.2.2.2 Mining and Forestry

As previously discussed in chapter 5, mining and forestry have been a historical use of the land in northeastern Minnesota and within the Study Area. The Proposed Project is directly related to the operation of the Essar Steel facility, which will actively mine taconite for steel production on-site once fully operational. The mining and forest products industries are part of the local economy and provide numerous jobs in the region. This section describes potential impacts to mining and forestry from the Proposed Project and potential mitigation measures, if required.

Mining

The Mesabi Iron Range runs northeast to southwest between the cities of Nashwauk and Taconite within Route 2 and 2A. Mining resources in the Study Area are discussed in section 5.4.2 and are shown on Figure 12.

Impacts

Essar Steel currently owns mining rights within the eastern one mile of Routes 2 and 2A. Construction of the proposed HVTL is necessary for Essar Steel's mining operation expansion to move forward.

Mitigation

The Applicants have selected route locations that would allow Essar Steel to mine ore resources within the Study Area. The Applicants would work with existing and future mine operators to align the proposed HVTL to limit impacts to current and planned mining operations and develop mitigation measures as necessary.

Forestry

Forests are the predominant land cover in the Study Area, including a variety of coniferous, deciduous and mixed forest lands. Forestry resources in the Study Area are discussed in section 5.4.2 shown on Figure 12.

Impacts

Land that is currently a forestry resource would be permanently impacted by the proposed HVTL. Within the ROW, forested land would be converted to a non-forest use. Forested areas would be cleared to allow for construction and operation of the transmission lines. However, the impact to forested areas is small relative to the forestry resource in the area, and the forestry economy is not likely to be affected. Table 6-14 presents detailed information regarding the forested areas within the ROW for Routes 2 and 2A, as well as the ATF Alignments 2-3 and 3-2.

Table 6-14: Forestry Impacts Within ROW

Route	Proposed Converted Acreage
Route 2	142.2
Route 2A	105.9
ATF Alignment 2-2	143.0
ATF Alignment 3-2	142.4

Mitigation

Timber harvested during construction would be made available to landowners for use as firewood, saw logs, and other uses. During construction, previously disturbed areas would be utilized for construction staging areas whenever possible. Trees and vegetation would be preserved to the maximum extent practical. Temporary access road construction would be coordinated with landowners and temporary impacts would be restored following construction. Previously forested areas, impacted by the Proposed Project, would be allowed to establish low growing species of forbs, grasses, and shrubs that would not interfere with operation and maintenance of the HVTL.

6.2.2.3 Zoning and Land Use Compatibility

The construction of a new HVTL in an area that currently does not have an existing HVTL poses a greater potential for impacts to land use and possibly zoning compatibility, as compared to constructing a new HVTL within an existing utility corridor. The Proposed Project would be located in portions of Itasca County and the cities of Nashwauk and Taconite. These local

government entities consider an HVTL a compatible land use with their current respective zoning ordinances.

Impacts

The Route 2 and Route 2A proposed alignments and the ATF proposed alignments are located in the Itasca County farm residential zoning district (Figure 13). Part of the proposed Route 2 alignment would cross through the city of Taconite municipal boundary, but would be located within an existing transmission ROW. Just prior to connecting with the Essar Steel Mine substation, the proposed HVTL alignment would be located in an industrial zoning district. According to the Itasca County zoning ordinance, special structures do not require a building permit and are not subject to setback requirements. The proposed HVTL would be considered an essential service and a compatible use.

Mitigation

The Proposed Project is compatible with the Itasca County Zoning Ordinance and the city of Nashwauk Zoning Ordinance. No mitigation would be required for the construction or operation of the Proposed Project.

6.2.2.4 Transportation and Public Services

Transportation and utility infrastructure is established in the Study Area. The Proposed Project would cross or be located adjacent to a variety of existing roadways and infrastructure within the Study Area (Figure 14). The following sections discuss the potential impacts within the proposed HVTL alignment to transportation and public services, including existing utilities, public emergency services, roadways, railways, and airports.

Existing Utilities

Impacts

Route 2 and Route 2A would not cross existing pipelines or existing HVTLs. However, proposed Routes 2 and 2A HVTL alignments would cross the state-approved NPUC gas pipeline, which has not yet been constructed. This pipeline would be located near the proposed Essar Steel Mine substation. Proposed Route 2 HVTL alignment would run parallel to this pipeline for approximately one mile within the existing 28 Line corridor before crossing the pipeline near the proposed Mine substation. Proposed Route 2A HVTL alignment would cross the pipeline near the proposed Mine substation.

Moving vehicles and cranes have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

The existing 115 kV 28 Line, which is maintained by Minnesota Power, would have the potential to be damaged during construction of proposed Route 2 HVTL alignment by equipment potentially hitting pole structures or line during collocation with the existing HVTL. The new H-frame wooden poles for the HVTL structures would be placed in augered holes approximately 10 to 15 feet deep. Minor grading may be required to provide level construction surfaces at each structure location. These construction activities would have the potential to impact existing underground utilities.

Equipment used for augering or stringing operations is tall. Moving vehicles and cranes would have the potential to impact local overhead utilities, such as collector electrical or phone systems.

When an HVTL is located adjacent to a pipeline right-of-way, the pipeline may be subject to electrical interference from electric and magnetic induction, conductive interference and capacitive effects.

Magnetic induction is the primary effect of a high voltage AC transmission line on a buried pipeline during normal (steady state) operation. Conductive interference is a concern when a transmission line fault occurs in proximity to the pipeline, as it can cause AC currents to enter the pipeline at coating holidays (i.e., flaws in the coating) and produce a voltage gradient across the pipeline coating. Capacitive effects are typically only a concern during pipeline construction when long sections of the pipeline are above ground.

If these electrical interference effects are great enough during normal operation, then a potential shock hazard exists for anyone that touches an aboveground part of the pipeline, such as a valve or cathodic protection test station. In addition, during normal operation, if the induced AC current density at a flaw in the pipeline coating is great enough, AC pipeline corrosion may occur. Lastly, damage to the pipeline coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

Although electrical interference from the close proximity of the proposed HVTL alignment to the state-approved NPUC pipeline is a possibility, no impacts are anticipated.

Mitigation

The Applicants would continue to work with existing HVTL owners along selected routes during final pole structure placement to avoid causing damage to existing transmission lines. New HVTL poles would be placed in a manner so as not to disrupt existing local and regional utilities. If necessary, the Applicants would combine the proposed HVTL with the existing HVTL onto one pole structure to eliminate further environmental impacts.

In the event that a Route Permit is granted for the Proposed Project, the Applicants would use the known locations of existing water, sewer, gas, electrical, telephone and cable lines during final engineering and design to avoid impacting these services. Upon completion of the HVTL design, the Applicants would be required to locate all of the above mentioned utilities in the field prior to HVTL construction to avoid disruption of services.

No existing pipelines would be crossed by the proposed HVTL alignments for Routes 2 and 2A. However, once the state-approved NPUC pipeline is constructed, the proposed HVTL in Routes 2 and 2A would cross it. The NPUC has indicated that if the Essar Steel natural gas pipeline ROW would share ROW with the proposed HVTL, the pipeline's design would include analysis of AC interference levels and installation of required AC mitigation to insure that the Proposed Project's high voltage AC transmission lines could be safely collocated with the gas pipeline.

The National Association of Corrosion Engineers has standards that ensure that pipeline integrity would not be degraded nor personnel safety compromised because of AC interference from a transmission line constructed and operated adjacent to a pipeline. AC interference effects can be predicted with computer modeling and if necessary, mitigation measures would be taken to minimize AC interference and reduce transmission impedance. None of the mitigation measures

would require additional ROW. A detailed description of possible mitigation measures can be found in the Route Permit Application.

Public Services

Impacts

There are no public service facilities (city of Taconite) near the proposed HVTL alignments for Routes 2 or 2A. There is potential for delay in emergency service during transmission line construction; however HVTL construction is not anticipated to cause significant or long term impacts.

The Proposed Project may temporarily increase the number of construction workers to the area, however it would not result in a measurable increase for demand on public services such as fire, police or local hospitals.

Mitigation

The Applicants would coordinate with emergency service providers to ensure that there would be no interruption in servicing capabilities. Accessibility to local residences by emergency service vehicles would be provided by stopping construction progress and rearranging equipment so the emergency vehicles could access the residences in need of those services. Once construction was completed, the proposed HVTL alignment would span state, county, and township roads, and therefore would not delay emergency vehicles or services provided.

Generally, construction activities would be staged such that public roads would be minimally impacted by lane closures or brief periods of road closures. Upon completion of construction, the HVTL would span roadways and would not delay emergency vehicles or services provided.

Highways and Roads

The construction period of the proposed HVTL would last for up to several months depending on route length, terrain, weather, and other factors. Construction traffic would use the existing county and state roadway system to access the Proposed Project and deliver construction materials and personnel. Major truck access to the Proposed Project is generally served by TH 65 and TH 169. Specific additional truck routes would be dictated by the location required for material delivery or staging.

Impacts

Construction personnel would use the existing county and state roadway system to access the proposed HVTL alignment to deliver construction materials and equipment during active construction of the HVTL. Increases in construction-related traffic on county and township roadways have the potential to damage the roadway system by exceeding functional weight capacity. Equipment used for construction of the proposed HVTL alignment could also damage existing roadways by direct damage to infrastructure.

Motor vehicle traffic in the vicinity of the Proposed Project would be temporarily impacted by the increased construction traffic during the active construction phase of the proposed HVTL

alignment. Light, medium, and heavy-duty construction vehicles, along with personal construction vehicles, would travel to and from the construction site.

Maximum traffic volumes are anticipated to occur during pole and line assembly. Traffic disruption associated with construction would be localized for short, temporary periods. At the completion of the HVTL, equipment would be removed from the site or reduced in number. HVTL construction in Route 2 or Route 2A is not be anticipated to result in permanent traffic impacts.

Route 2 would cross one CSAH and one township road. The proposed HVTL alignment would not parallel existing roadways. The AADT for each road network in Route 2 is listed below in Table 6-15.

Table 6-15: AADT for Route 2 HVTL Alignment Crossings

Road Network	AADT	Survey Year
CSAH 7	1300	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

Route 2A would cross two CSAHs, three CRs and three township roads. Route 2A would parallel CR 334 for one mile, CR 328 for 0.65 mile, and CSAH 60 for 0.65 mile. The AADT for each road network in Route 2A is listed below in Table 6-16.

Table 6-16: AADT for Route 2A HVTL Alignment Crossings

Road Network	AADT	Survey Year
CR 334	5	2005
CR 336	235	2005
CSAH 7	1300	2005
CR 328	20	2005
CSAH 60	215	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

The proposed HVTL alignment in Routes 2 and 2A would require the installation of new or temporary access roadways adjacent to the Routes in order to allow construction equipment access. Existing and new access roads would serve to connect the proposed HVTL alignments with the existing roadway system.

Long term impacts to the transportation network from the Proposed Project beyond the construction period are not anticipated.

Mitigation

Traffic management and control of local roadways would be considered in the planning and implementation. If applicable, some construction activities would require re-routing of traffic for roadway crossings during active stringing of overhead conductors.

Construction of the Proposed Project would be in accordance with all associated federal and state permits and laws, as well as industry construction standards. Transportation disruptions are anticipated to be localized, temporary and intermittent for the construction periods required to erect the pole structures. Access easement agreements would be obtained prior to construction and would be maintained to allow for access to ROW during the construction and operation of the proposed HVTL. The Applicants would also coordinate with MNDOT, Itasca County, and local

government units to obtain the necessary over width/overweight permits as needed for trucks and heavy equipment, and acquire the necessary utility crossing permits. The Applicants would also coordinate temporary road or lane closures due to materials delivery or construction, such as HVTL stringing over public roadways, with the appropriate entities.

Damage to public roads would be repaired in accordance with applicable laws and permits, and damage to private roads would be promptly repaired unless otherwise negotiated with the affected landowner. Traffic management and control of local roadways would be considered in the planning and implementation of HVTL construction, especially when crossing public roads. These measures minimize the potential for traffic disruptions. The Applicants may be required to secure a bond with the jurisdictional county or township in order to provide assurance that repairs would be made if roadways are damaged during construction of the proposed HVTL.

The Applicants would work closely with private landowners to locate HVTL access roads, while minimizing disruptions to land use or the existing rural roadway network. Similarly, close coordination with the local townships would be required to locate final ROW access roads. If loss or damage to property occurs, landowners would be compensated by the Applicants based on agreements made prior to HVTL construction.

Transporting heavy components for construction of the proposed HVTL would be dictated by seasonal roadway restrictions for the area. Mitigation for road impacts would include an agreement between the Applicants and the potentially affected community for damage to roadways associated with large truck and increased small vehicle traffic, over width/overweight vehicles, or general construction activities.

If applicable, some construction activities would require re-routing of traffic during roadway crossings during active stringing of overhead conductors to avoid traffic impacts. The Applicants would be responsible for contacting the Itasca County Sheriff's Department or local-servicing police department when crossing public roadways. Temporary guard structures would also be required to protect construction crews and the general public during HVTL construction. Guard structures would maintain necessary vertical clearance and traffic flow. The HVTL would be above ground and would span roads and highways after completion of construction.

Railways

The proposed HVTL alignments for Routes 2 and 2A would not be located near or cross railways, and therefore, no impacts would be expected. Since no impacts to railways are anticipated, mitigation has not been proposed.

Airports

There are no airports or airstrips located in close proximity to the HVTL alignments in Routes 2 or 2A. Construction and operation of the proposed HVTL for Routes 2 and 2A would not impact local airports, landing strips, or airplane safety. Therefore, no mitigation has been proposed.

6.2.2.5 Recreation

The construction of an HVTL has the potential to impact recreational resources and recreational experiences, specifically the use of snowmobile trails. This Draft EIS determined where potential

impacts to recreational resources from the Proposed Project could occur based on the proposed HVTL alignment.

Impacts

The Lawron Snowmobile Trail, as discussed in section 5.4.5.1, parallels proposed Route 2 for approximately two miles, following the existing transmission line ROW. The proposed HVTL alignment would cross the trail in three locations, where the existing transmission line currently crosses the trail (Figure 15). If construction of the proposed HVTL takes place during the winter, temporary impacts to use of the trail may occur. Also, depending on the final HVTL alignment, there is potential for minor trail realignments to be required to ensure safe snowmobile travel.

The Lawron Snowmobile Trail would parallel proposed Route 2A for approximately two miles near CR 328 and CR 334. Proposed Route 2A would also cross the snowmobile trail in potentially five locations. Similar to Route 2, temporary impacts may occur to trail users if construction of the Proposed Project were to take place during winter. Also, depending on the final HVTL alignment, there is potential for minor trail realignments to be required to ensure safe snowmobile travel.

No WMAs, SNAs, State Park or other public recreational land are located within Routes 2 or 2A. However, a large portion of Route 2A would cross land owned by UPM Blandin that is currently undeveloped and open to the public for recreation. The DNR and UPM Blandin have identified parcels of this land for conservation easements, which would restrict development, but keep the land accessible for recreation and timber management. The agreements for the easements have not been finalized, but need to be signed by December 1, 2010. A state utility license may be required for the proposed HVTL alignment for clearing ROW, placing poles, and crossing parcels that have conservation easements in place. If no conservation easement has been signed for a given parcel, then a state utility license would not be required.

Potential impacts from ATF Alignment 2-2 and 3-2 would be same as those for Route 2. The final HVTL alignment would show the potential impact to snowmobile trails and whether minor trail re-alignments would be needed.

Mitigation

The Applicants have proposed to work with local snowmobile clubs if realignment of existing grant-in-aid snowmobile trails is required in Routes 2 and 2A, or the ATF alignments.

6.2.2.6 Archaeological and Historic Resources

The construction of an HVTL has the potential to disturb land and can alter landscapes by potentially introducing a new visual impact. These impacts can potentially affect the integrity of archaeological and historic resources within a project's vicinity.

SHPO records indicate there are no sites within Route 2. In Route 2A, there are two sites identified in SHPO records that are within the proposed route and potentially within the proposed HTVL alignment ROW. These sites are IC-LAW-003: Lawrence Township Hall and IC-LAW-004: Bridge No. 7415. These sites have not been evaluated for eligibility for listing in the National Register of Historic Places (NRHP). Additional information on potential impacts to archaeological and historic resources from the Proposed Project is provided in section 6.1.2.6.

As previously discussed in section 5.4.6, there may be additional archaeological and historic resources in the Study Area that have not yet been identified or recorded by SHPO. Unknown resources have the potential to be impacted by the Proposed Project primarily during the construction phase. The Proposed Project is not anticipated to cause adverse impacts to archaeological and historic resources.

Mitigation

No adverse impacts to identified sites are anticipated. If currently unidentified sites are discovered during construction, the Applicants would coordinate directly with SHPO and would determine the proper measures to minimize or mitigate for impact to the sites.

The Applicants indicated in the Route Permit Application that the potential existence of the Native American burial mounds near Little Sucker Lake needs to be further investigated prior to construction. If burial mounds are discovered, measures to avoid and not disturb the burial mounds would be taken in accordance with Minnesota Statute 307.08.

The Applicants would also integrate into the construction bid documents a training, monitoring and discovery plan should previously unknown cultural resources or human remains be inadvertently encountered during construction. Additional detail on the training, monitoring and discover plan are provided in 6.1.2.6.

6.2.3 Natural Environment

HVTL projects typically traverse miles of land through undeveloped areas and along existing utility corridors. Natural resources typically influence the design, alignment, and construction of a new route based on topography and other natural features, such as lakes, forests, and wetlands.

Chapter 5 provided information on the existing conditions of the natural environment of the Study Area, including air quality; water resources; wetlands; flora and fauna; and rare and unique natural resources and critical habitat. Potential impacts within the proposed HVTL alignment related to the natural environment and possible mitigation measures are discussed in the following sections.

6.2.3.1 Air Quality

The Proposed Project has the potential to affect air quality in the area through corona effects and from leaks of the Greenhouse Gas SF_6 at the electrical substations. In addition, there may be limited short term emissions during construction of the transmission line. Additional information regarding potential impacts to air quality from the Proposed Project is provided in section 6.1.3.1.

6.2.3.2 Water Resources

There are a significant number of water features located within Itasca County and the Study Area. The lakes, rivers and streams in the Study Area as well as a description of the floodzones and groundwater resources are provided in section 5.5.2 of this Draft EIS (Figure 16). Construction of the Proposed Project would occur near, over and adjacent to a variety of surface and groundwater features. A discussion of the potential impacts to surface water, floodzones, and groundwater resources is provided as well as potential mitigation measures that would be required.

Impacts

Surface Water

The lakes, rivers and streams in the Study Area are listed in section 5.5.2. There are lakes located adjacent to Route 2, but there are no lakes located within Route 2. As a result there would be no lake utility crossings by the proposed HVTL alignment in Route 2. The ATF developed alternative alignments 2-2 and 3-2 within Route 2. These proposed alignments would not move the HVTL outside of proposed Route 2. As a result, the ATF Alignments 2-2 and 3-2 would not result in lake utility crossings in Route 2.

Construction of the proposed HVTLs would result in new stream utility crossings for Route 2A, but no new crossings for Route 2.

There are two lakes located within Route 2A, Big Sucker Lake and an unnamed basin (PWI 31-0124-P). The proposed HVTL alignment in Route 2A would not cross Big Sucker Lake but would cross the unnamed basin (Figure 8). This would result in a new lake utility crossing for the proposed HVTL alignment in Route 2A. There are two streams, the Prairie River and O'Reilly Creek, and an intermittent ditch that would be crossed by the proposed HVTL alignment in Route 2. However, Route 2 follows the ROW of the existing 28 Line for the majority of its route. The existing 28 Line crosses both O'Reilly Creek and the intermittent ditch. This would result in an additional HVTL line crossing these two streams in Route 2 but would not create new utility crossings. A new stream utility crossing would be created, however, at the Prairie River by the proposed HVTL alignment for Route 2. Three total stream utility crossings would be created by the proposed HVTL in Route 2, but only the crossing of the Prairie River would be a new crossing. The ATF Alignment 2-2 would cross the Prairie River slightly to the west of the Applicants' proposed alignment but would not result in additional stream crossings. The ATF Alignment 3-2 would cross O'Reilly Creek and the intermittent ditch but would not result in additional stream crossings.

There are five streams that cross through Route 2A, including the Prairie River, Sucker Brook and three unnamed tributaries to Sucker Brook. All five streams would be crossed by the proposed HVTL alignment. This would result in a total of five new stream utility crossings for the proposed HVTL alignment in Route 2A.

Impacts to surface waters from the construction of the Proposed Project could occur as a result of vegetation clearing within the ROW, as well as site grading and structure placement at each of the transmission line pole locations. These project related activities could result in erosion that could lead to sediment runoff into adjacent lakes, rivers or streams. Impacts are most likely to occur at HVTL construction or ROW clearing locations adjacent to water bodies or at stream or lake utility crossings. There would be some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to local surface waters.

Floodzones

The FEMA defined floodzones that are located within Routes 2 and 2A are associated with the Prairie River. The HVTL alignment proposed by the Applicants would cross the Prairie River, and the associated floodzones, within Route 2 and Route 2A. Within Route 2, the Prairie River floodzone is approximately 300 feet wide at the location of the HVTL crossing based on the Applicants' proposed alignment. The floodzone is the same width at the location of the Prairie River crossing for the ATF Alignment 2-2.

Using a spacing distance of 600 to 1,000 feet, H-frame wooden poles proposed by the Applicants would be used to construct the HVTL. Based on this pole spacing distance it is likely that placing a pole within the Prairie River floodzone could be avoided. However, until final engineering and design is complete it is not known if an HVTL pole would be placed within the Prairie River floodzone. The Prairie River floodzone is relatively narrow at the proposed stream crossing, restricting HVTL pole placement to one or less poles within the floodzone.

The Route Permit Application indicates that the total area temporarily disturbed by the placement of a single HVTL H-frame wooden pole would be approximately one acre. The permanent impacts associated with each H-frame pole structure are conservatively estimated to be 50 sq-ft, which is considerably less than the temporary impacts. Impacts of 50 sq-ft within the floodzone of the Prairie River would not result in measurable changes to flood storage volumes or alterations of flow pathways. No impacts to the floodzone of the Prairie River are anticipated from the construction of the HVTL within Route 2.

The Prairie River floodzone width at the proposed HVTL alignment crossing within Route 2A is approximately 1,500 feet. Based on the Applicants' estimated pole spacing for the HVTL with wooden H-frame poles, it would not be possible to avoid placing a transmission line pole within the Prairie River floodzone at this stream crossing. Based on the proposed pole spacing of 600 to 1,000 feet the least number of poles placed within the floodzone would be one, and the most poles placed within the floodzone would be two. This would result in temporary impacts to two acres of land and permanent impacts of approximately 100 sq-ft within the Prairie River floodzone for the HVTL alignment within Route 2A. Impacts of 100 sq-ft within the floodzone of the Prairie River would not result in measurable changes to flood storage volumes or alterations of flow pathways. No impacts to the floodzone of the Prairie River are anticipated from the construction of the HVTL within Route 2A.

Groundwater

The Study Area is located within the groundwater recharge area known as the Mississippi River Headwaters (HA-278). Within this area, bedrock is typically located between five and over 500 feet below the ground surface. Groundwater aquifers in this region are typically five to 50 feet in thickness within gravel soils located from 50 to 500 feet below the land surface. The proposed wooden H-frame transmission line poles would be placed in augered holes at depths of 10 to 15 feet below the surface. Therefore the HVTL poles would not intercept groundwater aquifers in the area. Additionally due to the depth of the local groundwater aquifer, it is unlikely that temporary dewatering would be required during HVTL construction. There would be some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to the local groundwater aquifer.

Mitigation

The Applicants would be required to obtain permits from the MNDNR and MPCA for potential impacts to surface waters.

The Applicants would be required to obtain a permit from the MNDNR for the lake and stream utility crossings associated with Route 2 or Route 2A. It is unlikely that the MNDNR permit would allow the placement of HVTL poles within streambeds or lake beds. However, if upon completion of final HVTL design it was determined that it would not be

possible to avoid placement of HVTL poles within a stream or lake bed, the Applicants would also be required to obtain a work in public waters permit from the MNDNR. This permit would require the Applicants to provide a plan for minimizing disturbance of habitat and water quality within the stream or lake during construction.

The Proposed Project would disturb more than one acre of land and as a result would be required to obtain an NPDES construction permit from the MPCA. The NPDES permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP). Within the SWPPP the Applicants would be required to identify specific construction BMPs that would be implemented to minimize impacts to the water quality of surface waters adjacent to or within the HVTL construction ROW. Construction BMPs would include items such as silt fences, bio-roles, staked bales or silt curtains. Once construction is complete, the disturbed areas would be restored to the previous vegetation condition if possible. In the case of forested lands, vegetation would be replaced with an approved native grass seed mixture to establish suitable low height vegetative cover. Upon completion of vegetation restoration within the ROW, sediment runoff would be similar to conditions prior to construction. The implementation of the construction BMPs in the SWPPP would ensure minimal impacts to water quality of adjacent water bodies.
Floodzones associated with the Prairie River would be crossed by the construction of the HVTL within either Route 2 or Route 2A, as would the ATF Alignment 2-2. The overall impacts to the function of floodplain from construction of HVTL structures would not be measurable. However, it would be important to avoid storing hazardous materials, such as diesel fuel tanks, or other construction related materials within the floodplain. These details would be covered under the construction SWPPP for the Proposed Project. Care should also be taken during ROW clearing and vegetation establishment to minimize the temporary impacts to floodplain habitat.

Groundwater aquifers are located below the depth of construction for the HVTL poles. The NPDES construction permit that would be required for the Proposed Project would address the handling of stored construction materials, including items such as diesel fuel or transmission fluid. If a spill occurs, the Applicants would be required to implement the measures identified in the NPDES construction permit to minimize impacts to surface water or groundwater resources. In the event of a spill of more than five gallons, the Applicants would be required to contact the MPCA state duty officer and then would be required to conduct spill remediation activities as directed by the duty officer.

6.2.3.3 Wetlands

The Proposed Project is located in Itasca County, which has an abundance of wetlands of varying types. Chapter 5 of this Draft EIS provides information on the wetlands located within the Study Area (Figure 17). The following sections discuss potential impacts to wetlands located within the proposed HVTL alignments and possible mitigation measures for impacts to those wetlands.

Impacts

Wetlands within Route 2 and 2A were identified using NWI data in section 5.5.2 and are displayed in Figure 8. The regulatory framework in regard to wetlands is also described in section 5.5.2.

The proposed HVTL alignment encompasses a 130 foot wide ROW within each route. Table 6-17 compares and summarizes wetland areas within each proposed HVTL 130 foot ROW by total wetland area and by wetland type.

Table 6-17: Wetlands Within Route 2 and Route 2A Proposed HVTL ROW

Route	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Total Wetland Area (acres)
Route 2	0.0	0.0	0.7	0.0	0.0	11.9	26.9	17.7	57.1
ATF Alignment 2-2	0.0	0.0	0.7	0.0	0.0	11.9	25.0	18.5	56.0
ATF Alignment 3-2	0.0	0.0	0.7	0.0	0.0	11.9	26.9	17.7	57.1
Route 2A	0.0	1.7	0.0	0.0	0.9	17.0	13.4	2.5	35.4

Three types of wetland impacts would potentially occur from the Proposed Project: permanent impacts, temporary impacts, and conversion of wetland type. Impacts would be quantified by the Applicants prior to construction.

Permanent impacts would occur from dredging or filling during installation of structures associated with the HVTL. The Route Permit Application indicates that the construction of an H-frame wooden HVTL structure impacts 20 sq-ft of land. Permanent impacts to wetland encompassing approximately 20 sq-ft per structure would occur from filling activities that would be necessary wherever a structure would be installed within a wetland. Structures would be installed within wetlands that could not be avoided by the H-frame structure spacing, which would vary from 600 to 1,000 feet.

Temporary impacts to wetlands within the proposed HVTL alignment would occur from construction activities within the wetland basins including temporary vegetation removal or soil compaction. Temporary impacts would be caused by crossing the wetland during construction of the HVTL.

Impacts classified as conversion of wetland type would occur wherever vegetation is permanently cleared within the HVTL ROW. Woody forested vegetation would likely be the only vegetation type that would be permanently cleared. As a result, the Proposed Project would potentially convert wetland types with woody vegetation, shrub swamp (Type 6) and wooded swamp (Type 7), into wetland types such as wet meadow (Type 2) or shallow marsh (Type 2) that would have similar hydrologic regimes but would be dominated by non-woody species.

Shrub swamp (Type 6) and wooded swamp (Type 7) are wetland types containing woody vegetation found in Route 2 and Route 2A that would be potentially converted to a different wetland type. As shown in Table 6-17, the proposed HVTL ROW in Route 2A contains less total area of wetland than Route 2 and the alternative alignments in Route 2. The area of shrub swamp and wooded swamp is also less in Route 2A, with a combined area of 30.4 acres in Route 2A and combined areas ranging from 36.9 to 38.8 acres in Route 2 and Route 2 alternative alignments.

Indirect wetland impacts would potentially occur if impacts outside of the HVTL ROW are caused by Project activities. They would result from a direct physical alteration that occurs within the HVTL ROW (filling, excavation, vegetation clearing) that may indirectly affect characteristics of wetlands, such as vegetation type, hydrology, or wetland functions, outside of the HVTL ROW.

Mitigation

Regulatory agencies with jurisdiction over wetlands within the Study Area are identified in section 5.2.2. Regulatory processes require documentation of existing wetland boundaries, quantification of proposed wetland impacts, and documentation of project sequencing. Project sequencing includes wetland impact avoidance and minimization efforts, as well as proposed mitigation for unavoidable impacts.

For unavoidable wetland impacts, the permitting process determines the wetland mitigation ratio and type of wetlands created.

Unavoidable impacts to wetland from the Proposed Project must be mitigated as required by state and federal regulatory requirements. The mitigation ratio (the amount of wetland that must be created to replace impacted wetlands) is determined in the permitting process. The process also ensures that equivalent wetland types are created.

The mitigation ratio is also influenced by a number of other considerations, including:

- the type of impact (i.e., permanent, temporary or conversion of type);
- whether mitigation is completed concurrently or prior (in-advance) to wetland impacts;
- location of the mitigation wetlands relative to the impact wetlands (in-place);
- the type of mitigation wetlands relative to the impact wetlands (in-kind);
- the type of mitigation proposed, such as creation, restoration, or preservation; and
- winter time construction may be considered in an effort to minimize impact to vegetation communities.

The overall goal of the regulations is to replace wetland impacts with wetlands that are of the same type, provide similar functions, and are of comparable or better quality compared to the impacted wetlands.

Permanent wetland impacts within Route 2 and Route 2A would be quantified by the Applicants, and a wetland replacement plan would need to be submitted to regulatory agencies and approved prior to the start of construction. The Applicants would avoid permanent wetland impacts within Route 2 and 2A by spanning wetlands wherever possible. Where wetlands are too large to span and construction of structures are necessary in the wetland, the Applicants would minimize wetland impacts to the greatest extent possible. The Applicants have also committed to additional minimization efforts that are identified in the Route Permit Application.

Temporary wetland impacts would occur within Route 2 and Route 2A where wetlands would need to be crossed during HVTL construction. Temporary impacts are regulated differently by state and federal agencies. WCA allows for temporary impacts for up to six months without requiring mitigation as long as areas are restored to original conditions at the completion of construction. The USACE has required permanent wetland replacement for temporary impact to wetlands (six months or less) in the past for other projects. The replacement ratios used by the USACE for temporary wetland impacts typically range from 0.1:1 to 0.5:1. Potential temporary wetland impacts would need to be quantified by the Applicants prior to the start of construction. Areas of temporary wetland impact would be restored as required at the completion of construction activities.

The USACE may regulate the temporary or permanent conversion of wetland type by requiring mitigation at a ratio generally ranging from 0.1:1 to 0.5:1, depending on the type of wetland that is impacted. Generally, the USACE would be most concerned with the conversion of wetlands of

Type 6 and Type 7 basins to wetland types containing non-woody vegetation. The USACE may require a case-by-case evaluation to determine the required compensation for wetland impacts.

WCA does not specifically regulate conversion of wetland type through the clearing of vegetation if the activity does not involve draining, filling, or excavating. Itasca County SWCD, as the responsible WCA agent, has the authority to interpret whether activities associated with clearing constitute draining, filling, or excavating result in impacts, and therefore would require mitigation.

Indirect impacts to wetlands would be avoided by the Applicants by using sound construction practices. According to the Route Permit Application, these practices would be detailed in the NPDES permit and SWPP that would be completed prior to the start of construction.

6.2.3.4 Flora and Fauna

The Proposed Project would result in the alteration of the vegetation and wildlife habitat conditions in the Study Area. Alterations would occur through the establishment and maintenance of ROW and the construction of new HVTLs. A description of the potential impacts to vegetation, wildlife habitat, wildlife populations and fisheries resources, along with required mitigation, is provided in this Draft EIS.

Impacts

Vegetation

The Applicants have proposed to establish 130 foot wide ROW for construction and operation of the proposed HVTL. Land cover within the Study Area is presented in Figure 18. An analysis of the land cover and vegetation communities within the new 130 foot ROW was conducted for the proposed HVTL alignments in Route 2 and Route 2A. An additional analysis of the vegetation was conducted for Route 2 including ATF Alignment 2-2 and ATF Alignment 3-2. The vegetation communities within the 130 foot ROW for each of the four alignment alternatives are presented in Table 6-18.

Table 6-18: 2008 NASS Land Cover Analysis for Each HVTL Alignment

Land Cover Class	Route 2 Alignment	ATF Alignment 2-2	ATF Alignment 3-2	Route 2A Alignment
Deciduous Forest	128.8	131.3	129.0	98.1
Developed	1.5	1.5	1.5	14.2
Evergreen Forest	13.4	11.8	13.4	7.8
Grassland	0.1	0.6	0.1	0.4
Herbaceous Wetlands(1)	5.1	5.1	5.1	14.4
Open Water	0.0	0.0	0.0	2.5
Pasture/Hay/Crop	1.9	1.9	1.9	12.0
Shrubland	2.9	2.9	2.9	1.4
Woody Wetlands(1)	15.6	14.8	15.6	2.0
Total(2)	169.4	169.9	169.6	152.8

(1) NASS wetland categories do not match NWI wetland classifications used for detailed analysis of wetland impacts in section 6.2.3.3.
(2) ATF Alignments 2-2 and 3-2 add length to the overall HVTL which result in different land cover totals within the 130 ft ROW.

The establishment of new ROW for the construction of the proposed HVTL would result in clearing of trees within forested lands, including woody wetlands. After construction of the HVTL, a new low lying native ground cover would be established within the HVTL ROW. This would result in the loss of forested vegetation. For the other land cover types, such as grasslands, shrublands and herbaceous wetlands, the establishment of new ROW and construction of the proposed HVTL would have less of an impact on the vegetation community. Vegetation within grasslands and herbaceous wetlands would be reestablished with vegetation communities similar to the existing vegetation. For shrublands some taller shrubs may be permanently removed, but in general this vegetation community would not be significantly altered by the establishment of the new ROW and construction of the proposed HVTL.

Another potential impact to vegetation communities during ROW clearing and construction would be the introduction or spread of invasive plant species or noxious weeds. When established vegetation is cleared for a construction project, invasive or noxious weeds can become established because they are typically early colonizing species that grow quickly on disturbed areas. Under worse case situations, once established invasive plant species alter habitats and reduce biodiversity (USDA, 2008). Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds.

Wildlife

Wildlife habitat would be altered as a result of the Proposed Project. The most significant alterations would occur in the form of ROW clearing within forested lands. Forested areas would be cleared of trees that would interfere with the operation and maintenance of the HVTL. The conifer and deciduous forest communities would be replaced with a low lying vegetative cover, consisting mainly of grasslands. The acres of forested lands within the 130 foot ROW of the proposed HVTL alignment in Route 2, Route 2A and the routes including the ATF alignments are presented in Table 6-18. However, this land would not be completely lost as wildlife habitat as would be the case if the land was converted to urban or industrial uses. Instead it would simply be altered to a different vegetation community. The establishment of a new grassland community in the HVTL ROW would provide additional habitat for some wildlife species.

Clearing the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area.

Clearing of the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area. Large equipment would create noise causing wildlife to avoid the area temporarily. However, the 130 foot ROW is relatively narrow compared to the large habitat tracks that are within the Study Area and adjacent to the HVTL alignments. The majority of wildlife within the Study Area and along the Iron Range has become accustomed to human disturbance from logging, mining or other human developments. As a result, the wildlife living within the overall Study Area and along the proposed HVTL alignments would likely disperse to available adjacent habitat. In general the amount of habitats that would be impacted by the construction of the Proposed Project is small compared to the amount of available habitat in the Study Area.

The use of large construction equipment to clear the ROW and construct the HVTL may result in some local mortality to wildlife that is not able to quickly disperse to available adjacent habitat. Small or slow moving birds, mammals, amphibians and reptiles may not be able to avoid the large, fast moving, mechanized equipment. This has the potential to disturb or destroy nests or

burrows with juvenile wildlife that is incapable of dispersing and may also result in direct mortality to some species. However, due to the relatively narrow width of the 130 foot ROW compared to the large habitat tracts in the Study Area and Itasca County, wildlife mortality would be to local individuals and is not anticipated to result in population level impacts. In general, the impacts to wildlife habitat and wildlife populations from the Proposed Project are expected to be small.

Fisheries

H-frame structures would be 600 to 1000 feet apart, which would allow for spanning of most lakes, rivers and streams crossed by the HVTL.

The construction of the proposed HVTL would result in new water body crossings. The lakes and streams that would be crossed by the proposed alignments for Route 2, Route 2A and the ATF alignments are described in section 6.2.3.2. The clearing of the HVTL 130 foot ROW and grading to construct HVTL structures has the potential to result in sediment erosion or water quality impacts to adjacent lakes and streams.

The spacing of the H-frame wooden transmission line structures proposed by the Applicants would be 600 to 1000 feet. This would allow the Applicants to span most lakes, rivers and streams crossed by the proposed HVTL alignments, limiting impacts to aquatic habitat or water quality. Transmission pole structures placed within stream or lake beds, or immediately adjacent to lakes or streams would have the greatest potential of resulting in sedimentation, water quality impacts or alteration of aquatic habitat. The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings in Minnesota. These required permits would limit or eliminate the placement of HVTL structures within lakes or streams. After completion of ROW clearing and HVTL construction low lying vegetative cover would be established within the ROW which would return the land to a condition similar to pre-construction. The establishment of new vegetation within the ROW would minimize or eliminate the potential for long term water quality or sediment impacts from the Proposed Project. Overall, the impacts to water quality and aquatic habitat from the Proposed Project are expected to be small.

Mitigation

The construction of the Proposed Project, including the establishment of new ROW and construction of the HVTL, would result in impacts to wildlife habitat and may result in impacts to local wildlife populations, water quality or aquatic habitat. During public scoping for this Draft EIS, residents identified concerns over impacts to mature forest stands. In the event the a Route Permit is granted for the Proposed Project the Applicants would work directly with land owners during the easement acquisition process to identify habitat or forest concerns and make appropriate adjustments to the HVTL alignment to minimize the loss of mature forests. Impacts to wetland habitats would require a permit from Itasca County and/or the USACE prior to construction, which would require the development of an acceptable mitigation strategy to offset wetland habitat impacts from the Proposed Project. Additionally, the Applicants would be required to conduct field surveys to delineate wetlands or identify sensitive biological resources and/or habitats for the selected routes. The results of the field surveys would be potentially used to alter the HVTL alignment in order to minimize the overall impacts to vegetation, wildlife habitats or wetlands.

The ROW clearing for the Proposed Project may result in the spread or introduction of noxious weeds or invasive plant species. Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds. The Applicants have stated in the Route Permit Application that prior to construction, a designated inspector would conduct a field review for noxious weeds in areas designated for ROW, construction or staging activities. The Applicants would attempt to control the spread of noxious weeds during construction. Additionally, the Applicants would comply with all noxious weed laws in Minnesota and would control noxious weeds that are found in the ROW during vegetation maintenance activities.

The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings. These permits would limit or eliminate the placement of HVTL structures within streams or lakes and would identify measures that would be required to reduce impacts to water bodies during the construction of utility crossings. Prior to construction, the Applicants would be required to obtain an NPDES construction permit and develop a SWPPP for the Proposed Project. The NPDES permit and SWPPP would identify construction practices and BMPs that would be followed to limit habitat disturbance and minimize or eliminate impacts to water quality and aquatic habitat.

6.2.3.5 Rare and Unique Resources and Critical Habitat

The Proposed Project would result in the disturbance of vegetation communities within the Study Area, including forests, grasslands and wetlands. Some of these communities would be altered, which could result in an impact to habitat required by threatened, endangered or rare plants or animals. The known existing threatened and endangered plants and animals in the Study Area are discussed in section 5.5.5 of this Draft EIS.

Impacts

Construction of the proposed HVTL for Routes 2 and 2A would result in the creation of new utility ROW. Establishment of new ROW and construction of the proposed HVTL would result in crossing water bodies and impacts to wetland and forest communities. However, there are no known records of state or federally listed threatened, endangered or special concern plant species within Route 2 or Route 2A. As a result, the establishment of ROW and construction of the proposed HVTL in Route 2 or Route 2A would not result in impacts to threatened, endangered or special concern plant species.

There are no records of state or federally listed threatened or endangered animal species within Route 2 or Route 2A. There are known records of one special concern species, the black sandshell, within Route 2 and 2A. The black sandshell is a mussel species documented to occur within the Prairie River (Figure 19). The proposed HVTL alignments for Route 2 and Route 2A would cross the Prairie River. The inclusion of the ATF alignments would not eliminate the crossing of the Prairie River.

Mitigation

Crossing of the Prairie River by the proposed HVTL in Route 2 or Route 2A would require a utility crossing permit from the MNDNR. Due to the presence of the special concern mussel species, the black sandshell, it is unlikely the transmission pole structures would be allowed to be placed within the river bed. Additionally, the Applicants would be required to develop a SWPPP as part of the required NPDES construction permit for the Proposed Project. Construction BMPs

would be identified in the SWPPP that would address necessary measures to prevent erosion, sedimentation and impacts to water quality for construction adjacent to or across water bodies. The Applicants may be required to provide additional BMPs at crossings of the Prairie River to ensure that habitat for the black sandshell is not impacted during construction of the proposed HVTL.

If upon completion of final engineering and design, it was determined that it is not possible to avoid placing transmission pole structures within the bed of the Prairie River, the Applicants would be required to consult with the MNDNR to determine potential impacts to the black sandshell. Impacts to special concern species would not require a takings permit from the MNDNR as special concern species are not afforded the same protection under Minnesota's endangered species statutes. Detailed field surveys at river crossings locations may be required to define mussel beds within the Prairie River. The Applicants would be required to develop minimization measures to avoid mussel beds and potentially a mitigation plan if it was determined the Proposed Project would directly impact the black sandshell or other sensitive mussel species in the Prairie River.

Table 6-19: Routes 2 and 2A and ATF Alignment Summary of Potential Effects

Topic	Route 2 (Preferred)	Route 2A (Alternate)	ATF Alignment 2-2	ATF Alignment 3-2	Summary of Potential Impacts
Effects on Human Settlement					
Proximity to Structures/Displacement	Seven homes within 500 ft. of the proposed HVTL.	Seven homes within 500 ft. of the proposed HVTL.	Seven homes within 500 ft. of the proposed HVTL.	Seven homes within 500 ft. of the proposed HVTL.	No difference in number of homes between Routes or alignments. No displacement would occur.
Property Values	Impacts to property values can not be determined with certainty, but are tied to a number of factors, including condition of the property, housing market, proximity to the HVTL, aesthetics, and buyer's opinion.				
Aesthetics	The Proposed Project would introduce a new visual impact for those homes closest to the proposed alignment that do not have vegetative or topographical barriers as visual screening. Visual impacts may also be created at water body or trail crossings.				
Noise	The Proposed Project would not exceed MPCA noise standards. Noise is anticipated to be minimal to inaudible beyond the proposed HVTL alignment ROW. There are no houses located within the ROW of Route 2, Route 2A or the ATF alignments.				
Interference	Impacts to omnidirectional and unidirectional signals are expected to be minimal from the Proposed Project. Some disruption of AM radio or analog television signals may occur but would only likely occur directly below the HVTL.				
Public Health and Safety	Impacts to public health and safety from the Proposed Project are not anticipated. The Applicants would comply with all local, state and NESC safety standards during design, construction, operation and maintenance of the proposed HVTLs.				
Effects on Land-based Economics					
Agriculture	1.9 acres of agricultural lands within ROW.	12.0 acres of agricultural lands within ROW.	1.9 acres of agricultural lands within ROW.	1.9 acres of agricultural lands within ROW.	Farming and grazing activities could continue around and under HVTL. A very small amount of agricultural land would be lost to production.
Mining and Forestry	142.2 acres of forested lands within ROW.	105.9 acres of forested lands within ROW.	143.0 acres of forested lands within ROW.	142.4 acres of forested lands within ROW.	Forested lands would be lost from timber production due to ROW clearing. Impacts would be small compared to regional forest resources.
Zoning and Land Use Compatibility	The proposed HVTLs are a compatible use within Itasca County and the city of Nashwauk. Zoning or land use variances or special permits would not be required.				
Transportation and Public Services	The Proposed Project would not impact local public services such as police, fire or medical. Some temporary road closures during construction may require coordination with local emergency services. The Applicants would obtain local and MNDOT permits for all road utility crossings. Traffic patterns may experience temporary disruption during construction but would not be permanently altered. Railroad and airport use would not be disrupted.				

Topic	Route 2 (Preferred)	Route 2A (Alternate)	ATF Alignment 2-2	ATF Alignment 3-2	Summary of Potential Impacts
Recreation	Three new snowmobile trail crossings.	Five new snowmobile trail crossings.	Three new snowmobile trail crossings.	Three new snowmobile trail crossings.	Minor trail realignments may occur. Temporary impacts to trail use could occur with winter construction.
Archaeological Resources	There are no historic or archeological sites near Route 2 or the ATF alignments. In Route 2A, there are two sites that are near the proposed HVTL alignment. No adverse impacts to identified sites are anticipated. The Applicants will investigate the potential presence of native burial mounds near Little Sucker Lake. The Applicants will coordinate with SHPO in the event that archaeological resources are discovered during HVTL construction.				
Effects on the Natural Environment					
Air Quality	Temporary fugitive dust impacts would occur during construction but are expected to be minor. Construction and operation of the HVTL would not be a significant source of air emissions.				
Water Resources	No lake utility crossings and three stream utility crossings would result from HVTL alignment.	No lake utility crossings and five stream utility crossings would result from HVTL alignment.	No lake utility crossings and three stream utility crossings would result from HVTL alignment.	One lake utility crossing and three stream utility crossings would result from HVTL alignment.	MNDNR permits would be required for public water utility crossings. The Proposed Project would not impact groundwater resources. Impacts to the Prairie River floodzone would be minimal. BMPs would be implemented during construction to minimize water quality impacts.
Wetlands	57.1 acres of wetlands and 38.7 acres of forested wetlands within ROW.	35.4 acres of wetlands and 30.3 acres of forested wetlands within ROW.	56.0 acres of wetlands and 36.9 acres of forested wetlands within ROW.	57.1 acres of wetlands 38.7 acres of forested wetlands within ROW.	Wetland impacts for the Proposed Project would require a permit from Itasca County SWCD and/or the USACE. A mitigation plan would be required to offset impacts to wetlands basins or vegetation.

Topic	Route 2 (Preferred)	Route 2A (Alternate)	ATF Alignment 2-2	ATF Alignment 3-2	Summary of Potential Impacts
Flora and Fauna	142.2 acres of forested habitat would be impacted.	105.9 acres of forested habitat would be impacted.	143.0 acres of forested habitat would be impacted.	142.4 acres of forested habitat would be impacted.	Forested habitat would be lost as ROW is cleared. Impacts, including mortality may occur to local wildlife but would not result in population level impacts
Rare and Unique Resources/Critical Habitat	No known threatened or endangered plant or animal species within HVTL alignment. A species of special concern (black sandshell) is known to occur in the Prairie River.	No known threatened or endangered plant or animal species within HVTL alignment. A species of special concern (black sandshell) is known to occur in the Prairie River.	No known threatened or endangered plant or animal species within HVTL alignment. A species of special concern (black sandshell) is known to occur in the Prairie River.	No known threatened or endangered plant or animal species within HVTL alignment. A species of special concern (black sandshell) is known to occur in the Prairie River.	The Applicants would be required to conduct surveys to determine extent of black sandshell populations in the Prairie River if HVTL structures would be placed within the river. If impacts to sensitive mussels could not be avoided the Applicants would consult with the MNDNR on appropriate mitigation.

6.3 BLACKBERRY SUBSTATION TO ESSAR STEEL PLANT SUBSTATION

Route 3 and 3A would provide power to Essar Steel from the Blackberry substation located south of the facility (Figure 9). Route 3 and 3A would begin at the Blackberry substation, which would require some modifications to this substation. Route 3A is wide enough to allow for shifting of the preliminary alignment within the route to avoid impacts to residences or sensitive resources. Additionally, ATF alignments have also been identified, which give further consideration to residences and other factors in both Route 3 and Route 3A.

6.3.1 Human Settlement

Background information on human settlement, which described existing conditions related to development patterns and the community, was provided in chapter 5. This section of the Draft EIS provides information on the potential impacts to human settlement from construction and operation of the Proposed Project, including proximity to structures and potential displacement; property values; aesthetics; noise; interference to radio, television, internet or cellular phones; and public health and human safety related to electric and magnetic fields, implantable medical devices, and stray voltage. Mitigation measures for each of the topic areas are also provided.

6.3.1.1 Proximity to Structures and Displacement

Displacement occurs when a residence is located at a distance that would interfere with the safe operation of a transmission line. HVTL projects have the potential to result in displacement depending on project area conditions and densities of commercial or residential properties within an HVTL route. Utilities typically do not allow residences or businesses within the final ROW easement.

Displacement results during ROW acquisitions where property currently occupied by a residence or business is required for the HVTL ROW. Typically the Applicants would request an easement to use a narrow strip of land within a property. However, ROW acquisition is regulated by Minnesota Statutes Section 216E.12, subd. 4. This statute gives a property owner the option to require the Applicants to purchase, at fair market value, an entire property that is crossed by an HVTL. Eligibility to exercise this right depends on property classification under Minnesota Statute Section 273.13 and capacity ($\geq$ 200 kV) of the HVTL.

Impacts

The Applicants provided a dataset identifying residences in the Study Area. Residences were identified through field observation/confirmation, analysis of high resolution aerial photography, and discussions with the public by the Applicants. The residences within the proposed 130 foot ROW for Routes 3 and 3A were identified using the dataset provided by the Applicants. The number of homes within 500 feet of the proposed route centerlines was also examined. Table 6-20 summarizes the results of this analysis.

Table 6-20: Number of Residences Proximate to Proposed Alignment

Route		Within ROW	Within 500' of Centerline
3	**Proposed**	1	16
	ATF Alignment 2-3	0	17
3A	**Proposed**	0	8
	ATF Alignment 2-3A	0	5
	ATF Alignment All-3A	0	4

Additional residences were identified by the public and ATF following submittal of the Route Permit Application. The Applicants' proposed Route 3 alignment would place a residence within the ROW. This could potentially lead to displacement. This home was not mapped during the Route Permit Application process, and therefore was not considered by the Applicants. ATF Alignment 2-3 proposes to narrow the proposed HVTL corridor along Highway 70 to avoid the home within the ROW. If the ATF alignment were implemented, this home would remain within 500 feet of the HVTL centerline, but would be outside of the ROW.

ATF Alignment 2-3A shifts a southern portion of the route to the east to avoid private homes and highlands and would reduce the number of homes in proximity by three. ATF Alignment All-3A shifts the southern portion even further to the east for the same purposes as ATF Alignment All-3A and would reduce the number of homes in proximity by four.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid the need for displacement. However, Route 3 places a home within the 130' ROW. If the ATF Alignment 2-3 were implemented, the home would no longer be within the ROW, and there would be no need for displacement. The construction of Route 3 or Route 3A is not anticipated to cause displacement of residences or businesses. The Applicants final ROW alignment and structure locations would maximize the distance of the HVTL from homes and commercial buildings.

6.3.1.2 Property Values

During scoping for this Draft EIS, concerns were raised regarding whether the Proposed Project would have a negative impact on property values. As previously discussed in chapter 5 of this Draft EIS, property values are dependant on a number of factors, so it can be difficult to determine the affect one factor may have on a given property. There have been a number of studies completed that examined whether HVTLs have an impact on property values. A brief summary of selected studies is provided in section 6.1.1.2.

Impacts

Route 3 would be constructed within an existing HVTL route. There are five houses located within this route. Sixteen houses are within 500 feet of the proposed HVTL alignment for Route 3. There are seventeen houses within 500 feet of ATF Alignment 2-3.

Route 3A would be constructed within a new HVTL route. There are 31 houses located within this route. Eight houses are within 500 feet of the proposed HVTL alignment. Additionally, there are five houses in ATF Alignment 2-3A and four houses in AFT alignment All-3A within 500 feet of those alignments. Houses within 500 feet of the proposed HVTL alignment have the greatest potential to experience impacts on property values.

Since the proposed HVTL alignment for Route 3 would be collocated within an existing HVTL route, houses along Route 3 are less likely to experience impacts to property values. The eight houses within 500 feet of the proposed HVTL alignment for Route 3A would likely experience greater impacts to property values because it would be a new HVTL.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid residences as much as possible. The Applicants' final ROW alignment and structure locations would strive to maximize the distance of the HVTL from homes and commercial buildings. Route 3 would be collocated within an existing HVTL route, and would minimize potential new impacts to the residences along that route. Route 3A would use some collocating within existing HVTL routes, but would also create new ROW.

6.3.1.3 Aesthetics

The measure of an aesthetic impact is dependent on the perception or response of an individual viewer. In forested areas, new HVTL alignments would require land clearing for a ROW of up to 130 wide, which would create a linear landscape feature. In other cases, the proposed HVTL alignment would follow existing road ROW and existing transmission line ROW. In areas where new HVTL ROW would be created, impacts to aesthetics have the potential to be greater, especially to areas such as parks, stream crossings or residences, for example. Residences closest to a new HVTL would likely experience the greatest potential for aesthetic impacts compared to residences further away or located near an existing HVTL. Additional discussion on the general potential for aesthetic and visual impacts is provided in section 6.1.1.3.

Impacts

Route 3

Sixteen houses are located within 500 feet of the proposed HVTL centerline for Route 3. The proposed HVTL alignment in Route 3 would utilize an existing transmission line ROW, and therefore would not create a new visual impact to houses within that route.

There are seventeen houses in ATF Alignment 2-3 within 500 feet of that alignment, which increases the number of houses potentially impacted by one. In both cases, construction of an HVTL would occur within an existing transmission line ROW.

There are four houses in Pengilly that are located within 500 to 1,000 feet from the proposed Route 3 HVTL alignment that would have an unobstructed view of the Proposed Project.

Distance and visual screening by vegetation or topography all influence the potential for aesthetic impacts of new and existing HVTLs.

Route 3A

A new visual impact would be created by the proposed HVTL for Route 3A. Eight houses are within 500 feet of the centerline of the proposed HVTL alignment. One additional house is located 500 to 1,000 feet from the proposed Route 3A HVTL alignment that would have an unobstructed view of the Proposed Project. Additionally, there are five houses within 500 feet of ATF Alignment 2-3A and four houses within 500 feet of ATF Alignment All-3A. Using the ATF alignments would reduce the number of potentially impacted houses by three to four houses compared to the proposed Route 3A HVTL alignment.

As described in section 6.3.3.2, Route 3, Route 3A, and ATF alternative alignments would result in new stream utility crossings. These have the potential to create visual and aesthetic impacts to the stream corridor.

Mitigation

In addition to working with property owners and public agencies to identify concerns related to the proposed HVTL and aesthetics, the Applicants described a number of other potential mitigation measures in the Route Permit Application. These included the following for Route 3, Route 3A, and ATF alignments.

- Where feasible, the location of pole structures, ROW, and other disturbed areas would be determined by considering input from property owners or land management agencies to minimize visual impacts.

- Structure types (designs) would be uniform to the extent practical. The Applicants propose to use wood H-frame structures, which are shorter than single circuit, rather than steel poles structures, which are wider and utilize two poles. The H-frame structures are between 60 and 90 feet in height. The wood poles are usually considered less intrusive in a rural forested landscape.

- The Applicants propose to minimize natural landscape disturbance as possible; construction and operation would be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings.

- As possible, waterways would be crossed in the same location as existing linear structures, such as utility lines or transportation ROW.

- Existing vegetation would be used to screen the transmission lines from areas of high visual sensitivity, where feasible.

6.3.1.4 Noise

HVTLs can produce audible sound from transmission line conductors, which can generate electromagnetic noise known as corona. This noise, corona, is typically only loud enough to be heard in close proximity to the transmission lines.

The Applicants modeled conductor noise for each possible structure design configuration: H-frame, single-pole, and single-pole 230/115 kV double circuit structures. Single circuit configurations were modeled as stand-alone structures and alongside existing 115 kV transmission lines where appropriate. The MPCA noise standards were used to ensure compliance for all design and route combinations.

According to modeling results, noise levels would be less than 20 dBA (i.e. noise level of a whisper) at the edge of the ROW during fair weather conditions.

There is one house located within the ROW of the Proposed Project, which occurs in Route 3, an existing transmission line route. ATF Alignment 2-3 shifted the proposed Route 3 HVTL alignment in order to move further away from nearby houses. Additional information on potential noise impacts from the Proposed Project are described in section 6.1.1.4.

6.3.1.5 Interference

As discussed in chapter 5, communication devices can be affected by an HVTL system through interference of the electromagnetic energy emitted at various frequencies by communcation devices or their antennae. The Proposed Project has the potential to impact electronic communication (i.e., omnidirectional and unidirectional signals) within the Study Area. Potential impacts from interference with communication and mitigation measures for those impacts are discussed in the following sections.

Impacts

Omnidirectional communication signals may be impacted by the proposed HVTL from gap discharges, corona discharges, and shadowing and reflection. The potential for gap discharges leading to interference from either of the proposed routes is minimal. Due to the high frequencies of television signals, a 230 kV line seldom causes reception problems from corona discharges. The potential for shadowing and reflection from the proposed transmission line system is minimal due to the structure types, height, and spacing. There is 19.5 feet between each structure pole, approximately 800 feet between each structure, and structure heights are similar to the trees of the surrounding landscape, and therefore the HVTL system is not anticipated to block communication signals.

Unidirectional communication signals, such as those utilized by microwave towers, may be impacted by the proposed HVTL if the line of site is interrupted. However, no direct or indirect impacts to unidirectional signals are anticipated as microwave towers are taller than the proposed structures.

A 230 kV line seldom causes reception problems from corona discharges to television signals. Structure types, height, and spacing of the HVTL reduce the potential for shadowing and reflection issues.

As discussed in section 5.3.5, no impacts to FM radio, satellite television, cellular phones, or wireless internet are anticipated due to the frequency at which such signals are transmitted and received. However, the HVTL could cause interference with AM radio signal and digital or analog television signal reception. Impacts from the Proposed Project to communication signals are expected to be minimal.

The impacts related to interference are only differential between Route 3 and Route 3A in that Route 3A has the potential to impact fewer residences than Route 3. Route 3 would also place a residence within the actual ROW which would increase the potential for impacts to that home. ATF Alignment 2-3 would remove that home from the ROW and possibly decrease the potential for impacts. ATF Alignments 2-3A and All-3A would reduce the number of residences in proximity by three and four respectively. Section 6.3.1.1 provides a detailed discussion of proximity to structures.

Mitigation

The Applicants would inspect and repair the transmission line to maintain quality reception near the HVTL. If construction of the Proposed Project causes interference, the Applicants would work with affected residences to correct the issue. Typically the addition of an outside antenna will improve reception to a satisfactory level. The Applicants would work with microwave tower operators to avoid interrupting the signal and may include shorter structures near microwave signal directions.

6.3.1.6 Public Health and Safety

The public expressed concerns regarding potential impacts from electric and magnetic fields (EMF), induction, and stray voltage. There was also concern regarding potential impacts to implantable medical devices, general human health, and public safety from the Proposed Project. Background information on these public health and safety topics was provided in chapter 5 of this Draft EIS. The following sections provide information on the potential for impacts from the proposed HVTL and possible mitigation measures for public health and safety. Computer modeling and similar projects indicate that impacts beyond the ROW (i.e., 130 feet wide) are not anticipated from the Proposed Project.

Impacts

Electric and Magnetic Fields

Electric and magnetic fields (EMF) would be created by the Proposed Project. EMF would be created by the HVTL conductors and by substation transformers. Electric field levels produced would be below the maximum 8.0 kV/m previously established by the Commission in the state of Minnesota. Magnetic fields produced would be at a level which is not likely to lead to electromagnetic interference.

Induction and Stray Voltage

The transmission lines constructed for the Proposed Project would produce induced currents. Based on modeling conducted by the Applicants, induced currents less than the NESC maximum standard (5 mA) would be produced beneath the proposed HVTL. Transmission lines do not create stray voltage but can induce stray voltage on a distribution circuit parallel or beneath the transmission lines. Stray voltage issues from the Proposed Project are not anticipated.

Implantable Medical Devices

As stated above, the Proposed Project would produce electric and magnetic fields. These fields have the potential to cause electromagnetic interference (EMI) in implanted cardiac devices. The predicted magnetic fields are significantly weaker than the recommended threshold for pacemakers and ICDs set by Medtronic (a major manufacturer). The electric fields produced would be below levels at which modern devices would generally be affected. There is still the potential for EMI with some pacemakers and ICDs. The common pacemaker malfunction due to electromagnetic interference is a reversion to asynchronous mode pacing which is not life threatening or harmful. Normal operation would resume when the person moved away from the source of interference.

Human Health

Based on available literature, there is no definitive evidence that HVTLs result in impacts to human health. Studies have been unable to produce a conclusive link between HVTLs and health concerns such as childhood leukemia.

D.L. Henshaw et al. have published several papers regarding the effects of power transmission and distribution on human health. The Henshaw Effect refers to a link between the electric fields associated with HVTLs and an increased risk of cancer. Henshaw reports an increase in lung deposition from inhaling electrically charged aerosol pollutants as opposed to neutral pollutants.

Corona discharges from HVTL conductors cause an ionization of the surrounding air. The ions which are released can attach to aerosol pollutants which can drift away and be inhaled by or deposited on a nearby person. Henshaw has also reported an increase in the concentration and deposition of radon decay products in the vicinity of power lines that can also increase cancer risks. Other studies have been unable to support Henshaw, and the Henshaw Effect on human health is of scientific debate.

Impacts from the Proposed Project on human health are not anticipated.

Public Safety

The proposed HVTL would be equipped with protective devices to safeguard the public and de-energize the line in the event of an accident or fallen structure or conductor.

The types of impacts to public health and safety are the same for both Route 3 and Route 3A. However, Route 3A has fewer homes within proximity of the ROW than Route 3 which may decrease the potential for impacts over Route 3. Route 3 would also place a residence within the actual ROW which would increase the potential for impacts. ATF Alignment 2-3 would remove that home from the ROW and possibly decrease that potential. ATF Alignments 2-3A and All-3A would reduce the number of residences in proximity by three and four respectively.

Mitigation

Significant impacts to public health and safety are not anticipated. The Applicants would comply with local, state, and NESC standards during final design and construction of the proposed HVTL. Safety procedures established by the Applicants would be followed during and after HVTL installation and the Applicants would implement proper safeguards during construction and operation of the HVTL. The Applicants would take appropriate measures to prevent the occurrence of stray voltage along the route. The Applicants would minimize potential health effects by maximizing the distance between the transmission lines and residences.

6.3.2 Land-based Economics

Land-based economics include the natural resources and amenities that are used to derive value from activities, such as agriculture; recreation and tourism; zoning and land use; and archaeological and historic resources. General information was provided regarding land-based economics in chapter 5. The following sections provide analysis on potential impacts from the Proposed Project and possible mitigation measures for each proposed alignment.

6.3.2.1 Agriculture

Agricultural land that is designated as prime farmland indicates land that is most desirable for agricultural production. The Code of Federal Regulation 7 CFR 657 defines prime farmland as, “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.” Table 6-21 summarizes the acres of prime farmland soils located within the ROW of Routes 3 and 3A. Prime farmland acreage for the ATF alignments for each Route is also presented. Agricultural resources in the Study Area are discussed in section 5.4.1 and shown on Figure 11.

Table 6-21: Farmland Soils Within ROW

Route	Farmland Soil Classification	Acres	ROW Totals
3	All Areas are Prime Farmland	76.3	102.0
	Farmland of Statewide Importance	3.7	
	Prime Farmland, if drained	22.0	
3A	All Areas are Prime Farmland	170.2	211.5
	Farmland of Statewide Importance	9.0	
	Prime Farmland, if drained	32.3	
ATF Alignment 2-3	All Areas are Prime Farmland	73.2	101.4
	Farmland of Statewide Importance	4.9	
	Prime Farmland, if drained	23.3	
ATF Alignment 2-3A	All Areas are Prime Farmland	151.1	186.6
	Farmland of Statewide Importance	7.9	
	Prime Farmland, if drained	27.6	
ATF Alignment All-3A	All Areas are Prime Farmland	148.7	184.3
	Farmland of Statewide Importance	7.9	
	Prime Farmland, if drained	27.7	

Source: NRCS

Impacts

The Proposed Project would result in permanent and temporary impacts to existing farmland. Temporary impacts such as soil compaction and crop damage within the ROW are likely to occur during construction. The timing of construction would dictate the level of temporary impacts with summer or fall construction potentially leading to crop damages, while winter construction would avoid crop damages. Temporary impacts in agricultural fields are estimated to affect approximately one acre per pole during construction activities. Permanent impacts would occur as a result of structure placement on agricultural land and would be confined to the area immediately surrounding each structure, which the Applicants have estimated to be 20 sq-ft. Table 6-22 summarizes the acres of agricultural related land cover within the ROW for the proposed routes.

Table 6-22: Agricultural Land Cover Within ROW

Route	Land Cover	Acres
3	Pasture/Hay	13.6
3A	Pasture/Hay	9.9
ATF Alignment 2-3	Pasture/Hay	12.9
ATF Alignment 2-3A	Pasture/Hay	13.6
ATF Alignment All-3A	Pasture/Hay	2.9

The majority of the mapped prime farmland areas within Routes 3 and 3A, as well as the ATF alignments for each route, are currently forested. In areas where an HVTL crosses an agricultural field or pasture, farming or grazing activities could continue around and under the HVTL. Only the areas where each H-frame wooden HVTL structure was placed would result in the loss of agricultural production. The total area of each HVTL structure is estimated to be 20 sq-ft which is very small compared to the size of typical crop fields or pastures. Due to the small area of land that would either be lost from existing agricultural production or that would permanently impact areas of prime farmland, significant impacts to existing agriculture lands or prime farmland soils are not anticipated as a result of the Proposed Project.

Livestock may be impacted temporarily during the construction phase of the Project. There is potential of livestock to have reduced access to pasture lands, and livestock may be subjected to construction noise. Impact of stray voltage on livestock due to transmission lines is not anticipated as a result of the Proposed Project.

Mitigation

The Applicants would work with affected landowners to minimize impacts to farming operations along the route. Easements would not substantially restrict farming operations as the ROW area between structures would remain available for crop production. The Applicants would utilize previously disturbed areas for construction set-up whenever possible. The Applicants would discuss the potential temporary impacts on agricultural land and request landowner permission prior to construction. Restoration would take place following construction and the Applicants would compensate landowners for crop damage or soil compaction. If required by the Department of Agriculture, the Applicants would work with the Department to develop an agricultural mitigation plan. The Applicants would try to avoid direct impacts to livestock farms and would work with individual landowners to minimize noise impacts to livestock and farm facilities during construction.

6.3.2.2 Mining and Forestry

As previously discussed in chapter 5, mining and forestry have been a historical use of the land in northeastern Minnesota and within the Study Area. The Proposed Project is directly related to the operation of the Essar Steel facility, which will actively mine taconite for steel production on-site once fully operational. The mining and forest products industries are part of the local economy and provide numerous jobs in the region. This section describes potential impacts to mining and forestry from the Proposed Project and potential mitigation measures, if required.

Mining

The Mesabi Iron Range runs northeast to southwest between the cities of Nashwauk and Taconite within the Route 3 and 3A areas. Mining resources in the Study Area are discussed in section 5.4.2 and are shown on Figure 12.

Impacts

Essar Steel currently owns mining rights within the northern 3 miles of Route 3. Approximately 21 percent of Route 3A is comprised of Essar Steel mining lands. Route 3A also crosses near historic mine land areas near the cities of Taconite and Marble. Construction of the proposed HVTL is necessary for the Essar Steel mining operation expansion to move forward.

Mitigation

The Applicants have selected route locations that would allow Essar Steel to mine ore resources within the Study Area. The Applicants would work with existing and future mine operators to align the proposed HVTL to limit impacts to current and planned mining operations. Mitigation measures would be developed as necessary.

Forestry

Forests are the predominant land cover in the Study Area, including a variety of coniferous, deciduous and mixed forest lands. Forestry resources in the Study Area are discussed in section 5.4.2 shown on Figure 12.

Impacts

Land that is currently a forestry resource would be permanently impacted by the proposed HVTL. Within the ROW, forested land would be converted to a non-forest use. Forested areas would be cleared to allow for construction and operation of the transmission lines. However, the impact to forested areas is small relative to the forestry resources in the area and the forestry economy is not likely to be affected. Table 6-23 presents detailed information regarding the forested areas within the ROW for Routes 3 and 3A, as well as the ATF alignments for each route.

Table 6-23: Forestry Impacts Within ROW

Route	Proposed Converted Acreage
Route 3	114.6
Route 3A	216.8
ATF Alignment 2-3	108.9
ATF Alignment 2-3A	214.6
ATF Alignment All-3A	204.0

Mitigation

Timber harvested during construction would be made available to landowners for firewood, saw logs, or other uses. During construction, previously disturbed areas would be utilized for construction staging areas whenever possible. Trees and vegetation would be preserved to the maximum extent practical. Temporary access road construction would be coordinated with landowners and temporary impacts would be restored following construction. Previously forested areas, impacted by the Proposed Project, would be allowed to establish low growing species of forbs, grasses, and shrubs that would not interfere with operation and maintenance of the HVTL.

6.3.2.3 Zoning and Land Use Compatibility

The construction of a new HVTL in an area that currently does not have an existing HVTL poses a greater potential for impacts to land use and possibly zoning compatibility, as compared to constructing a new HVTL within an existing utility corridor. The Proposed Project would be located in portions of Itasca County and the cities of Nashwauk and Taconite. These local government entities consider an HVTL a compatible land use with their current respective zoning ordinances.

Impacts

The proposed Route 3 HVTL alignment would be located within an existing transmission line ROW. The existing transmission line ROW crosses through several zoning districts, which include public open space, farm residential, and industrial (Figure 13). New ROW for the proposed Route 3 HVTL alignment would be created within the city of Nashwauk municipal

boundary. The city of Nashwauk has zoning authority within its municipal boundary. The City does not regulate the construction of HVTLs in the current ordinance.

The Route 3A proposed HVTL alignment and the ATF proposed alignments would cross a farm residential zoning district (Figure 13), the city of Taconite municipal boundary, and part of an industrial zoning district. Approximately half the length of the proposed Route 3A alignment would utilize existing transmission line ROW.

According to the Itasca County zoning ordinance, special structures do not require a building permit and are not subject to setback requirements. The proposed HVTL would be considered an essential service and a compatible use.

Mitigation

The Proposed Project is compatible with the Itasca County Zoning Ordinance and the city of Nashwauk Zoning Ordinance. No mitigation would be required for the construction or operation of the Proposed Project.

6.3.2.4 Transportation and Public Services

Transportation and utility infrastructure is established in the Study Area. The Proposed Project would cross or be located adjacent to a variety of existing roadways and infrastructure within the Study Area (Figure 14). The following sections discuss the potential impacts within the proposed HVTL alignment to transportation and public services, including existing utilities, public emergency services, roadways, railways, and airports.

Existing Utilities

Impacts

A Northern Natural Gas Company pipeline, which runs in a northeast-southwest direction, would be crossed three times by the proposed Route 3 HVTL alignment. The pipeline would be crossed once near the west side of Pengilly, and twice in Section 34 of T56N, R23W. This pipeline would also be crossed by the proposed Route 3A HVTL alignment. The proposed HVTL alignment for Route 3A would also run parallel to the pipeline for approximately one mile. Additionally, the proposed Route 3A HVTL alignment would run parallel to the state-approved NPUC pipeline for the proposed Mesaba Energy Project.

The existing 115 kV 63 Line and 115 kV 28 Line are both maintained by Minnesota Power. The 28 Line is eventually collocated with 63 Line near the city of Pengilly. The existing transmission line would be paralleled and then crossed by the proposed HVTL alignment for Route 3 southwest of the city of Nashwauk. The existing transmission lines would have the potential to be damaged during construction of proposed Route 3 HVTL alignment by equipment potentially hitting pole structures or line during collocation with the existing HVTL.

Construction of the proposed HVTL alignment for Route 3A would have the potential to damage the existing 115 kV 28 Line, currently maintained by Minnesota Power. The proposed Route 3A HVTL alignment would run parallel to the 28 Line and then cross it southwest of the proposed Essar Steel Mine substation. During construction, there is potential for damage to occur to the 28 Line by equipment potentially hitting pole structures or line during collocation. No long term impacts are anticipated after completion of construction.

The new H-frame wooden poles for the HVTL structures would be placed in augered holes approximately 10 to 15 feet deep. Minor grading may be required to provide level construction surfaces at each structure location. These construction activities would have the potential to impact existing underground utilities. Equipment used for augering or stringing operations is tall. Moving vehicles and cranes would have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

Moving vehicles and cranes have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

When an HVTL is located adjacent to a pipeline right-of-way, the pipeline may be subject to electrical interference from electric and magnetic induction, conductive interference and capacitive effects.

Magnetic induction is the primary effect of a high voltage AC transmission line on a buried pipeline during normal (steady state) operation. Conductive interference is a concern when a transmission line fault occurs in proximity to the pipeline, as it can cause AC currents to enter the pipeline at coating holidays (i.e., flaws in the coating) and produce a voltage gradient across the pipeline coating. Capacitive effects are typically only a concern during pipeline construction when long sections of the pipeline are above ground.

If these electrical interference effects are great enough during normal operation, then a potential shock hazard exists for anyone that touches an aboveground part of the pipeline, such as a valve or cathodic protection test station. In addition, during normal operation, if the induced AC current density at a flaw in the pipeline coating is great enough, AC pipeline corrosion may occur. Lastly, damage to the pipeline coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

Although electrical interference from the close proximity of the proposed HVTL alignment to the state-approved NPUC pipeline is a possibility, no impacts are anticipated.

Mitigation

The Applicants would continue to work with existing HVTL owners along the selected Routes during final pole structure placement to avoid causing damage to existing transmission lines. New HVTL poles would be placed in a manner so as not to disrupt existing local and regional utilities. If necessary the Applicants would combine the proposed HVTL with the existing HVTL onto one pole structure to eliminate further environmental impacts.

In the event that a Route Permit is granted for the Proposed Project, the Applicants would use the known locations of existing water, sewer, gas, electrical, telephone and cable lines during final engineering and design to avoid impacting these services. Upon completion of the HVTL design, the Applicants would be required to locate all of the above mentioned utilities in the field prior to HVTL construction to avoid disruption of services.

The Applicants would work with Northern Natural Gas Company to identify final HVTL structure locations to ensure pipeline operations would note be affected during construction. The Applicants would coordinate with Northern Natural Gas Company to determine if it is necessary to install AC mitigation to insure that the Proposed Project's high voltage AC transmission lines could be safely collocated with the gas pipeline.

The National Association of Corrosion Engineers has standards that ensure that pipeline integrity would not be degraded nor personnel safety compromised because of AC interference from a transmission line constructed and operated adjacent to a pipeline. AC interference effects can be predicted with computer modeling and if necessary, mitigation measures would be taken to minimize AC interference and reduce transmission impedance. None of the mitigation measures would require additional ROW. A detailed description of possible mitigation measures can be found in the Route Permit Application.

Public Services

Impacts

There are no public service facilities within Route 3. However, there are two public service facilities within 0.75 miles of the proposed HVTL alignment for Route 3, the Nashwauk Police Department and the local medical clinic. Proposed Route 3A would not affect public service facilities. There would be potential for delay in emergency service during HVTL construction; however HVTL construction is not anticipated to cause significant or long term impacts.

The Proposed Project would add a small number of workers to the Study Area, however it would not result in a measurable increase in the demands on public services such as fire, police or local hospitals.

Mitigation

The Applicants would coordinate with emergency service providers to ensure that there would be no interruption in servicing capabilities. Accessibility to local residences by emergency service vehicles would be provided by stopping construction progress and rearranging equipment so the emergency vehicles could access the residences in need of those services.

Generally, construction activities would be staged such that public roads would be minimally impacted by lane closures or brief periods of road closures. Once construction was completed, the proposed HVTL alignment would span state, county, and township roads, and therefore would not delay emergency vehicles or services provided.

Highways and Roads

The construction period of the proposed HVTL would last for up to several months depending on route length, terrain, weather, and other factors. Construction traffic would use the existing county and state roadway system to access the Proposed Project and deliver construction materials and personnel. Major truck access to the Proposed Project is generally served by TH 65 and TH 169. Specific additional truck routes would be dictated by the location required for material delivery or staging.

Impacts

Construction personnel would use the existing county and state roadway system to access the proposed HVTL alignment to deliver construction materials and equipment during active construction of the HVTL. Increases in construction-related traffic on county and township roadways have the potential to damage the roadway system by exceeding functional weight capacity. Equipment used for construction of the proposed HVTL alignment could also damage existing roadways by direct damage to infrastructure.

Motor vehicle traffic in the vicinity of the Proposed Project would be temporarily impacted by the increased construction traffic during the active construction phase of the proposed HVTL alignment. Light, medium, and heavy-duty construction vehicles, along with personal construction vehicles, would travel to and from the construction site.

Maximum traffic volumes are anticipated to occur during pole and line assembly. Traffic disruption associated with construction would be localized for short, temporary periods. At the completion of the HVTL alignment, equipment would be removed from the site or reduced in number. HVTL construction in Route 3 or Route 3A is not be anticipated to result in permanent traffic impacts.

Route 3 would cross four different CSAHs (crosses CSAH 70 twice), two trunk highways, one CR, and one township road. Route 3 parallels CSAH 58 for 0.58 miles. The AADT for each road network in Route 3 is listed below in Table 6-24.

Table 6-24: AADT for Route 3 HVTL Alignment Crossings

Road Network	AADT	Survey Year
CSAH 58	90	2005
TH 169	7300	2006
TH 65	2300	2006
CSAH 83	355	2005
CSAH 12	410	2005
CSAH 70 (twice)	590	2005
CR 434	145	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

Route 3A would cross one trunk highway, two CSAH, two county roads and two township roads, one of which would be crossed twice. The proposed HVTL alignment would not parallel existing roadways. The AADT for each road network in Route 3A is listed below in Table 6-25.

Table 6-25: AADT for Route 3A HVTL Alignment Crossings

Road Network	AADT	Survey Year
TH 169	6500	2006
CSAH 70	590	2005
CR 434	145	2005
CSAH 58	90	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

The proposed HVTL alignments in Routes 3 and 3A would require the installation of new or temporary access roadways adjacent to the Route in order to allow construction equipment access. Existing and new access roads would serve to connect the proposed HVTL alignments with the existing roadway system.

Long term impacts to the transportation network from the Proposed Project beyond the construction period are not anticipated.

Mitigation

Construction of the Proposed Project would be in accordance with all associated federal and state permits and laws, as well as industry construction standards. Transportation disruptions are

anticipated to be localized, temporary and intermittent for the construction periods required to erect the pole structures. Access easement agreements would be obtained prior to construction and would be maintained to allow for access to ROW during the construction and operation of the proposed HVTL. The Applicants would also coordinate with MNDOT, Itasca County, and local government units to obtain the necessary over width/overweight permits as needed for trucks and heavy equipment, and acquire the necessary utility crossing permits. The Applicants would also coordinate temporary road or lane closures due to materials delivery or construction, such as HVTL stringing over public roadways, with the appropriate entities.

Damage to public roads would be repaired in accordance with applicable laws and permits, and damage to private roads would be promptly repaired unless otherwise negotiated with the affected landowner. Traffic management and control of local roadways would be considered in the planning and implementation of HVTL construction, especially when crossing public roads. These measures minimize the potential for traffic disruptions. The Applicants may be required to secure a bond with the jurisdictional county or township in order to provide assurance that repairs would be made if roadways are damaged during construction of the proposed HVTL.

The Applicants would work closely with private landowners to locate HVTL access roads, while minimizing disruptions to land use or the existing rural roadway network. Similarly, close coordination with the local townships would be required to locate final ROW access roads. If loss or damage to property occurs, landowners would be compensated by the Applicants based on agreements made prior to HVTL construction.

Transporting heavy components for construction of the proposed HVTL would be dictated by seasonal roadway restrictions for the area. Mitigation for road impacts would include an agreement between the Applicants and the potentially affected community for damage to roadways associated with large truck and increased small vehicle traffic, over width/overweight vehicles, or general construction activities.

Traffic management and control of local roadways would be considered in the planning and implementation. If applicable, some construction activities would require re-routing of traffic for roadway crossings during active stringing of overhead conductors.

If applicable, some construction activities would require re-routing of traffic during roadway crossings during active stringing of overhead conductors to avoid traffic impacts. The Applicants would be responsible for contacting the Itasca County Sheriff's Department or local-servicing Police Department when crossing public roadways. Temporary guard structures would also be required to protect construction crews and the general public during HVTL construction. Guard structures would maintain necessary vertical clearance and traffic flow. The HVTL would be above ground and would span roads and highways after completion of construction.

Railways

Proposed Route 3 HVTL alignment would cross a BNSF Railroad line spur just west of the city of Pengilly. Route 3 would then parallel the main BNSF railroad between the city of Pengilly and the city of Nashwauk for approximately 2.37 miles and would then cross the main track west of the city of Nashwauk. The proposed Route 3A HVTL alignment between the city of Taconite and the city of Marble would cross the main track of the BNSF railroad. The proposed HVTL alignment for Route 3A would also parallel the Essar Steel Project rail line, which is currently under construction.

Impacts

In addition to the roadway system, construction materials may potentially be hauled on the existing railway network. This may cause a slight increase in rail traffic, but is not anticipated to be a significant impact. The increased rail traffic would be temporary during active construction of the proposed HVTL. No additional rail lines are needed to accommodate the potential temporary increase in rail traffic.

Access easement agreements with BNSF would be obtained prior to construction and would be maintained in order to allow for access during the construction and operation of the HVTL.

The construction of an HVTL has the potential to damage track or railroad crossings within the proposed HVTL alignment. Potential impacts to the existing track could be caused by large equipment hitting or damaging the track during construction. These potential impacts are more likely to occur when the HVTL alignment is near the track or crosses the track. The Route 3 HVTL alignment would cross one BNSF rail spur and would also cross the main BNSF rail track. The Route 3A HVTL alignment would cross the main BNSF track.

When an HVTL is located adjacent to a railway, there is potential for a railway's tracks and signals to be affected by electrical interference from capacitive, electric and magnetic, and conductive effects. If a transmission line is located in proximity and parallel to a railway for long distances, all these interference mechanisms can cause high currents and voltages to develop on the railway's tracks and communication cables. If the AC interference is above certain thresholds, it can result in personal safety hazards, damage to signal and communication equipment, and false signaling of equipment. Greater detail on the causes of electrical interference in the vicinity of railway tracks is provided in the Route Permit Application.

Mitigation

Construction of the HVTL has to be carefully coordinated and properly designed to avoid impacting rail operations. The Applicants would be required to secure a bond with BNSF Railroad to ensure proper repair of damages to existing rail infrastructure if they occur during construction of the Proposed Project. The Applicants would need to carefully coordinate design and construction of the HVTL with the BNSF Railroad to ensure daily rail operations would continue unimpeded.

AC interference effects can be predicted with computer modeling. With proper planning and mitigation management, railways and high voltage AC transmission lines can be safely collocated. The American Railway Engineering and Maintenance-of-Way Association has specifications for steady state rail-to-ground and equipment-to-ground voltage levels to insure safety of railway operating personnel and the public.

The Nashwauk Public Utilities has indicated that if the proposed transmission line (Route 3A) is collocated with the ESM Project's railroad (under construction) the railroad's design would include an analysis of AC inference levels and installation of any required AC mitigation. If mitigation is determined to be required; depending on AC interference levels, several mitigation methods may be used. These include reducing the distance between insulated joints in track sections, grounding the railroad's tracks, and burying gradient control wires or matting. It is unlikely that installing any of the aforementioned mitigation methods would require additional right-of-way. Additional detail on the mitigation measures proposed by the Applicants is provided in the Route Permit Application.

Airports

There are no airports or landing strips located in close proximity to the HVTL alignments in Routes 3 or 3A. Construction and operation of the proposed HVTL alignments for Routes 3 and 3A would not impact local airports, landing strips, or airplane safety in the Study Area. Therefore, no mitigation would be required.

6.3.2.5 Recreation

The construction of an HVTL has the potential to impact recreational resources and recreational experiences, specifically the use of snowmobile trails. This Draft EIS determined where potential impacts to recreational resources from the Proposed Project could occur based on the proposed HVTL alignment.

Impacts

The Itasca Greenway Snowmobile Trail currently runs parallel to an existing transmission line ROW. The proposed Route 3 HVTL alignment parallels sections of the Itasca Greenway Snowmobile Trail for about 2.5 miles of its alignment. The proposed HVTL alignment also crosses the Itasca Greenway Snowmobile Trail at four to six locations (Figure 15). If construction of the proposed Route 3 HVTL alignment occurs in the winter, use of the Itasca Greenway Snowmobile Trail could be temporarily impacted. Minor trail realignments may be required depending on the final HVTL alignment.

The proposed Route 3A HVTL alignment would run parallel to the Lawron Snowmobile Trail for about two miles just south of proposed Route 2. The proposed HVTL alignment for Route 3A would cross the Lawron Snowmobile Trail at three locations. If construction occurs during the winter, temporary impacts to the use of the trail may occur. Where the trail runs parallel to the proposed HVTL alignment, there is a possibility that minor trail realignments may be required depending on the final HVTL alignment. Potential impacts from the ATF alignments would be the same as those identified for Routes 3 and 3A.

Mitigation

The Applicants have proposed to work with local snowmobile clubs if realignment of existing grant-in-aid snowmobile trails is required in Routes 3 and 3A.

6.3.2.6 Archaeological and Historic Resources

The construction of an HVTL has the potential to disturb land and can alter landscapes by potentially introducing a new visual impact. These impacts can potentially affect the integrity of archaeological and historic resources within a project vicinity.

SHPO records indicate there are no sites within Route 3. In Route 3A, there are two sites that are near the former substation and close to the proposed HVTL alignment. These sites are identified as IC-IRT-010: Duluth, Missabe & Northern Railway Alborn Branch Line, and IC-IRT-018: House. Both of these sites are recommended as eligible for listing in the NRHP. Additional information on potential impacts to archaeological and historic resources from the Proposed Project is provided in section 6.1.2.6.

As previously discussed in section 5.4.6, there may be additional archaeological and historic resources in the Study Area that have not yet been identified or recorded by SHPO. Unknown resources have the potential to be impacted by the Proposed Project primarily during the construction phase. The Proposed Project is not anticipated to cause adverse impacts to archaeological and historic resources.

Mitigation

No adverse impacts to identified sites are anticipated. If currently unidentified sites are discovered during construction, the Applicants would coordinate directly with SHPO and would determine the proper measures to minimize or mitigate for impact to the sites.

The Applicants indicated in the Route Permit Application that the potential existence of the Native American burial mounds near Little Sucker Lake needs to be further investigated prior to construction. If burial mounds are discovered, measures to avoid and not disturb the burial mounds would be taken in accordance with Minnesota Statute 307.08.

The Applicants would also integrate into the construction bid documents a training, monitoring and discovery plan should previously unknown cultural resources or human remains be inadvertently encountered during construction. Additional detail on the training, monitoring and discover plan are provided in 6.1.2.6.

6.3.3 Natural Environment

HVTL projects typically traverse miles of land through undeveloped areas and along existing utility corridors. Natural resources typically influence the design, alignment, and construction of a new route based on topography and other natural features, such as lakes, forests, and wetlands.

Chapter 5 provided information on the existing conditions of the natural environment of the Study Area, including air quality; water resources; wetlands; flora and fauna; and rare and unique natural resources and critical habitat. Potential impacts within the proposed HVTL alignment related to the natural environment and possible mitigation measures are discussed in the following sections.

6.3.3.1 Air Quality

The Proposed Project has the potential to affect air quality in the area through corona effects and from leaks of the Greenhouse Gas SF_6 at the electrical substations. In addition, there may be limited short term emissions during construction of the transmission line. Additional information regarding potential impacts to air quality from the Proposed Project is provided in section 6.1.3.1.

6.3.3.2 Water Resources

There are a significant number of water features located within Itasca County and the Study Area. The lakes, rivers and streams in the Study Area as well as a description of the floodzones and groundwater resources are provided in section 5.5.2 of this Draft EIS (Figure 16). Construction of the Proposed Project would occur near, over and adjacent to a variety of surface and groundwater features. A discussion of the potential impacts to surface water, floodzones, and groundwater resources is provided as well as potential mitigation measures that would be required.

Impacts

Surface Water

There are two lakes located within Route 3 and three lakes located within Route 3A. The two lakes located within Route 3 include Lower Panasa Lake and an unnamed basin (PWI 31-0089-W). The proposed HVTL alignment in Route 3 would pass south of Lower Panasa Lake but would cross over the unnamed basin. However, Route 3 follows the ROW of the existing 62 and 63 Lines for much of its route, and as a result the proposed HVTL alignment in Route 3 would add a utility line to the crossing of the unnamed basin, but it would not be a new crossing. The ATF developed alternative alignment 3-2 within Route 3, which would shift the HVTL to the east within proposed Route 3. If this ATF alternative alignment were selected, it may be possible to pass east of the unnamed basin and not add another HVTL line to the existing utility crossing of the basin.

The three lakes located within Route 3A are Big Diamond Lake, Holman Lake, and South Twin Lake. The proposed HVTL alignment would not cross these three lakes, resulting in no lake utility crossings by the HVTL in Route 3A. The ATF developed two alternative alignments for Route 3A, however those alternative alignments are located several miles to the south of the lakes within Route 3A, and therefore would not result in lake utility crossings.

There are seven streams that pass through Route 3: Swan River, Snowball Creek, Oxhide Creek, Pickerel Creek, an unnamed tributary to the Swan River, and two small unnamed streams. The proposed HVTL alignment for Route 3 would cross six of these streams (Figure 9). One of the small unnamed streams at the northeast end of Route 3 would not be crossed by the proposed HVTL alignment. Route 3 follows the existing ROW of the 62 and 63 Lines. As a result, the proposed HVTL alignment would add a utility line to the existing stream utility crossings at Swan River, Snowball Creek, Oxhide Creek, Pickerel Creek, and the unnamed tributary to the Swan River. The only new stream utility crossing that would result from the proposed HVTL alignment in Route 3 would be crossing one of the small unnamed streams at the northeast end of the route (Figure 9). The ATF Alignment 2-3 would not travel outside of proposed Route 3 and would not affect the number of stream crossings for the HVTL alignment in Route 3.

Construction of the proposed HVTLs would result in new stream utility crossings for Route 3A.

There are eight streams that cross through Route 3A, including Swan River, four unnamed tributaries to the Swan River, and three unnamed tributaries to Sucker Brook. The proposed HVTL alignment in Route 3A would cross all eight of these streams and would result in eight new stream utility crossings. AFT alignments 2-3A and All-3A would shift the proposed HVTL alignment east of the Applicants' proposed alignment for Route 3A. This would take portions of the HVTL alignment outside Route 3A as identified by the Applicant. By shifting the alignment east, both ATF alternative alignments would not cross the southern most unnamed tributary to the Swan River. Therefore, if either of the ATF alignments were selected, there would be seven as opposed to eight stream utility crossings for the HVTL alignment in Route 3A.

Impacts to surface waters from the construction of the Proposed Project could occur as a result of vegetation clearing within the ROW, as well as site grading and structure placement at each of the transmission line pole locations. These project related activities could result in erosion that could lead to sediment runoff into adjacent lakes, rivers or streams. Impacts are most likely to occur at HVTL construction or ROW clearing locations adjacent to water bodies or at stream or lake utility crossings. There would be some hazardous materials used and stored temporarily during

the construction of the Proposed Project, such as transmission fluid or diesel fuel. If not handled and stored properly, a spill of these materials could create an impact to local surface waters.

Floodzones

There are no FEMA defined floodzones associated with the lakes, streams and rivers at the locations where these water bodies cross through Routes 3 and 3A. There are FEMA defined floodzones associated with the Swan River but not along the portions of the river that would be crossed by the proposed HVTL alignments in either Route 3 or 3A. ATF Alignment 2-3 would also cross the Swan River outside of the FEMA defined floodzones for the river. Additionally, ATF Alignments 2-3A and All-3A are located south of where the proposed HVTL alignment would cross the Swan River and therefore would not impact floodzones associated with the river. As a result, the stream utility crossings associated with the Applicants proposed HVTL alignments in Routes 3 and 3A or the ATF alignments for Routes 3 and 3A would not result in impacts to floodzones.

Groundwater

The Study Area is located within the groundwater recharge area known as the Mississippi River Headwaters (HA-278). Within this area, bedrock is typically located between five and over 500 feet below the ground surface. Groundwater aquifers in this region are typically five to 50 feet in thickness within gravel soils located from 50 to 500 feet below the land surface. The proposed wooden H-frame transmission line poles would be placed in augered holes at depths of 10 to 15 feet below the surface. Therefore the HVTL poles would not intercept groundwater aquifers in the area. Additionally due to the depth of the local groundwater aquifer it is unlikely that temporary dewatering would be required during HVTL construction. There would some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to the local groundwater aquifer.

Mitigation

The Applicants would be required to obtain a permit from the MNDNR for the lake and stream utility crossings associated with Route 3 or Route 3A. It is unlikely that the MNDNR permit would allow the placement of HVTL poles within streambeds or lake beds. However, if upon completion of final HVTL design it was determined that it would not be possible to avoid placement of HVTL poles within a stream or lake bed, the Applicants would also be required to obtain a work in public waters permit from the MNDNR. This permit would require that the Applicants provide a plan for minimizing disturbance of habitat and water quality within the stream or lake during construction.

The Applicants would be required to obtain permits from the MNDNR and MPCA for potential impacts to surface waters.

The Proposed Project would disturb more than one acre of land and as a result would be required to obtain an NPDES construction permit from the MPCA. The NPDES permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP). Within the SWPPP, the Applicants would be required to identify specific construction BMPs that would be implemented to minimize impacts to the water quality of surface waters adjacent to or within the HVTL construction ROW. Construction BMPs would include items such as silt fences, bio-roles, staked bales or silt curtains. Once construction is complete the disturbed areas would be restored to the previous vegetation condition if possible. In the case of forested lands, vegetation would be

replaced with an approved native grass seed mixture to establish suitable low height vegetative cover. Upon completion of vegetation restoration within the ROW sediment runoff would be similar to conditions prior to construction. The implementation of the construction BMPs in the SWPPP would ensure minimal impacts to water quality of adjacent water bodies.

Floodzones would not be impacted by HVTL construction within Route 3 or Route 3A. Groundwater aquifers are located below the depth of construction for the HVTL poles. The NPDES construction permit required for the Proposed Project would address the handling of stored construction materials, including items such as diesel fuel or transmission fluid. If a spill occurs, the Applicants would be required to implement the measures identified in the NPDES construction permit to minimize impacts to surface water or groundwater resources. In the event of a spill of more than five gallons, the Applicants would be required to contact the MPCA state duty officer and then would be required to conduct spill remediation activities as direct by the duty officer.

6.3.3.3 Wetlands

The Proposed Project is located in Itasca County, which has an abundance of wetlands of varying types. Chapter 5 of this Draft EIS provides information on the wetlands located within the Study Area (Figure 17). The following sections discuss potential impacts to wetlands located within the proposed HVTL alignments and possible mitigation measures for impacts to those wetlands.

Impacts

Wetlands within Route 3 and 3A were identified using NWI data in section 5.5.2 and are displayed in Figure 9. The regulatory framework in regard to wetlands is also described in section 5.5.2.

The proposed HVTL alignment encompasses a 130 foot wide ROW within each route. Table 6-26 compares and summarizes wetland areas within each proposed HVTL 130 foot ROW by total wetland area and by wetland type.

Table 6-26: Wetlands Within Route 3 and 3A Proposed HVTL ROW

Route	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Total Wetland Area (acres)
Route 3	0.0	11.0	6.2	0.2	1.1	19.7	3.1	15.5	**56.8**
ATF Alignment 2-3	0.0	10.5	7.4	0.2	0.4	21.6	1.8	15.3	**57.3**
Route 3A	0.0	7.1	0.0	0.0	0.0	19.4	21.3	23.3	**71.1**
ATF Alignment 3A	0.0	4.3	0.0	0.0	0.0	16.2	21.6	19.4	**61.5**
ATF Alignment 2-3A	0.0	4.3	0.0	0.0	0.0	20.7	27.0	32.9	**84.8**

Three types of wetland impacts would potentially occur from the Proposed Project: permanent impacts, temporary impacts, and conversion of wetland type. Impacts would be quantified by the Applicants prior to construction.

Permanent impacts would occur from dredging or filling during installation of structures associated with the HVTL. The Route Permit Application indicates that the construction of an H-frame wooden HVTL structure impacts 20 sq-ft of land. Permanent impacts to wetland encompassing approximately 20 sq-ft per structure would occur from filling activities that would be necessary wherever a structure would be installed within a wetland. Structures would be installed within wetlands that could not be avoided by the H-frame structure spacing, which would vary from 600 to 1,000 feet.

Temporary impacts to wetlands within the proposed HVTL alignment would occur from construction activities within the wetland basins including temporary vegetation removal or soil compaction. Temporary impacts would be caused by crossing the wetland during construction of the HVTL.

Impacts classified as conversion of wetland type would occur wherever vegetation is permanently cleared within the HVTL ROW. Woody forested vegetation would likely be the only vegetation type that would be permanently cleared. As a result, the Proposed Project would potentially convert wetland types with woody vegetation, shrub swamp (Type 6) and wooded swamp (Type 7), into wetland types such as wet meadow (Type 2) or shallow marsh (Type 3) that would have similar hydrologic regimes but would be dominated by non-woody species.

Shrub swamp (Type 6) and wooded swamp (Type 7) are wetland types containing woody vegetation found in Route 3 and Route 3A that would be potentially converted to a different wetland type. As shown in Table 6-26, the proposed HVTL ROW in Route 3 and ATF 2-3 contains a smaller area of combined shrub swamp and wooded swamp than Route 3A and ATF Alignment All-3A and ATF Alignment 2-3A. The combined area of shrub swamp and wooded swamp in Route 3 and ATF Alignment 2-3 ranges from 22.8 acres to 23.4 acres while the combined area of shrub swamp and wooded swamp in Route 3A and ATF Alignment All-3A and ATF Alignment 2-3A ranges from 37.8 acres to 41.2 acres.

Indirect wetland impacts would potentially occur if impacts outside of the HVTL ROW are caused by Project activities. They would result from a direct physical alteration that occurs within the HVTL ROW (filling, excavation, vegetation clearing) that may indirectly affect characteristics of wetlands, such as vegetation type, hydrology, or wetland functions, outside of the HVTL ROW.

Mitigation

For unavoidable wetland impacts, the permitting process determines the wetland mitigation ratio and type of wetlands created.

Regulatory agencies with jurisdiction over wetlands within the Study Area are identified in section 5.2.2. Regulatory processes require documentation of existing wetland boundaries, quantification of proposed wetland impacts, and documentation of project sequencing. Project sequencing includes wetland impact avoidance and minimization efforts, as well as proposed mitigation for unavoidable impacts.

Unavoidable impacts to wetland from the Proposed Project must be mitigated as required by state and federal regulatory requirements. The mitigation ratio (i.e., the amount of wetland that must be created to replace impacted wetlands) is determined in the permitting process. The permitting process also ensures that equivalent wetland types are created.

The mitigation ratio is also influenced by a number of other considerations, including:

- the type of impact (i.e., permanent, temporary or conversion of type);

- whether mitigation is completed concurrently or prior (in-advance) to wetland impacts;
- location of the mitigation wetlands relative to the impact wetlands (in-place);
- the type of mitigation wetlands relative to the impact wetlands (in-kind);
- the type of mitigation proposed, such as creation, restoration, or preservation; and
- winter time construction may be considered in an effort to minimize impact to vegetation communities.

The overall goal of the regulations is to replace wetland impacts with wetlands that are of the same type, provide similar functions, and are of comparable or better quality compared to the impacted wetlands.

Permanent wetland impacts within Route 3 and Route 3A would be quantified by the Applicants, and a wetland replacement plan would need to be submitted to regulatory agencies and approved prior to the start of construction. The Applicants would avoid permanent wetland impacts within Route 3 and 3A by spanning wetlands wherever possible. Where wetlands are too large to span and construction of structures are necessary in the wetland, the Applicants would minimize wetland impacts to the greatest extent possible. The Applicants have also committed to additional minimization efforts that are identified in the Route Permit Application.

Temporary wetland impacts would occur within Route 3 and Route 3A where wetlands would need to be crossed during HVTL construction. Temporary impacts are regulated differently by state and federal agencies. WCA allows for temporary impacts for up to six months without requiring mitigation as long as areas are restored to original conditions at the completion of construction. The USACE has required permanent wetland replacement for temporary impacts to wetlands (six months or less) in the past for other projects. The replacement ratios used by the USACE for temporary wetland impacts typically range from 0.1:1 to 0.5:1. Potential temporary wetland impacts would need to be quantified by the Applicants prior to the start of construction. Areas of temporary wetland impact would be restored as required at the completion of construction activities.

The USACE may regulate the temporary or permanent conversion of wetland type by requiring mitigation at a ratio generally ranging from 0.1:1 to 0.5:1, depending on the type of wetland that is impacted. Generally, the USACE would be most concerned with the conversion of wetlands of Type 6 and Type 7 basins to wetland types containing non-woody vegetation. The USACE may require a case-by-case evaluation to determine the required compensation for wetland impacts.

WCA does not specifically regulate conversion of wetland type through the clearing of vegetation if the activity does not involve draining, filling, or excavating. Itasca County SWCD, as the responsible WCA agent, has the authority to interpret whether activities associated with clearing constitute draining, filling, or excavating result in impacts, and therefore would require mitigation.

Indirect impacts to wetlands would be avoided by the Applicants by using sound construction practices. According to the Route Permit Application, these practices would be detailed in the NPDES permit and SWPP that would be completed prior to the start of construction.

6.3.3.4 Flora and Fauna

The Proposed Project would result in the alteration of the vegetation and wildlife habitat conditions in the Study Area. Alterations would occur through the establishment and maintenance of ROW and the construction of new HVTLs. A description of the potential impacts to

vegetation, wildlife habitat, wildlife populations and fisheries resources, along with required mitigation, is provided in this Draft EIS.

Impacts

Vegetation

The Applicants have proposed to establish 130 foot wide ROW for construction and operation of the proposed HVTL. Land cover within the Study Area is presented in Figure 18. An analysis of the land cover and vegetation communities within the new 130 foot ROW was conducted for the proposed HVTL alignments in Route 3 and Route 3A. An additional analysis of the vegetation was conducted for Route 3 including ATF Alignment 2-3, and for Route 3A including ATF Alignments 2-3A and All-3A. The vegetation communities within the 130 foot ROW for each of the five alignment alternatives are presented in Table 6-27.

Table 6-27: 2008 NASS Land Cover Analysis for Each HVTL Alignment

Land Cover Class	Route 3 Alignment	ATF Alignment 2-3	Route 3A Alignment	ATF Alignment 2-3A	ATF Alignment All-3A
Deciduous Forest	98.6	92.2	193.1	192.7	181.5
Developed	18.3	18.1	7.5	5.8	6.3
Evergreen Forest	16.0	16.7	23.7	22.0	22.5
Grassland	7.8	8.6	5.9	5.9	5.9
Herbaceous Wetlands(1)	32.3	35.9	9.8	7.9	7.1
Open Water	2.2	2.2	0.0	0.0	0.0
Pasture/Hay/Crop	13.6	12.9	9.9	3.4	2.9
Shrubland	22.6	24.5	25.7	24.1	24.1
Woody Wetlands(1)	15.7	15.8	15.5	18.8	25.2
Total(2)	227.0	227.0	291.2	280.7	275.5

(1) NASS wetland categories do not match NWI wetland classifications used for detailed analysis of wetland impacts in section 6.3.3.3.

(2) ATF Alignments 2-3, 2-3A and All-3A add length to the overall HVTL which result in different land cover totals within the 130 ft ROW.

The establishment of new ROW for the construction of the proposed HVTL would result in clearing of trees within forested lands, including woody wetlands. After construction of the HVTL, a new low lying native ground cover would be established within the HVTL ROW. This would result in the loss of forested vegetation. For the other land cover types, such as grasslands, shrublands and herbaceous wetlands, the establishment of new ROW and construction of the proposed HVTL would have less of an impact on the vegetation community. Vegetation within grasslands and herbaceous wetlands would be reestablished with vegetation communities similar to the existing vegetation. For shrublands, some taller shrubs may be permanently removed, but in general this vegetation community would not be significantly altered by the establishment of the new ROW and construction of the proposed HVTL.

Another potential impact to vegetation communities during ROW clearing and construction would be the introduction or spread of invasive plant species or noxious weeds. When established vegetation is cleared for a construction project, invasive or noxious weeds can become established because they are typically early colonizing species that grow quickly on disturbed

areas. Under worse case situations, once established invasive plant species alter habitats and reduce biodiversity (USDA, 2008). Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds.

Wildlife

Wildlife habitat would be altered as a result of the Proposed Project. The most significant alterations would occur in the form of ROW clearing within forested lands. Forested areas would be cleared of trees that would interfere with the operation and maintenance of the HVTL. The conifer and deciduous forest communities would be replaced with a low lying vegetative cover, consisting mainly of grasslands. The acres of forested lands within the 130 foot ROW of the proposed HVTL alignment in Route 3, Route 3A and the routes including the ATF alignments are presented in Table 6-27. However, this land would not be completely lost as wildlife habitat as would be the case if the land was converted to urban or industrial uses. Instead it would simply be altered to a different vegetation community. The establishment of a new grassland community in the HVTL ROW would provide additional habitat for some wildlife species.

Clearing the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area.

Clearing the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area. Large equipment would create noise causing wildlife to avoid the area temporarily. However, the 130 foot ROW is relatively narrow compared to the large habitat tracks that are within the Study Area and adjacent to the HVTL alignments. The majority of wildlife within the Study Area and along the Iron Range has become accustomed to human disturbance from logging, mining or other human developments. As a result the wildlife living within the overall Study Area and along the proposed HVTL alignments would likely disperse to available adjacent habitat. In general the amount of habitats that would be impacted by the construction of the Proposed Project is small compared to the amount of available habitat in the Study Area.

The use of large construction equipment to clear the ROW and construct the HVTL may result in some local mortality to wildlife that is not able to quickly disperse to available adjacent habitat. Small or slow moving birds, mammals, amphibians and reptiles may not be able to avoid the large, fast moving, mechanized equipment. This has the potential to disturb or destroy nests or burrows with juvenile wildlife that is incapable of dispersing and may also result in direct mortality to some species. However, due to the relatively narrow width of the 130 ROW compared to the large habitat tracts in the Study Area and Itasca County, wildlife mortality would be to local individuals is not anticipated to result in population level impacts. In general, the impacts to wildlife habitat and wildlife populations from the Proposed Project are expected to be small.

Fisheries

The construction of the proposed HVTL would result in new water body crossings. The lakes and streams that would be crossed by the proposed alignments for Route 3, Route 3A and the ATF alignments are described in section 6.2.3.2. The clearing of the HVTL 130 foot ROW and grading to construct HVTL structures has the potential to result in sediment erosion or water quality impacts to adjacent lakes and streams.

The spacing of the H-frame wooden transmission line structures proposed by the Applicants would be 600 to 1000 feet. This would allow the Applicants to span most lakes, rivers and

streams crossed by the proposed HVTL alignments, limiting impacts to aquatic habitat or water quality. Transmission pole structures placed within stream or lake beds, or immediately adjacent to lakes or streams would have the greatest potential of resulting in sedimentation, water quality impacts or alteration of aquatic habitat. The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings in Minnesota. These required permits would limit or eliminate the placement of HVTL structures within lakes or streams. After completion of ROW clearing and HVTL construction, low lying vegetative cover would be established within the ROW, which would return the land to a condition similar to pre-construction. The establishment of new vegetation within the ROW would minimize or eliminate the potential for long term water quality or sediment impacts from the Proposed Project. Overall, the impacts to water quality and aquatic habitat from the Proposed Project are expected to be small.

Mitigation

H-frame structures would be 600 to 1000 feet apart, which would allow for spanning of most lakes, rivers and streams crossed by the HVTL.

The construction of the Proposed Project, including the establishment of new ROW and construction of the HVTL, would result in impacts to wildlife habitat and may result in impacts to local wildlife populations, water quality or aquatic habitat. During public scoping for this Draft EIS, residents identified concerns over impacts to mature forest stands. In the event the a Route Permit is granted for the Proposed Project, the Applicants would work directly with land owners during the easement acquisition process to identify habitat or forest concerns and make appropriate adjustments to the HVTL alignment to minimize the loss of mature forests. Impacts to wetland habitats would require a permit from Itasca County and/or the USACE prior to construction, which would require the development of an acceptable mitigation strategy to offset wetland habitat impacts from the Proposed Project. Additionally, the Applicants would be required to conduct field surveys to delineate wetlands or identify sensitive biological resources and/or habitats for the selected routes. The results of the field surveys would be potentially used to alter the HVTL alignment in order to minimize the overall impacts to vegetation, wildlife habitats or wetlands.

The ROW clearing for the Proposed Project may result in the spread or introduction of noxious weeds or invasive plant species. Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds. The Applicants have stated in the Route Permit Application that prior to construction, a designated inspector would conduct a field review for noxious weeds in areas designated for ROW, construction or staging activities. The Applicants would attempt to control the spread of noxious weeds during construction. Additionally, the Applicants would comply with all noxious weed laws in Minnesota and would control noxious weeds that are found in the ROW during vegetation maintenance activities.

The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings. These permits would limit or eliminate the placement of HVTL structures within streams or lakes and would identify measures that would be required to reduce impacts to water bodies during the construction of utility crossings. Prior to construction, the Applicants would be required to obtain an NPDES construction permit and develop a SWPPP for the Proposed Project. The NPDES permit and SWPPP would identify construction practices and BMPs that would be followed to limit habitat disturbance and minimize or eliminate impacts to water quality and aquatic habitat.

6.3.3.5 Rare and Unique Resources and Critical Habitat

The Proposed Project would result in the disturbance of vegetation communities within the Study Area, including forests, grasslands and wetlands. Some of these communities would be altered,

which could result in an impact to habitat required by threatened, endangered or rare plants or animals. The known existing threatened and endangered plants and animals in the Study Area are discussed in section 5.5.5 of this Draft EIS.

Impacts

The construction of the proposed HVTL for Routes 3 and 3A would result in the creation of new utility ROW. Establishment of new ROW and construction of the proposed HVTL would result in crossing water bodies and impacts to wetland and forest communities. There are no records or state of federally listed threatened, endangered or special concern animal species within Route 3. However, there is one known record of a state listed endangered plant species, the tuberclad rein orchid, within Route 3 (Figure 19). The tuberclad rein orchid is a vascular plant that prefers wet prairies and meadows, swales in mesic prairies, or the sandy or peaty habitats along the edges of marshes, swamps, or lakeshores (MNDNR, 2010). There is one known location of this species within a portion of Route 3 where new ROW would be established. The proposed Route 3 HVTL alignment would not impact the current location of the tuberclad rein orchid. However, there may be additional individuals or populations of this species in the Study Area. Vegetation clearing, establishment of new ROW, and construction of new HVTL structures for the proposed alignment in Route 3 have the potential to impact the tuberclad rein orchid. Potential impacts to the tuberclad rein orchid from the ATF alignment for Route 3 would be that same as those described for the proposed Route 3 HVTL alignment.

There are no records of state or federally listed threatened, endangered, or special concern plant or animals species within Route 3A. Additionally, there are no known records of threatened, endangered, or special concern plant or animals species within the ATF alignments for Route 3A. Establishment of ROW and construction of the proposed HVTL in Route 3A would not impact threatened, endangered, or special concern plant or animal species.

Mitigation

The tuberclad rein orchid is an plant species listed as endangered by the State of Minnesota and is known to exist in at least one location within Route 3, where proposed, new ROW would be established. Upon selection of a route and granting of a Route Permit for the Proposed Project, the Applicants would be required to complete a wetland survey and a biological survey for the final HVTL alignment. In the areas where the tuberclad rein orchid is known to exist or in habitats where the species is likely to exist, field surveys for the species would be required. The Applicants would work directly with the MNDNR to avoid impacts to the tuberclad rein orchid during final engineering and design of the HVTL alignment for Route 3. The Applicants may be required to shift the alignment to avoid impacts to the tuberclad rein orchid. In the event that impacts to the tuberclad rein orchid could not be avoided, the Applicants would be required to obtain a takings permit from the MNDNR for impacts to the species. The takings permit process would require detailed field surveys to document the extent of species populations, efforts to minimize impacts, documentation of impacts to the species, and development of an acceptable mitigation plan to offset impacts to the tuberclad rein orchid from the construction of the HVTL.

There would not be impacts to threatened or endangered plant species from the construction and operation of the proposed HVTL in Route 3A, and as a result, no mitigation has been proposed. Additionally, there would not be impacts to threatened or endangered animal species from the construction and operation of the proposed HVTL within Route 3 or Route 3A. As a result, no mitigation for threatened or endangered animal species is proposed.

Table 6-28: Routes 3 and 3A and ATF Group Alignment Summary of Potential Effects

Topic	Route 3 (Preferred)	Route 3A (Alternate)	ATF Group Alignment 2-3	ATF Alignment 2-3A	ATF Alignment All-3A	Summary of Potential Impacts
Effects on Human Settlement						
Proximity to Structures/Displacement	16 homes within 500 ft. of the proposed HVTL.	Eight homes within 500 ft. of the proposed HVTL.	17 homes within 500 ft. of the proposed HVTL.	Five homes within 500 ft. of the proposed HVTL.	Four homes within 500 ft. of the proposed HVTL.	One home is located within the ROW for Route 3. This home may be avoided by use of ATF Alignment 2-3.
Property Values	Impacts to property values can not be determined with certainty, but are tied to a number of factors, including condition of the property, housing market, proximity to the HVTL, aesthetics, and buyer's opinion.					
Aesthetics	The Proposed Project would introduce a new visual impact for those homes closest to the proposed alignment that do not have vegetative or topographical barriers as visual screening. Visual impacts may also be created at water body or trail crossings.					
Noise	The Proposed Project would not exceed MPCA noise standards. Noise is anticipated to be minimal to inaudible beyond the proposed HVTL alignment ROW. There is one house located within the ROW of the Route 3 alignment. No houses are located in the ROW in Route 3A or the ATF alignments.					
Interference	Impacts to omnidirectional and unidirectional signals are expected to be minimal from the Proposed Project. Some disruption of AM radio or analog television signals may occur but would only likely occur directly below the HVTL.					
Public Health and Safety	Impacts to public health and safety from the Proposed Project are not anticipated. The Applicants would comply with all local, state and NESC safety standards during design, construction, operation and maintenance of the proposed HVTLs.					
Effects on Land-based Economics						
Agriculture	13.6 acres of agricultural lands within ROW.	9.9 acres of agricultural lands within ROW.	12.9 acres of agricultural lands within ROW.	3.4 acres of agricultural lands within ROW.	2.9 acres of agricultural lands within ROW.	Farming and grazing activities could continue around and under HVTL. A very small amount of agricultural land would be lost to production.
Mining and Forestry	90.3 acres of forested lands within ROW.	148.8 acres of forested lands within ROW.	87.9 acres of forested lands within ROW.	147.4 acres of forested lands within ROW.	149.4 acres of forested lands within ROW.	Forested lands would be lost from timber production due to ROW clearing. Impacts would be small compared to regional forest resources.
Zoning and Land Use Compatibility	The proposed HVTLs are a compatible use within Itasca County and the city of Nashwauk. Zoning or land use variances or special permits would not be required.					
Transportation and Public Services	The Proposed Project would not impact local public services such as police, fire or medical. Some temporary road closures during construction may require coordination with local emergency services. The Applicants would obtain local and MNDOT permits for all road utility crossings. Traffic patterns may experience temporary disruption during construction but would not be permanently altered. Railroad and airport use would not be disrupted.					

Topic	Route 3 (Preferred)	Route 3A (Alternate)	ATF Group Alignment 2-3	ATF Alignment 2-3A	ATF Alignment All-3A	Summary of Potential Impacts
Recreation	Four to six new trail crossings.	Three new trail crossings.	Four to six new trail crossings.	Three new trail crossings.	Three new trail crossings.	Minor trail realignments may occur. Temporary impacts to trail use could occur with winter construction.
Archaeological and Historic Resources	There are no historic or archeological sites near Route 3 or the ATF alignments. In Route 3A, there are two sites that are near the former substation and close to the proposed HVTL alignment. No adverse impacts to identified sites are anticipated. The Applicants will investigate the potential presence of native burial mounds near Little Sucker Lake. The Applicants will coordinate with SHPO in the event that archaeological resources are discovered during HVTL construction.					
Effects on the Natural Environment						
Air Quality	Temporary fugitive dust impacts would occur during construction but are expected to be minor. Construction and operation of the HVTL would not be a significant source of air emissions.					
Water Resources	One lake utility crossing and six stream utility crossings would result from HVTL alignment.	No lake utility crossings and eight stream utility crossings would result from HVTL alignment.	No lake utility crossings and six stream utility crossings would result from HVTL alignment.	No lake utility crossings and seven stream utility crossings would result from HVTL alignment.	No lake utility crossings and seven stream utility crossings would result from HVTL alignment.	MNDNR permits would be required for public water utility crossings. The Proposed Project would not impact floodzones or groundwater resources. BMPs would be implemented during construction to minimize water quality impacts.
Wetlands	56.8 acres of wetlands and 22.8 acres of forested wetlands within ROW.	71.1 acres of wetlands and 40.7 acres of forested wetlands within ROW.	57.3 acres of wetlands and 23.5 acres of forested wetlands within ROW.	69.1 acres of wetlands and 41.2 acres of forested wetlands within ROW.	61.5 acres of wetlands and 37.8acres of forested wetlands within ROW.	Wetland impacts for the Proposed Project would require a permit from Itasca County SWCD and/or the USACE. A mitigation plan would be required to offset impacts to wetlands basins or vegetation.
Flora and Fauna	114.6 acres of forested habitat would be impacted.	216.8 acres of forested habitat would be impacted.	108.9 acres of forested habitat would be impacted.	214.7 acres of forested habitat would be impacted.	204.0 acres of forested habitat would be impacted.	Forested habitat would be lost as ROW is cleared. Impacts, including mortality may occur to local wildlife but would not result in population level impacts

Topic	Route 3 (Preferred)	Route 3A (Alternate)	ATF Group Alignment 2-3	ATF Alignment 2-3A	ATF Alignment All-3A	Summary of Potential Impacts
Rare and Unique Resources/Critical Habitat	One known occurrence of an endangered plant (tuberclad rein orchid) within route. No known occurrences of, threatened or endangered animals.	No known occurrences of threatened or endangered plant or animal species within route.	Inclusion of alignment would not alter the need for the Route 3 HVTL alignment to avoid impacts to known endangered plant	No known occurrences of threatened or endangered plant or animal species within route.	No known occurrences of threatened or endangered plant or animal species within route.	The Applicants would be required to conduct surveys to determine extent of endangered plant populations within or adjacent to final HVTL alignment. If impacts to endangered plants could not be avoid the Applicant would be required to obtain a takings permit from the MNDNR.

6.4 ESSAR STEEL MINE SUBSTATION TO ESSAR STEEL PLANT SUBSTATION

The purpose of Routes 4 and 4A is to connect the two proposed substations on Essar Steel property, the Mine substation and the Plant substation. This would provide an additional route for power in the event that the main HVTL to either substation was damaged or out of service. Route 4 is located entirely on Essar Steel Minnesota property. The majority of Route 4A is on Essar Steel Minnesota property, however a portion of the proposed route would cross private property between Big Sucker and Little Sucker Lakes (Figure 10). The routes defined by the Applicants are wide enough to allow for shifting of the preliminary alignment within the routes to avoid impacts to residences or sensitive resources, with the exception of near Big and Little Sucker Lakes where the width of the route is reduced to avoid the lakes.

6.4.1 Human Settlement

Background information on human settlement, which described existing conditions related to development patterns and the community, was provided in chapter 5. This section of the Draft EIS provides information on the potential impacts to human settlement from construction and operation of the Proposed Project, including proximity to structures and potential displacement; property values; aesthetics; noise; interference to radio, television, internet or cellular phones; and public health and human safety related to electric and magnetic fields, implantable medical devices, and stray voltage. Mitigation measures for each of the topic areas are also provided.

6.4.1.1 Proximity to Structures and Displacement

Displacement occurs when a residence is located at a distance that would interfere with the safe operation of a transmission line. HVTL projects have the potential to result in displacement depending on project area conditions and densities of commercial or residential properties within an HVTL route. Utilities typically do not allow residences or businesses within the final ROW easement.

Displacement results during ROW acquisitions where property currently occupied by a residence or business is required for the HVTL ROW. Typically the Applicants would request an easement to use a narrow strip of land within a property. However, ROW acquisition is regulated by Minnesota Statutes Section 216E.12 subd. 4. This statute gives a property owner the option to require the Applicants to purchase, at fair market value, an entire property that is crossed by an HVTL. Eligibility to exercise this right depends on property classification under Minnesota Statute Section 273.13 and capacity ($\geq$ 200 kV) of the HVTL.

Impacts

The Applicants provided a dataset identifying residences in the Study Area. Residences were identified through field observation/confirmation, analysis of high resolution aerial photography, and discussions with the public by the Applicants. The residences within the proposed 130 foot ROW for Routes 4 and 4A were identified using the dataset provided by the Applicants. The number of homes within 500 feet of the proposed route centerlines was also examined. Table 6-29 summarizes the results of this analysis.

Table 6-29: Number of Residences Proximate to Proposed Alignment

Route	Within 130’ ROW	Within 500’ of ROW
4	0	0
4A	0	5

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid the need for displacement. The construction of Route 4 or Route 4A would not cause displacement of residences or businesses. The Applicants' final ROW alignment and structure locations would maximize the distance of the HVTL from homes and commercial buildings.

6.4.1.2 Property Values

During scoping for this Draft EIS, concerns were raised regarding whether the Proposed Project would have a negative impact on property values. As previously discussed in chapter 5 of this Draft EIS, property values are dependant on a number of factors, so it can be difficult to determine the affect one factor may have on a given property. There have been a number of studies completed that examined whether HVTLs have an impact on property values. A brief summary of selected studies is provided in section 6.1.1.2.

Impacts

Route 4 would be constructed within a new HVTL route. There are no houses located within this route. There are no houses within 500 feet of the proposed HVTL alignment. Route 4A would be constructed within a new HVTL route. There are six houses located within this route. Five houses are within 500 feet of the proposed HVTL ROW. Houses within 500 feet of the proposed HVTL alignment have the greatest potential to experience impacts on property values.

Route 4 would be constructed completely on Essar Steel Minnesota property and would not directly impact property values. Route 4A would be constructed partially on Essar Steel Minnesota property and partially on private property. Easements have been or would be obtained by the Applicants for pole placement and crossing of private property. Route 4A has the greatest potential to impact property values of houses located between Big Sucker and Little Sucker Lakes. Five houses in that area are within 500 feet of the proposed HVTL alignment for Route 4A.

Mitigation

The Applicants identified residences prior to proposing route alignments and adjusted the proposed centerlines to avoid residences as much as possible. The Applicants' final ROW alignment and structure locations would strive to maximize the distance of the HVTL from homes and commercial buildings. Route 4 would be located completely on Essar Steel Minnesota property and would not be near houses.

6.4.1.3 Aesthetics

The measure of an aesthetic impact is dependent on the perception or response of an individual viewer. In forested areas, new HVTL alignments would require land clearing for a ROW of up to 130 wide, which would create a linear landscape feature. In other cases, the proposed HVTL alignment would follow existing road ROW and existing transmission line ROW. In areas where new HVTL ROW would be created, impacts to aesthetics have the potential to be greater, especially to areas such as parks, stream crossings or residences, for example. Residences closest

to a new HVTL would likely experience the greatest potential for aesthetic impacts compared to residences further away or located near an existing HVTL. Additional discussion on the general potential for aesthetic and visual impacts is provided in section 6.1.1.3.

Impacts

There are no homes located within 1,000 feet of the Proposed Project. Therefore, there would be no aesthetic impacts from Route 4. A new visual impact would be created by the proposed HVTL for Route 4A. Five houses are within 500 feet of the centerline of the proposed HVTL alignment. There are no houses located 500 to 1,000 feet of the proposed Route 4A HVTL alignment that would have an unobstructed view of the Proposed Project.

As described in section 6.4.3.2, Route 4 and Route 4A would result in new stream utility crossings. These have the potential to create visual and aesthetic impacts to the stream corridor.

Mitigation

In addition to working with property owners and public agencies to identify concerns related to the proposed HVTL and aesthetics, the Applicants described a number of other potential mitigation measures in the Route Permit Application. These included the following for Route 4 and Route 4A.

- Where feasible, the location of pole structures, ROW, and other disturbed areas would be determined by considering input from property owners or land management agencies to minimize visual impacts.
- Structure types (designs) would be uniform to the extent practical. The Applicants propose to use wood H-frame structures, which are shorter than single circuit, rather than steel poles structures, which are wider and utilize two poles. The H-frame structures are between 60 and 90 feet in height. The wood poles are usually considered less intrusive in a rural forested landscape.
- The Applicants propose to minimize natural landscape disturbance as possible; construction and operation would be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings.
- As possible, waterways would be crossed in the same location as existing linear structures, such as utility lines or transportation ROW.
- Existing vegetation would be used to screen the transmission lines from areas of high visual sensitivity, where feasible.

6.4.1.4 Noise

HVTLs can produce audible sound from transmission line conductors, which can generate electromagnetic noise known as corona. This noise, corona, is typically only loud enough to be heard in close proximity to the transmission lines.

According to modeling results, noise levels would be less than 20 dBA (i.e. noise level of a whisper) at the edge of the ROW during fair weather conditions.

The Applicants modeled conductor noise for each possible structure design configuration: H-frame, single-pole, and single-pole 230/115 kV double circuit structures. Single circuit configurations were modeled as stand-alone structures and alongside existing 115 kV transmission lines where appropriate. The MPCA noise standards were used to ensure compliance for all design and route combinations.

There are no houses located within the ROW of the proposed HVTL alignment for Routes 4 and 4A. Therefore, no impacts from noise are anticipated. Additional information on potential noise impacts from the Proposed Project are described in section 6.1.1.4.

6.4.1.5 Interference

As discussed in chapter 5, communication devices can be affected by an HVTL system through interference of the electromagnetic energy emitted at various frequencies by communication devices or their antennae. The Proposed Project has the potential to impact electronic communication (i.e., omnidirectional and unidirectional signals) within the Study Area. Potential impacts from interference with communication and mitigation measures for those impacts are discussed in the following sections.

Impacts

Omnidirectional communication signals may be impacted by the proposed HVTL from gap discharges, corona discharges, and shadowing and reflection. The potential for gap discharges leading to interference from either proposed Route 4 or Route 4A is minimal. Due to the high frequencies of television signals, a 230 kV line seldom causes reception problems from corona discharges. The potential for shadowing and reflection from the proposed transmission line system is minimal due to the structure types, height, and spacing. There is 19.5 feet between each structure pole, approximately 800 feet between each structure, and structure heights are similar to the trees of the surrounding landscape, and therefore the HVTL system is not anticipated to block communication signals.

> A 230 kV line seldom causes reception problems from corona discharges to television signals. Structure types, height, and spacing of the HVTL reduce the potential for shadowing and reflection issues.

Unidirectional communication signals, such as those utilized by microwave towers, may be impacted by the proposed HVTL if the line of site is interrupted. However, no direct or indirect impacts to unidirectional signals are anticipated as microwave towers are taller than the proposed structures.

As discussed in Section 5.3.5, no impacts to FM radio, satellite television, cellular phones, or wireless internet are anticipated due to the frequency at which such signals are transmitted and received. However, the HVTL could cause interference with AM radio signal and digital or analog television signal reception.

The impacts related to interference are only differential between Route 4 and Route 4A in that Route 4 does not have any residences within 500 feet of the proposed ROW, and Route 4A has the potential to impact five. Section 6.4.1.1 provides a detailed discussion of proximity to structures.

Mitigation

The Applicants would inspect and repair the transmission line to maintain quality reception near the HVTL. If construction of the Proposed Project causes interference, the Applicants would work with affected residences to correct the issue. Typically the addition of an outside antenna would improve reception to a satisfactory level. The Applicants would work with microwave tower operators to avoid interrupting the signal and may include shorter structures near microwave signal directions.

6.4.1.6 Public Health and Safety

The public expressed concerns regarding potential impacts from electric and magnetic fields (EMF), induction, and stray voltage. There was also concern regarding potential impacts to implantable medical devices, general human health, and public safety from the Proposed Project. Background information on these public health and safety topics was provided in chapter 5 of this Draft EIS. The following sections provide information on the potential for impacts from the proposed HVTL and possible mitigation measures for public health and safety. Computer modeling and similar projects indicate that impacts beyond the ROW (i.e., 130 feet wide) are not anticipated from the Proposed Project.

Impacts

Electric and Magnetic Fields

Electric and magnetic fields (EMF) would be created by the Proposed Project. EMF would be created by the HVTL conductors and by substation transformers. Electric field levels produced would be below the maximum 8.0 kV/m previously established by the Commission in the state of Minnesota. Magnetic fields produced would be at a level which is not likely to lead to electromagnetic interference.

Induction and Stray Voltage

The transmission lines constructed for the Proposed Project would produce induced currents. Based on modeling conducted by the Applicants, induced currents less than the NESC maximum standard (5 mA) would be produced beneath the proposed HVTL. Transmission lines do not create stray voltage but can induce stray voltage on a distribution circuit parallel or beneath the transmission lines. Stray voltage issues from the Proposed Project are not anticipated.

Implantable Medical Devices

As stated above, the Proposed Project would produce electric and magnetic fields. These fields have the potential to cause electromagnetic interference (EMI) in implanted cardiac devices. The predicted magnetic fields are significantly weaker than the recommended threshold for pacemakers and ICDs set by Medtronic (a major manufacturer). The electric fields produced would be below levels at which modern devices would generally be affected. There is still the potential for EMI with some pacemakers and ICDs. The common pacemaker malfunction due to electromagnetic interference is a reversion to asynchronous mode pacing which is not life threatening or harmful. Normal operation would resume when the person moved away from the source of interference.

Human Health

Based on available literature, there is no definitive evidence that HVTLs result in impacts to human health. Studies have been unable to produce a conclusive link between HVTLs and health concerns such as childhood leukemia.

D.L. Henshaw et al. have published several papers regarding the effects of power transmission and distribution on human health. The Henshaw Effect refers to a link between the electric fields associated with HVTLs and an increased risk of cancer. Henshaw reports an increase in lung deposition from inhaling electrically charged aerosol pollutants as opposed to neutral pollutants. Corona discharges from HVTL conductors cause an ionization of the surrounding air. The ions which are released can attach to aerosol pollutants which can drift away and be inhaled by or deposited on a nearby person. Henshaw has also reported an increase in the concentration and deposition of radon decay products in the vicinity of power lines that can also increase cancer risks. Other studies have been unable to support Henshaw, and the Henshaw Effect on human health is of scientific debate.

Impacts from the Proposed Project on human health are not anticipated.

Public Safety

The proposed HVTL would be equipped with protective devices to safeguard the public and de-energize the line in the event of an accident or fallen structure or conductor.
The types of impacts to public health and safety are the same for both Route 4 and Route 4A. However, Route 4 has fewer homes within proximity of the ROW than Route 4A which may decrease the potential for impacts in Route 4.

Mitigation

Significant impacts to public health and safety are not anticipated. The Applicants would comply with local, state, and NESC standards during final design and construction of the proposed HVTL. Safety procedures established by the Applicants would be followed during and after HVTL installation, and the Applicants would implement proper safeguards during construction and operation of the HVTL. The Applicants would take appropriate measures to prevent the occurrence of stray voltage along the route. The Applicants would minimize potential health effects by maximizing the distance between the transmission lines and residences.

6.4.2 Land-based Economics

Land-based economics include the natural resources and amenities that are used to derive value from activities, such as agriculture; recreation and tourism; zoning and land use; and archaeological and historic resources. General information was provided regarding land-based economics in chapter 5. The following sections provide analysis on potential impacts from the Proposed Project and possible mitigation measures for each proposed alignment.

6.4.2.1 Agriculture

Agricultural land that is designated as prime farmland indicates land that is most desirable for agricultural production. The Code of Federal Regulation 7 CFR 657 defines prime farmland as, “land that has the best combination of physical and chemical characteristics for producing food,

feed, forage, fiber, and oilseed crops and is available for these uses." Table 6-30 summarizes the acres of prime farmland soils located within the ROW for Routes 4 and 4A. Agricultural resources in the Study Area are discussed in section 5.4.1 and shown on Figure 11.

Table 6-30: Farmland Soils Within ROW

Route	Farmland Soil Classification	Acres	ROW Totals
4	All Areas are Prime Farmland	27.7	33.8
	Farmland of Statewide Importance	0.0	
	Prime Farmland, if drained	6.1	
4A	All Areas are Prime Farmland	27.7	29.1
	Farmland of Statewide Importance	1.8	
	Prime Farmland, if drained	4.7	

Source: NRCS

Impacts

The Proposed Project would result in permanent and temporary impacts to existing farmland. Temporary impacts such as soil compaction and crop damage within the ROW are likely to occur during construction. The timing of construction would dictate the level of temporary impacts with summer or fall construction potentially leading to crop damages, while winter construction would avoid crop damages. Temporary impacts in agricultural fields are estimated to affect approximately one acre per pole during construction activities. Permanent impacts would occur as a result of structure placement on agricultural land and would be confined to the area immediately surrounding each structure, which the Applicants have estimated to be 20 sq-ft. Table 6-31 summarizes the acres of agricultural related land cover within the ROW for the proposed routes.

Table 6-31: Agricultural Land Cover Within ROW

Route	Land Cover	Acres
4	Pasture/Hay	0.8
4A	Pasture/Hay	0.6

Source: NASS

The majority of the mapped prime farmland areas within Routes 4 and 4A, as well as the ATF alternatives to each route, are currently forested. In areas where an HVTL crosses an agricultural field or pasture, farming or grazing activities could continue around and under the HVTL. Only the areas where each H-frame wooden HVTL structure was placed would result in the loss of agricultural production. The total area of each HVTL structure is estimated to be 20 sq-ft, which is very small compared to the size of typical crop fields or pastures. Due to the small area of land that would either be lost from existing agricultural production or that would permanently impact areas of prime farmland significant impacts to existing agriculture lands or prime farmland soils are not anticipated as a result of the Proposed Project.

Livestock may be impacted temporarily during the construction phase of the Project. There is potential of livestock to have reduced access to pasture lands, and livestock may be subjected to construction noise. Impact of stray voltage on livestock due to transmission lines is not anticipated as a result of the Proposed Project

Mitigation

The Applicants would work with affected landowners to minimize impacts to farming operations along the route. Easements would not substantially restrict farming operations as the ROW area between structures would remain available for crop production. The Applicants would utilize previously disturbed areas for construction setup whenever possible. The Applicants would discuss the potential temporary impacts on agricultural land and request landowner permission prior to construction. Restoration would take place following construction and the Applicants would compensate landowners for crop damage or soil compaction. If required by the Department of Agriculture, the Applicants would work with the Department to develop an agricultural mitigation plan. The Applicants would try to avoid direct impacts to livestock farms and would work with individual landowners to minimize noise impacts to livestock and farm facilities during construction.

6.4.2.2 Mining and Forestry

As previously discussed in chapter 5, mining and forestry have been a historical use of the land in northeastern Minnesota and within the Study Area. The Proposed Project is directly related to the operation of the Essar Steel facility, which will actively mine taconite for steel production on-site once fully operational. The mining and forest products industries are part of the local economy and provide numerous jobs in the region. This section describes potential impacts to mining and forestry from the Proposed Project and potential mitigation measures, if required.

Mining

The Mesabi Iron Range runs northeast to southwest between the cities of Nashwauk and Taconite in the areas of Route 4 and 4A. Mining resources in the Study Area are discussed in section 5.4.2 and are shown on Figure 12.

Impacts

Essar Steel currently owns mining rights within all of Routes 4 and 4A with the exception of a half-mile wide stretch of Route 4A between Big and Little Sucker Lakes. Construction of the proposed HVTL is necessary for Essar Steel mining operations to move forward.

Mitigation

The Applicants have selected route locations that would allow Essar Steel to mine ore resources within the Study Area. The Applicants would work with existing and future mine operators to align the proposed HVTL to limit impacts to current and planned mining operations and develop mitigation measures as necessary.

Forestry

Forests are the predominant land cover in the Study Area, including a variety of coniferous, deciduous and mixed forest lands. Forestry resources in the Study Area are discussed in section 5.4.2 shown on Figure 12.

Impacts

Land that is currently a forestry resource would be permanently impacted by the proposed HVTL. Within the ROW, forested land would be converted to a non-forest use. Forested areas would be cleared to allow for construction and operation of the transmission lines. However, the impact to forested areas is small relative to the resources available in the area and the forestry economy is not likely to be affected. Table 6-32 presents detailed information regarding the forested areas within the ROW for Routes 4 and 4A.

Table 6-32: Forestry Impacts Within ROW

Route	Proposed Converted Acreage
Route 4	27.9
Route 4A	38.0

Mitigation

Timber harvested during construction would be made available to landowners for firewood, saw logs, or other uses. During construction, previously disturbed areas would be utilized for construction staging areas whenever possible. Trees and vegetation would be preserved to the maximum extent practical. Temporary access road construction would be coordinated with landowners and temporary impacts would be restored following construction. Previously forested areas, impacted by the Proposed Project, would be allowed to establish low growing species of forbs, grasses, and shrubs that would not interfere with operation and maintenance of the HVTL.

6.4.2.3 Zoning and Land Use Compatibility

The construction of a new HVTL in an area that currently does not have an existing HVTL poses a greater potential for impacts to land use and possibly zoning compatibility, as compared to constructing a new HVTL within an existing utility corridor. The Proposed Project would be located in portions of Itasca County and the cities of Nashwauk and Taconite. These local government entities consider an HVTL a compatible land use with their current respective zoning ordinances.

Impacts

The proposed Route 4 HVTL alignment would be located on Essar Steel Minnesota property within the city of Nashwauk municipal boundary (Figure 13). The city of Nashwauk has zoning authority within its municipal boundary. The City does not regulate the construction of HVTLs in the current ordinance.

The Route 4A proposed HVTL alignment would cross a farm residential zoning district and industrial zoning district in Itasca County (Figure 13). According to the Itasca County zoning ordinance, special structures do not require a building permit and are not subject to setback requirements. The proposed HVTL would be considered an essential service and a compatible use by Itasca County. Just prior to connecting with the Essar Steel Mine substation, a small portion of the proposed alignment would be located within the city of Nashwauk municipal boundary.

Mitigation

The Proposed Project is compatible with the Itasca County Zoning Ordinance and the city of Nashwauk Zoning Ordinance. No mitigation would be required for the construction or operation of the Proposed Project.

6.4.2.4 Transportation and Public Services

Transportation and utility infrastructure is established in the Study Area. The Proposed Project would cross or be located adjacent to a variety of existing roadways and infrastructure within the Study Area (Figure 14). The following sections discuss the potential impacts within the proposed HVTL alignment to transportation and public services, including existing utilities, public emergency services, roadways, railways, and airports.

Existing Utilities

Impacts

The proposed HVTL alignments for Routes 4 and 4A would run parallel to the state-approved NPUC gas pipeline for approximately 1.5 miles. However, this pipeline has not been constructed. The new H-frame wooden poles for the HVTL structures would be placed in augered holes approximately 10 to 15 feet deep. Minor grading may be required to provide level construction surfaces at each structure location. These construction activities would have the potential to impact existing underground utilities. Equipment used for augering or stringing operations is tall. Moving vehicles and cranes would have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

Moving vehicles and cranes have the potential to impact local overhead utilities, such as collector electrical or telephone systems.

When an HVTL is located adjacent to a pipeline right-of-way, the pipeline may be subject to electrical interference from electric and magnetic induction, conductive interference and capacitive effects.

Magnetic induction is the primary effect of a high voltage AC transmission line on a buried pipeline during normal (steady state) operation. Conductive interference is a concern when a transmission line fault occurs in proximity to the pipeline, as it can cause AC currents to enter the pipeline at coating holidays (i.e., flaws in the coating) and produce a voltage gradient across the pipeline coating. Capacitive effects are typically only a concern during pipeline construction when long sections of the pipeline are above ground.

If these electrical interference effects are great enough during normal operation, then a potential shock hazard exists for anyone that touches an aboveground part of the pipeline, such as a valve or cathodic protection test station. In addition, during normal operation, if the induced AC current density at a flaw in the pipeline coating is great enough, AC pipeline corrosion may occur. Lastly, damage to the pipeline coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

Although electrical interference from the close proximity of the proposed HVTL alignment to the state-approved NPUC pipeline is a possibility, no impacts are anticipated.

Mitigation

In the event that a Route Permit is granted for the Proposed Project, the Applicants would use the known locations of existing water, sewer, gas, electrical, telephone and cable lines during final engineering and design to avoid impacting these services. Upon completion of the HVTL design, the Applicants would be required to locate all of the above mentioned utilities in the field prior to HVTL construction to avoid disruption of services.

No existing pipelines would be crossed by the proposed HVTL alignments for Routes 4 and 4A, however, once the state-approved NPUC pipeline is constructed, the proposed HVTL would cross it. The NPUC has indicated that if the Essar Steel natural gas pipeline ROW would share ROW with the proposed HVTL, the pipeline's design would include analysis of AC interference levels and installation of any required AC mitigation to insure that the Proposed Project's high voltage AC transmission lines could be safely collocated with the gas pipeline.

The National Association of Corrosion Engineers has standards that ensure that pipeline integrity would not be degraded nor personnel safety compromised because of AC interference from a transmission line constructed and operated adjacent to a pipeline. AC interference effects can be predicted with computer modeling and if necessary, mitigation measures would be taken to minimize AC interference and reduce transmission impedance. None of the mitigation measures would require additional ROW. A detailed description of possible mitigation measures can be found in the Route Permit Application.

Public Services

Impacts

There are no public service facilities (city of Nashwauk) near the proposed HVTL alignments for Routes 4 or 4A. There is potential for delay in emergency service during HVTL construction; however HVTL construction is not anticipated to cause significant or long term impacts.

The Proposed Project would add a small number of workers to the area, however it would not result in a measurable increase in the demands on public services such as fire, police or local hospitals.

Mitigation

The Applicants would coordinate with emergency service providers to ensure that there would be no interruption in servicing capabilities. Accessibility to local residences by emergency service vehicles would be provided by stopping construction progress and rearranging equipment so the emergency vehicles could access the residences in need of those services.

Generally, construction activities would be staged such that public roads would be minimally impacted by lane closures or brief periods of road closures. Once construction was completed, the proposed HVTL alignment would span state, county, and township roads, and therefore would not delay emergency vehicles or services provided.

Highways and Roads

The construction period of the proposed HVTL would last for up to several months depending on route length, terrain, weather, and other factors. Construction traffic would use the existing county and state roadway system to access the Proposed Project and deliver construction materials and personnel. Major truck access to the Proposed Project is generally served by TH 65 and TH 169. Specific additional truck routes would be dictated by the location required for material delivery or staging.

Impacts

Construction personnel would use the existing county and state roadway system to access the proposed HVTL alignment to deliver construction materials and equipment during active construction of the HVTL. Increases in construction-related traffic on county and township roadways have the potential to damage the roadway system by exceeding functional weight capacity. Equipment used for construction of the proposed HVTL could also damage existing roadways by direct damage to infrastructure.

Motor vehicle traffic in the vicinity of the Proposed Project would be temporarily impacted by the increased construction traffic during the active construction phase of the proposed HVTL alignment. Light, medium, and heavy-duty construction vehicles, along with private, construction personnel vehicles, would travel to and from the construction site.

Maximum traffic volumes are anticipated to occur during pole and line assembly. Traffic disruption associated with construction would be localized for short, temporary periods. At the completion of the HVTL, equipment would be removed from the site or reduced in number. HVTL construction in Route 4 or Route 4A is not be anticipated to result in permanent traffic impacts.

Route 4 would cross one CSAH, one county road, and one township road. The proposed HVTL alignment would not run parallel to existing roadways. The AADT for each road network in Route 4 is listed below in Table 6-33.

Table 6-33: AADT for Route 4 HVTL Alignment Crossings

Road Network	AADT	Survey Year
CSAH 58	90	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

Route 4A would cross one CSAH, one county road, and one township road. The proposed route would not run parallel to existing roadways. The AADT for each road network in Route 4A is listed below in Table 6-34.

Table 6-34: AADT for Route 4A HVTL Alignment Crossings

Road Network	AADT	Survey Year
CSAH 58	90	2005

Source: MNDOT, http://www.dot.state.mn.us/traffic/data/html/volumes.html

The proposed HVTL alignment would require the installation of new or temporary access roadways adjacent to the Route in order to allow construction equipment access to the proposed

alignment during construction and operation of the HVTL. Existing and new access roads would serve to connect the proposed HVTL ROW with the existing roadway system.

Long term impacts to the transportation network from the Proposed Project beyond the construction period are not anticipated.

Mitigation

Traffic management and control of local roadways would be considered in the planning and implementation. If applicable, some construction activities would require re-routing of traffic for roadway crossings during active stringing of overhead conductors.

Construction of the Proposed Project would be in accordance with all associated federal and state permits and laws, as well as industry construction standards. Transportation disruptions are anticipated to be localized, temporary and intermittent for the construction periods required to erect the pole structures. Access easement agreements would be obtained prior to construction and would be maintained to allow for access to ROW during the construction and operation of the proposed HVTL. The Applicants would also coordinate with MNDOT, Itasca County, and local government units to obtain the necessary over width/overweight permits as needed for trucks and heavy equipment, and acquire the necessary utility crossing permits. The Applicants would also coordinate temporary road or lane closures due to materials delivery or construction, such as HVTL stringing over public roadways, with the appropriate entities.

Damage to public roads would be repaired in accordance with applicable laws and permits, and damage to private roads would be promptly repaired unless otherwise negotiated with the affected landowner. Traffic management and control of local roadways would be considered in the planning and implementation of HVTL construction, especially when crossing public roads. These measures minimize the potential for traffic disruptions. The Applicants may be required to secure a bond with the jurisdictional county or township in order to provide assurance that repairs would be made if roadways are damaged during construction.

The Applicants would work closely with private landowners to locate HVTL access roads, while minimizing disruptions to land use or the existing rural roadway network. Similarly, close coordination with the local townships would be required to locate final ROW access roads. If loss or damage to property occurs, landowners would be compensated by the Applicants based on agreements made prior to HVTL construction.

Transporting heavy components for construction of the proposed HVTL would be dictated by seasonal roadway restrictions for the area. Mitigation for road impacts would include an agreement between the Applicants and the potentially affected community for damage to roadways associated with large truck and increased small vehicle traffic, over width/overweight vehicles, or general construction activities.

If applicable, some construction activities would require re-routing of traffic during roadway crossings during active stringing of overhead conductors to avoid traffic impacts. The Applicants would be responsible for contacting the Itasca County Sheriff's Department or local-servicing Police Department when crossing public roadways. Temporary guard structures would also be required to protect construction crews and the general public during HVTL construction. Guard structures would maintain necessary vertical clearance and traffic flow. The HVTL would be above ground and would span roads and highways after completion of construction.

Railways

The proposed Route 4 HVTL alignment would follow a new utility ROW on the Essar Steel Minnesota property for approximately 1.5 miles. The new utility ROW includes Essar Steel's rail line that is currently under construction. The proposed HVTL alignment for Route 4A would not run near or cross rail lines.

Impacts

In addition to the roadway system, construction materials may potentially be hauled on the existing railway network. This may cause a slight increase in rail traffic, but is not anticipated to be significant impact. The increased rail traffic would be temporary during active construction of the proposed HVTL. No additional rail lines are needed to accommodate the potential temporary increase in rail traffic.

When an HVTL is located adjacent to a railway, there is potential for a railway's tracks and signals to be affected by electrical interference from capacitive, electric and magnetic, and conductive effects. If a transmission line is located in proximity and parallel to a railway for long distances, all these interference mechanisms can cause high currents and voltages to develop on the railway's tracks and communication cables. If the AC interference is above certain thresholds, it can result in personal safety hazards, damage to signal and communication equipment, and false signaling of equipment. Greater detail on the causes of electrical interference in the vicinity of railway tracks is provided in the Route Permit Application.

Mitigation

Construction of the HVTL has to be carefully coordinated and properly designed to avoid impacting rail operations. The Applicants would be required to secure a bond with BNSF Railroad to ensure proper repair of damages to existing rail infrastructure if they occur during construction of the Proposed Project. The Applicants would need to carefully coordinate design and construction of the HVTL with the BNSF Railroad to ensure daily rail operations would continue unimpeded.

AC interference effects can be predicted with computer modeling. With proper planning and mitigation management, railways and high voltage AC transmission lines can be safely collocated. The American Railway Engineering and Maintenance-of-Way Association has specifications for steady state rail-to-ground and equipment-to-ground voltage levels to insure safety of railway operating personnel and the public.

The Nashwauk Public Utilities has indicated that if the proposed transmission line (Route 4A) is collocated with the Essar Steel Project's railroad (under construction) the railroad's design would include an analysis of AC inference levels and installation of any required AC mitigation. If mitigation is determined to be required; depending on AC interference levels, several mitigation methods may be used. These include reducing the distance between insulated joints in track sections, grounding the railroad's tracks, and burying gradient control wires or matting. It is unlikely that installing any of the aforementioned mitigation methods would require additional right-of-way. Additional detail on the mitigation measures proposed by the Applicants is provided in the Route Permit Application.

Airports

There are no airports or airstrips located in close proximity to the HVTL alignments in Routes 4 or 4A. Construction and operation of the proposed HVTL alignment for Routes 4 and 4A would not impact local airports, landing strips, or airplane safety. Therefore, no mitigation has been proposed.

6.4.2.5 Recreation

The construction of an HVTL has the potential to impact recreational resources and recreational experiences, specifically the use of snowmobile trails. This Draft EIS determined where potential impacts to recreational resources from the Proposed Project could occur based on the proposed HVTL alignment.

No trails, public lands, or other recreational facilities have been identified within or in proximity to Route 4 or Route 4A (Figure 15). No impacts to recreation are anticipated in Routes 4 and 4A, and no mitigation has been proposed.

6.4.2.6 Archaeological and Historic Resources

The construction of an HVTL has the potential to disturb land and can alter landscapes by potentially introducing a new visual impact. These impacts can potentially affect the integrity of archaeological and historic resources within a project's vicinity. There are no confirmed archaeological or historic resources located within the proposed HVTL alignments for Routes 4 and 4A.

An unconfirmed report of Native American burial mounds, located near Little Sucker Lake, was listed for the Study Area. It is uncertain whether these burial mounds exist or whether the proposed HVTL alignment for Routes 4 or 4A would impact them. As previously discussed in section 5.4.6, there may be additional archaeological and historic resources in the Study Area that have not yet been identified or recorded by SHPO. Unknown resources have the potential to be impacted by the Proposed Project primarily during the construction phase. The Proposed Project is not anticipated to cause adverse impacts to archaeological and historic resources. Additional information on potential impacts to archaeological and historic resources from the Proposed Project is provided in section 6.1.2.6.

Mitigation

No adverse impacts to identified sites are anticipated. If currently unidentified sites are discovered during construction, the Applicants would coordinate directly with SHPO and would determine the proper measures to minimize or mitigate for impact to the sites.

The Applicants indicated in the Route Permit Application that the potential existence of the Native American burial mounds near Little Sucker Lake needs to be further investigated prior to construction. If burial mounds are discovered, measures to avoid and not disturb the burial mounds would be taken in accordance with Minnesota Statute 307.08.

The Applicants would also integrate into the construction bid documents a training, monitoring and discovery plan should previously unknown cultural resources or human remains be

inadvertently encountered during construction. Additional detail on the training, monitoring and discover plan are provided in 6.1.2.6.

6.4.3 Natural Environment

HVTL projects typically traverse miles of land through undeveloped areas and along existing utility corridors. Natural resources typically influence the design, alignment, and construction of a new route based on topography and other natural features, such as lakes, forests, and wetlands.

Chapter 5 provided information on the existing conditions of the natural environment of the Study Area, including air quality; water resources; wetlands; flora and fauna; and rare and unique natural resources and critical habitat. Potential impacts within the proposed HVTL alignment related to the natural environment and possible mitigation measures are discussed in the following sections.

6.4.3.1 Air Quality

The Proposed Project has the potential to affect air quality in the area through corona effects and from leaks of the Greenhouse Gas SF_6 at the electrical substations. In addition, there may be limited short term emissions from vehicle exhaust and fugitive dust during construction of the transmission line. Additional information regarding potential impacts to air quality from the Proposed Project is provided in section 6.1.3.1.

6.4.3.2 Water Resources

There are a significant number of water features located within Itasca County and the Study Area. The lakes, rivers and streams in the Study Area as well as a description of the floodzones and groundwater resources are provided in section 5.5.2 of this Draft EIS (Figure 16). Construction of the Proposed Project would occur near, over and adjacent to a variety of surface and groundwater features. A discussion of the potential impacts to surface water, floodzones, and groundwater resources is provided as well as potential mitigation measure that would be required.

Impacts

Surface Water

There are lakes located adjacent to Routes 4 and 4A, which are Big Sucker Lake, Little Sucker Lake and Little McCarthy Lake. However, there are no lakes located within Route 4 or Route 4A. As a result the proposed HVTL alignments within Routes 4 and 4A would not create new lake utility crossings. There are four streams that pass through Route 4 and four streams that pass through Route 4A (Figure 10). All of these streams are unnamed tributaries to Sucker Brook. The proposed HVTL alignment would cross over all four streams in Route 4, creating four new stream utility crossings. The proposed HVTL alignment would cross over all four streams within Route 4A, creating four new stream utility crossings.

Construction of the proposed HVTLs would result in new stream utility crossings for both Route 4 and Route 4A.

Impacts to surface waters from the construction of the Proposed Project could occur as a result of vegetation clearing within the ROW, as well as site grading and structure placement at each of the transmission line pole locations. These project related activities could result in erosion that could lead to sediment runoff into adjacent lakes, rivers or streams. Impacts are most likely to occur at

HVTL construction or ROW clearing locations adjacent to water bodies or at stream or lake utility crossings. There would be some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to local surface waters.

Floodzones

There are no FEMA defined floodzones associated with the lakes and streams located within or immediately adjacent to Route 4 and 4A. As a result, the new stream utility crossings associated with the Applicants' proposed HVTL alignments in Routes 4 and 4A would not result in impacts to floodzones.

Groundwater

The Study Area is located within the groundwater recharge area known as the Mississippi River Headwaters (HA-278). Within this area, bedrock is typically located between five and over 500 feet below the ground surface. Groundwater aquifers in this region are typically five to 50 feet in thickness within gravel soils located from 50 to 500 feet below the land surface. The proposed wooden H-frame transmission line poles would be placed in augered holes at depths of 10 to 15 feet below the surface. Therefore the HVTL poles would not intercept groundwater aquifers in the area. Additionally due to the depth of the local groundwater aquifer it is unlikely that temporary dewatering would be required during HVTL construction. There would some hazardous materials used and stored temporarily during the construction of the Proposed Project such as transmission fluid or diesel fuel. If not handled and stored properly a spill of these materials could create an impact to the local groundwater aquifer.

Mitigation

The Applicants would be required to obtain permits from the MNDNR and MPCA for potential impacts to surface waters.

Construction of the HVTL within Route 4 or Route 4A would occur near or adjacent to water bodies. No lakes would be crossed by the construction of the HVTL in Route 4 or Route 4A. Each proposed HVTL alignment would result in four new stream utility crossings. The Applicants would be required to obtain a permit from the MNDNR for the new stream utility crossings. It is unlikely that the MNDNR permit would allow the placement of HVTL poles within streambeds. However, if it was not possible to avoid placement of HVTL poles within a streambed, the Applicants would also be required to obtain a work in public waters permit from the MNDNR. This permit would require the Applicants to provide a plan for minimizing disturbance of habitat and water quality within the stream.

The Proposed Project would disturb more than one acre of land and as a result would be required to obtain an NPDES construction permit from the MPCA. The NPDES permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP). Within the SWPPP, the Applicants would be required to identify specific construction BMPs that would be implemented to minimize impacts to the water quality of surface waters adjacent to or within the HVTL construction ROW. Construction BMPs would include items such as silt fences, bio-roles, staked bales or silt curtains. Once construction is complete the disturbed areas would be restored to the previous vegetation condition if possible. In the case of forested lands, vegetation would be replaced with an approved native grass seed mixture to establish suitable low height vegetative cover. Upon completion of vegetation restoration within the ROW sediment runoff would be

similar to conditions prior to construction. The implementation of the construction BMPs in the SWPPP would ensure minimal impacts to water quality of adjacent water bodies.

Floodzones would not be impacted by HVTL construction within Route 4 or Route 4A. Groundwater aquifers are located below the depth of construction for the HVTL poles. The NPDES construction permit that would be required for the Proposed Project would addresses the handling of stored construction materials, including items such as diesel fuel or transmission fluid. If a spill occurs, the Applicants would be required to implement the measures identified in the NPDES construction permit to minimize impacts to surface water or groundwater resources. In the event of a spill of more that five gallons, the Applicants would be required to contact the MPCA state duty officer and then would be required to conduct spill remediation activities as direct by the duty officer.

6.4.3.3 Wetlands

The Proposed Project is located in Itasca County, which has an abundance of wetlands of varying types. Chapter 5 of this Draft EIS provides information on the wetlands located within the Study Area (Figure 17). The following sections discuss potential impacts to wetlands located within the proposed HVTL alignments and possible mitigation measures for impacts to those wetlands.

Impacts

Wetlands within Route 4 and 4A were identified using NWI data in section 5.5.2 and are displayed in Figure 10. The regulatory framework in regard to wetlands is also described in section 5.5.2.

The proposed HVTL alignment encompasses a 130 foot wide ROW within each route. Table 6-35 compares and summarizes wetland areas within each proposed HVTL 130 foot ROW by total wetland area and by wetland type.

Table 6-35: Wetlands Within Route 4 and 4A Proposed HVTL ROW

	Type 1-Seasonally Flooded Basin (acres)	Type 2-Wet Meadow (acres)	Type 3-Shallow Marsh (acres)	Type 4-Deep Marsh (acres)	Type 5-Shallow Open Water (acres)	Type 6-Shrub Swamp (acres)	Type 7-Wooded Swamp (acres)	Type 8-Bog (acres)	Total Wetland Area (acres)
Route 4	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	**0.8**
Route 4A	0.0	0.0	0.0	0.0	0.0	3.1	8.1	0.0	**11.2**

Three types of wetland impacts would potentially occur from the Proposed Project: permanent impacts, temporary impacts, and conversion of wetland type. Impacts would be quantified by the Applicants prior to construction.

Permanent impacts would occur from dredging or filling during installation of structures associated with the HVTL. The Route Permit Application indicates that the construction of an H-frame wooden HVTL structure impacts 20 sq-ft of land. Permanent impacts to wetland encompassing approximately 20 sq-ft per structure would occur from filling activities that would be necessary wherever a structure would be installed within a wetland. Structures would be

installed within wetlands that could not be avoided by the H-frame structure spacing, which would vary from 600 to 1,000 feet.

Temporary impacts to wetlands within the proposed HVTL alignment would occur from construction activities within the wetland basins including temporary vegetation removal or soil compaction. Temporary impacts would be caused by crossing the wetland during construction of the HVTL.

Impacts classified as conversion of wetland type would occur wherever vegetation is permanently cleared within the HVTL ROW. Woody forested vegetation would likely be the only vegetation type that would be permanently cleared. As a result, the Proposed Project would potentially convert wetland types with woody vegetation, shrub swamp (Type 6) and wooded swamp (Type 7), into wetland types such as wet meadow (Type 2) or shallow marsh (Type 3) that would have similar hydrologic regimes but would be dominated by non-woody species.

Shrub swamp (Type 6) and wooded swamp (Type 7) are wetland types containing woody vegetation found in Route 3 and Route 3A that would be potentially converted to a different wetland type. As shown in Table 6-35, the proposed HVTL ROW in Route 4 would impact 0.8 acres of wooded swamp while Route 4A would impact a combined area of 11.2 acres of shrub swamp and wooded swamp.

Indirect wetland impacts would potentially occur if impacts outside of the HVTL ROW are caused by Project activities. They would result from a direct physical alteration that occurs within the HVTL ROW (filling, excavation, vegetation clearing) that may indirectly affect characteristics of wetlands, such as vegetation type, hydrology, or wetland functions, outside of the HVTL ROW.

For unavoidable wetland impacts, the permitting process determines the wetland mitigation ratio and type of wetlands created.

Mitigation

Regulatory agencies with jurisdiction over wetlands within the Study Area are identified in section 5.2.2. Regulatory processes require documentation of existing wetland boundaries, quantification of proposed wetland impacts, and documentation of project sequencing. Project sequencing includes wetland impact avoidance and minimization efforts, as well as proposed mitigation for unavoidable impacts.

Unavoidable impacts to wetland from the Proposed Project must be mitigated as required by state and federal regulatory requirements. The mitigation ratio (i.e., the amount of wetland that must be created to replace impacted wetlands) is determined in the permitting process. The permitting process also ensures that equivalent wetland types are created.

The mitigation ratio is also influenced by a number of other considerations, including:

- the type of impact (i.e., permanent, temporary or conversion of type);
- whether mitigation is completed concurrently or prior (in-advance) to wetland impacts;
- location of the mitigation wetlands relative to the impact wetlands (in-place);
- the type of mitigation wetlands relative to the impact wetlands (in-kind);
- the type of mitigation proposed, such as creation, restoration, or preservation; and
- winter time construction may be considered in an effort to minimize impact to vegetation communities.

The overall goal of the regulations is to replace wetland impacts with wetlands that are of the same type, provide similar functions, and are of comparable or better quality compared to the impacted wetlands.

Permanent wetland impacts within Route 4 and Route 4A would be quantified by the Applicants, and a wetland replacement plan would need to be submitted to regulatory agencies and approved prior to the start of construction. The Applicants would avoid permanent wetland impacts within Route 4 and 4A by spanning wetlands wherever possible. Where wetlands are too large to span and construction of structures are necessary in the wetland, the Applicants would minimize wetland impacts to the greatest extent possible. The Applicants have also committed to additional minimization efforts that are identified in the Route Permit Application.

Temporary wetland impacts would occur within Route 4 and Route 4A where wetlands would need to be crossed during HVTL construction. Temporary impacts are regulated differently by state and federal agencies. WCA allows for temporary impacts for up to six months without requiring mitigation as long as areas are restored to original conditions at the completion of construction. The USACE has required permanent wetland replacement for temporary impacts to wetlands (six months or less) in the past for other projects. The replacement ratios used by the USACE for temporary wetland impacts typically range from 0.1:1 to 0.5:1. Potential temporary wetland impacts would need to be quantified by the Applicants prior to the start of construction. Areas of temporary wetland impact would be restored as required at the completion of construction activities.

The USACE may regulate the temporary or permanent conversion of wetland type by requiring mitigation at a ratio generally ranging from 0.1:1 to 0.5:1, depending on the type of wetland that is impacted. Generally, the USACE would be most concerned with the conversion of wetlands of Type 6 and Type 7 basins to wetland types containing non-woody vegetation. The USACE may require a case-by-case evaluation to determine the required compensation for wetland impacts.

WCA does not specifically regulate conversion of wetland type through the clearing of vegetation if the activity does not involve draining, filling, or excavating. Itasca County SWCD, as the responsible WCA agent, has the authority to interpret whether activities associated with clearing constitute draining, filling, or excavating result in impacts, and therefore would require mitigation.

Indirect impacts to wetlands would be avoided by the Applicants by using sound construction practices.

6.4.3.4 Flora and Fauna

The Proposed Project would result in the alteration of the vegetation and wildlife habitat conditions in the Study Area. Alterations would occur through the establishment and maintenance of ROW and the construction of new HVTLs. A description of the potential impacts to vegetation, wildlife habitat, wildlife populations and fisheries resources, along with required mitigation, is provided in this Draft EIS.

Impacts

Vegetation

The Applicants have proposed to establish 130 foot wide ROW for construction and operation of the proposed HVTL. Land cover within the Study Area is presented in Figure 18. An analysis of the land cover and vegetation communities within the new 130 foot ROW was conducted for the proposed HVTL alignments in Route 4 and Route 4A. The ATF did not identify alternative alignments for Routes 4 and 4A. The vegetation communities within the 130 foot ROW for each of the two alignments are presented in Table 6-36.

Table 6-36: 2008 NASS Land Cover Analysis for Each HVTL Alignment

Land Cover Class	Route 4 Alignment	Route 4A Alignment
Deciduous Forest	98.6	92.2
Developed	18.3	18.1
Evergreen Forest	16.0	16.7
Grassland	7.8	8.6
Herbaceous Wetlands(1)	32.3	35.9
Open Water	2.2	2.2
Pasture/Hay/Crop	13.6	12.9
Shrubland	22.6	24.5
Woody Wetlands(1)	15.7	15.8
Total	227.0	227.0

(1) NASS wetland categories do not match NWI wetland classifications used for detailed analysis of wetland impacts in section 6.4.3.3.

The establishment of new ROW for the construction of the proposed HVTL would result in clearing of trees within forested lands, including woody wetlands. After construction of the HVTL, a new low lying native ground cover would be established within the HVTL ROW. This would result in the loss of forested vegetation. For the other land cover types, such as grasslands, shrublands and herbaceous wetlands, the establishment of new ROW and construction of the proposed HVTL would have less of an impact on the vegetation community. Vegetation within grasslands and herbaceous wetlands would be reestablished with vegetation communities similar to the existing vegetation. For shrublands, some taller shrubs may be permanently removed, but in general this vegetation community would not be significantly altered by the establishment of the new ROW and construction of the proposed HVTL.

Forested lands cleared to establish the ROW for the HVTL would be replaced by a new low lying vegetation community of grasses.

Another potential impact to vegetation communities during ROW clearing and construction would be the introduction or spread of invasive plant species or noxious weeds. When established vegetation is cleared for a construction project, invasive or noxious weeds can become established because they are typically early colonizing species that grow quickly on disturbed areas. Under worse case situations, once established invasive plant species alter habitats and reduce biodiversity (USDA, 2008). Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds.

Wildlife

Wildlife habitat would be altered as a result of the Proposed Project. The most significant alterations would occur in the form of ROW clearing within forested lands. Forested areas would be cleared of trees that would interfere with the operation and maintenance of the HVTL. The conifer and deciduous forest communities would be replaced with a low lying vegetative cover, consisting mainly of grasslands. The acres of forested lands within the 130 foot ROW of the proposed HVTL alignment in Route 4 and Route 4A are presented in Table 6-36. However, this land would not be completely lost as wildlife habitat as would be the case if the land was converted to urban or industrial uses. Instead it would simply be altered to a different vegetation community. The establishment of a new grassland community in the HVTL ROW would provide additional habitat for some wildlife species.

Clearing of ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area. Large equipment would create noise causing wildlife to avoid the area temporarily. However, the 130 foot ROW is relatively narrow compared to the large habitat tracks that are within the Study Area and adjacent to the HVTL alignments. The majority of wildlife within the Study Area and along the Iron Range has become accustomed to human disturbance from logging, mining or other human developments. As a result the wildlife living within the overall Study Area and along the proposed HVTL alignments would likely disperse to available adjacent habitat. In general the amount of habitats that would be impacted by the construction of the Proposed Project is small compared to the amount of available habitat in the Study Area.

Clearing the ROW for construction of the HVTL would cause a temporary disturbance to the wildlife in the area.

The use of large construction equipment to clear the ROW and construct the HVTL may result in some local mortality to wildlife that is not able to quickly disperse to available adjacent habitat. Small or slow moving birds, mammals, amphibians and reptiles may not be able to avoid the large, fast moving, mechanized equipment. This has the potential to disturb or destroy nests or burrows with juvenile wildlife that is incapable of dispersing and may also result in direct mortality to some species. However, due to the relatively narrow width of the 130 ROW compared to the large habitat tracts in the Study Area and Itasca County, wildlife mortality would be to local individuals and is not anticipated to result in population level impacts. In general, the impacts to wildlife habitat and wildlife populations from the Proposed Project are expected to be small.

Fisheries

The construction of the proposed HVTL would result in new water body crossings. The lakes and streams that would be crossed by the proposed alignments for Route 4 and Route 4A are described in section 6.4.3.2. The clearing of the HVTL 130 foot ROW and grading to construct HVTL structures has the potential to result in sediment erosion or water quality impacts to adjacent lakes and streams.

H-frame structures would be 600 to 1000 feet apart, which would allow for spanning of most lakes, rivers and streams crossed by the HVTL.

The spacing of the H-frame wooden transmission line structures proposed by the Applicants would be 600 to 1000 feet. This would allow the Applicants to span most lakes, rivers and streams crossed by the proposed HVTL alignments, limiting impacts to aquatic habitat or water quality.

Transmission pole structures placed within stream or lake beds, or immediately adjacent to lakes or streams would have the greatest potential of resulting in sedimentation, water quality impacts or alteration of aquatic habitat. The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings in Minnesota. These required permits would limit or eliminate the placement of HVTL structures within lakes or streams. After completion of ROW clearing and HVTL construction, low lying vegetative cover would be established within the ROW, which would return the land to a condition similar to pre-construction. The establishment of new vegetation within the ROW would minimize or eliminate the potential for long term water quality or sediment impacts from the Proposed Project. Overall, the impacts to water quality and aquatic habitat from the Proposed Project are expected to be small.

Mitigation

The construction of the Proposed Project, including the establishment of new ROW and construction of the HVTL, would result in impacts to wildlife habitat and may result in impacts to local wildlife populations, water quality or aquatic habitat. During public scoping for this Draft EIS, residents identified concerns over impacts to mature forest stands. In the event the a Route Permit is granted for the Proposed Project the Applicants would work directly with land owners during the easement acquisition process to identify habitat or forest concerns and make appropriate adjustments to the HVTL alignment to minimize the loss of mature forests. Impacts to wetland habitats would require a permit from Itasca County and/or the USACE prior to construction, which would require the development of an acceptable mitigation strategy to offset wetland habitat impacts from the Proposed Project. Additionally, the Applicants would be required to conduct field surveys to delineate wetlands or identify sensitive biological resources and/or habitats for the selected routes. The results of the field surveys would be potentially used to alter the HVTL alignment in order to minimize the overall impacts to vegetation, wildlife habitats or wetlands.

The ROW clearing for the Proposed Project may result in the spread or introduction of noxious weeds or invasive plant species. Minnesota Statutes, section 18.78 requires property owners to eradicate or control noxious weeds. The Applicants have stated in the Route Permit Application that prior to construction, a designated inspector would conduct a field review for noxious weeds in areas designated for ROW, construction or staging activities. The Applicants would attempt to control the spread of noxious weeds during construction. Additionally, the Applicants would comply with all noxious weed laws in Minnesota and would control noxious weeds that are found in the ROW during vegetation maintenance activities.

The Applicants would be required to obtain a permit from the MNDNR for all public water utility crossings. These permits would limit or eliminate the placement of HVTL structures within streams or lakes and would identify measures that would be required to reduce impacts to water bodies during the construction of utility crossings. Prior to construction, the Applicants would be required to obtain an NPDES construction permit and develop a SWPPP for the Proposed Project. The NPDES permit and SWPPP would identify construction practices and BMPs that would be followed to limit habitat disturbance and minimize or eliminate impacts to water quality and aquatic habitat.

6.4.3.5 Rare and Unique Resources and Critical Habitat

The Proposed Project would result in the disturbance of vegetation communities within the Study Area, including forests, grasslands and wetlands. Some of these communities would be altered,

which could result in an impact to habitat required by threatened, endangered or rare plants or animals. The known existing threatened and endangered plants and animals in the Study Area are discussed in section 5.5.5 of this Draft EIS.

Impacts

The construction of the proposed HVTL for Routes 4 and 4A would result in the creation of new utility ROW. Establishment of new ROW and construction of the proposed HVTL would result in crossing water bodies and impacts to wetland and forest communities. However, there are no known records of state or federally listed threatened, endangered or special concern plant or animal species within Route 4 or Route 4A. As a result, the establishment of ROW and construction of the proposed HVTL for Route 4 or Route 4A would not result in impacts to threatened, endangered or special concern plant or animal species.

Mitigation

Establishment of new ROW and construction of new transmission line for the proposed HVTL alignments in Route 4 and 4A would not impact threatened, endangered or special concern plants or animals. As a result, no mitigation has been proposed.

Table 6-37: Routes 4 and 4A and ATF Group Alignment Summary of Potential Effects

Topic	Route 4 (Preferred)	Route 4A (Alternate)	Summary of Potential Impacts
Effects on Human Settlement			
Proximity to Structures/Displacement	Zero homes within 500 ft. of the proposed HVTL.	Five homes within 500 ft. of the proposed HVTL.	Route 4 is on Essar Steel property and is not adjacent to homes. No displacement would occur.
Property Values	Impacts to property values can not be determined with certainty, but are tied to a number of factors, including condition of the property, housing market, proximity to the HVTL, aesthetics, and buyer's opinion		
Aesthetics	The Proposed Project would introduce a new visual impact for those homes closest to the proposed alignment that do not have vegetative or topographical barriers as visual screening. Visual impacts may also be created at water body or trail crossings.		
Noise	The Proposed Project would not exceed MPCA noise standards. Noise is anticipated to be minimal to inaudible beyond the proposed HVTL alignment ROW. No houses are located in the ROW in Route 1, Route 1A or the ATF alignments.		
Interference	Impacts to omnidirectional and unidirectional signals are expected to be minimal from the Proposed Project. Some disruption of AM radio or analog television signals may occur but would only likely occur directly below the HVTL.		
Public Health and Safety	Impacts to public health and safety from the Proposed Project are not anticipated. The Applicants would comply with all local, state and NESC safety standards during design, construction, operation and maintenance of the proposed HVTLs.		
Effects on Land-based Economics			
Agriculture	0.8 acres of agricultural lands within ROW.	0.6 acres of agricultural lands within ROW.	Farming and grazing activities could continue around and under HVTLs. A very small amount of agricultural land would be lost to production.
Mining and Forestry	27.9 acres of forested lands within ROW.	38.0 acres of forested lands within ROW.	Forested lands would be lost from timber production due to ROW clearing. Impacts would be small compared to regional forest resources.
Zoning and Land Use Compatibility	The proposed HVTLs are a compatible use within Itasca County and the city of Nashwauk. Zoning or land use variances or special permits would not be required.		
Transportation and Public Services	The Proposed Project would not impact local public services such as police, fire or medical. Some temporary road closures during construction may require coordination with local emergency services. The Applicants would obtain local and MNDOT permits for all road utility crossings. Traffic patterns may experience temporary disruption during construction but would not be permanently altered. Railroad and airport traffic and use would not be disrupted.		
Recreation	No trails or public lands would be crossed.	No trails or public lands would be crossed.	No recreational impacts are anticipated from HVTL construction in Route 4 or 4A.

Topic	Route 4 (Preferred)	Route 4A (Alternate)	Summary of Potential Impacts
Archaeological and Historic Resources	There are no historic or archeological sites near Route 4 or Route 4A. No adverse impacts to historic or archeological sites are anticipated. The Applicants will investigate the potential presence of native burial mounds near Little Sucker Lake. The Applicants will coordinate with SHPO in the event that archaeological resources are discovered during HVTL construction.		
Effects on the Natural Environment			
Air Quality	Temporary fugitive dust impacts would occur during construction but are expected to be minor. Construction and operation of the HVTL would not be a significant source of air emissions.		
Water Resources	No lake utility crossings and four stream utility crossings would result from HVTL alignment.	No lake utility crossings and four stream utility crossings would result from HVTL alignment.	MNDNR permits would be required for public water utility crossings. The Proposed Project would not impact floodzones or groundwater resources. BMPs would be implemented during construction to minimize water quality impacts.
Wetlands	0.8 acres of wetlands and 0.8 acres of forested wetlands within ROW.	11.2 acres of wetlands and 11.2 acres of forested wetlands within ROW.	Wetland impacts for the Proposed Project would require a permit from Itasca County SWCD and/or the USACE. A mitigation plan would be required to offset impacts to wetlands basins or vegetation.
Flora and Fauna	27.9 acres of forested habitat would be impacted.	38.0 acres of forested habitat would be impacted.	Forested habitat would be lost as ROW is cleared. Impacts, including mortality may occur to local wildlife but would not result in population level impacts
Rare and Unique Resources/Critical Habitat	No known occurrences of threatened or endangered plant or animal species within route.	No known occurrences of threatened or endangered plant or animal species within route.	The Applicants would coordinate with the MNDNR in the event that threatened or endangered species are discovered during wetland or other field surveys.

6.5 REJECTED ALTERNATIVE ROUTES

Minnesota Statutes 216E.04, subd. 3 require the Applicants to identify other sites or routes that were considered and rejected within the Route Permit Application. In accordance with Minnesota Statute requirements, the Applicants developed a route selection rationale. The route selection rationale used transmission planning, designing, engineering, and environmental criteria to identify preferred and alternate routes, as well as routes that were rejected from further consideration. The main factors in the route selection rationale included the following:

- Follow existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries when feasible;
- Minimize route length;
- Avoid populated areas where feasible;
- Avoid major environmental features where feasible;
- Maximize transmission system reliability and promote system redundancy where feasible; and
- Avoid airports and other conflicting land uses.

The Applicants eliminated several route segment alternatives from consideration. The most common reasons for eliminating route segments were to avoid residential impacts, wetlands, lakes and large forest complexes. A number of segments were also rejected because adjacent segments were eliminated and there was no longer a connection to the route.

There were a total of 106 different route segments considered and rejected for the Proposed Project. This totaled approximately 126 miles of potential routes to accomplish the Proposed Project objectives. There were 40 segments, totaling approximately 39 miles considered and rejected for Route 1. For Route 2, 50 segments totaling approximately 68 miles were considered and rejected, and Route 3 has 16 segments, totaling approximately 19 miles considered and rejected. Appendix E provides a complete listing of the rejected route segments, the reasons for rejection, and the location description for each segment.

6.6 SUBSTATION AND ALTERNATIVES

Three substations are necessary for the Proposed Project. The Applicants are proposing to construct two new 230 kV substations and modify the existing Minnesota Power 230 kV Blackberry substation. Construction of the substations would occur within the proposed substation boundaries located on Essar Steel Minnesota property. The substation boundaries would be fenced and located adjacent to existing and future roadways and mining facilities. The Blackberry substation would be modified and expanded within the existing substation fence line, which is on Minnesota Power property. Figure 10 shows the locations of the substations.

> Construction of the substations would occur within the proposed substation boundaries located on Essar Steel Minnesota property.

Construction of the proposed substations would begin once the final design is complete and the property or easements are acquired. A detailed construction schedule would be developed with consideration for crew availability, weather conditions, spring load restrictions on roads, and other restrictions placed on certain areas for minimizing impacts from construction.

All vegetation would be removed from the substation footprint area, the driveway area, and a buffer area of 20 feet outside the substation fence. Other vegetation outside of these areas would be undisturbed with the exception of where the HVTL enters the substation.

The Applicants have indicated that erosion control measures would be used at the site to control and minimize runoff during construction. Construction of the substations would occur in compliance with applicable requirements of the National Electrical Safety Code (NESC), Occupational Safety and Health

Act (OSHA), and state and local regulations. Maintenance of the substations would include regular inspections and necessary repairs. Routine maintenance would include removal of undesirable vegetation that may interfere with the operation of the substation.

Essar Steel Plant Substation

The Essar Steel Plant substation would require approximately 4.5 acres of land northeast of the intersection of CSAH 58 and Hilltop Road on the north edge of the steel plant operations area. The Plant substation would be connected to the Shannon end of the 94 Line via Route 1 or 1A; the Blackberry substation via Route 3 or 3A; and the proposed Mine substation via Route 4 or 4A.

The fenced substation area would be approximately 600 feet by 500 feet and require an access road. Approximately seven acres of land would be cleared and graded to construct the proposed steel plant substation. After site grading, a perimeter fence would be installed and construction of the substation would begin.

Essar Steel Mine Substation

The Essar Steel Mine substation would require approximately 1.4 acres of land. The Mine substation would be connected to the Boswell end of the 94 Line via Route 2 or 2A and the proposed Plant substation via Route 4 or 4A. The fenced substation area would be approximately 350 feet by 300 feet and require an access road. Approximately three acres of land would be cleared and graded to construct the proposed steel plant substation. After site grading, a perimeter fence would be installed and construction of the substation would begin.

Blackberry Substation Expansion

The Blackberry substation is an existing facility. Modifications to the Blackberry substation would occur within the substation fence line, therefore no vegetation clearing would be required. Impacts from the modification and expansion of this substation are not anticipated. No mitigation has been proposed.

Potential impacts from the proposed substations and possible mitigation measures are described in the sections that follow. Alternative locations for substations have not been identified.

6.6.1 Human Settlement

The following sections provide descriptions of potential impacts to human settlement due to the construction of the substations associated with the Proposed Project. These subcategories were identified in the FSDD, and background information and current conditions were described in chapter 5 of this Draft EIS.

6.6.1.1 Proximity to Structures and Displacement

Impacts

Plant Substation

The nearest residence to the proposed Steel Plant substation is located approximately 0.6 miles from the perimeter fence of the facility on CR 611. The area between this home and the proposed substation is comprised of re-growth dense coniferous and deciduous forest. No direct effects to this home or other nearby residences are anticipated.

Mine Substation

The nearest residence to the proposed Mine substation is located approximately 1.1 miles to the north between Big Sucker and Little Sucker Lakes. The area between this home and the proposed substation is mostly forested land. To the south, the closest residences are approximately 1.6 miles away. No direct effects to this home or other nearby residences are anticipated.

Mitigation

Impacts from the construction of the proposed substations are not anticipated, therefore no mitigation has been proposed.

6.6.1.2 Property Values

Impacts

The Plant substation is more than one half mile away from the nearest residence. The nearest home to the Mine substation is over one mile away between Little Sucker and Big Sucker Lakes. It is unlikely that the proposed substation locations on Essar Steel Minnesota property (an industrial area) would result in impacts to property values to existing residences.

Mitigation

No impacts are anticipated, therefore no mitigation has been proposed.

6.6.1.3 Aesthetics

Impacts

Plant Substation

The proposed substation would be located within an industrial facility surrounded by primarily forested land. Land clearing would take place within the substation footprint and 20 feet outside of the substation fence. An access road would also be cleared. The proposed substation would likely be visible from CSAH 58 and Hilltop Road.

Mine Substation

The proposed Mine substation would be located within the Essar Steel facility property. Access to the substation would be from haul roads within the mine, which is not open to the public. The proposed substation is over one mile away from the nearest residence and would not be visible or create an intrusion on the already altered landscape.

Mitigation

The Applicants have indicated that reclamation of the substation sites would occur after construction completion. This would include removing and disposing of debris, dismantling temporary facilities, using appropriate erosion control measures, and reseeding disturbed areas with vegetation similar to what was removed. Where appropriate, Minnesota Power would incorporate methods to visually screen the final site (Route Permit Application, 2009 (pg. 4-10)).

6.6.1.4 Noise

Impacts

Construction of the proposed substation would generate noise for a temporary period of time. It is likely that the construction noise would not be distinguishable from the noise level generated by the Essar Steel Minnesota facility at full operation.

Audible noise may be generated by the operation of the substation equipment. The main source of noise would be generated by the transformers. Whenever a transformer is energized, it can produce an audible noise, which is nearly constant with the exception of a slight variation associated with the operation of the cooling fans or pumps.

> Potential noise generated by the transformers would blend into the other background noise taking place at the Essar Steel Minnesota facility.

The proposed substations would be located on Essar Steel Minnesota property where taconite mining and steel producing operations would take place. The Study Area is rural and sparsely populated with the primary land uses being forest and industrial. Potential noise generated by the transformers would blend into the other background noise taking place at the Essar Steel Minnesota facility and is not expected to be audible beyond the fence line for each substation. The nearest residence is over one-half mile away and would not be impacted by substation noise. No impacts from noise generation by the proposed substation are anticipated.

Mitigation

No impacts from noise generation are anticipated, therefore no mitigation has been proposed.

6.6.1.5 Interference

Impacts

There are no impacts to omidirectional or unidirectional signals anticipated from the construction and operation of the proposed substations.

Mitigation

No impacts are anticipated, therefore no mitigation has been proposed for the substations.

6.6.1.6 Public Health and Safety

Impacts

No impacts to public health and safety are anticipated from the proposed substations. The public would not have access to the substations, which would be fenced with a locked gate. Due to the distances of the nearest residences (over one half mile) and that the proposed substations would be located entirely on Essar Steel property, electric magnetic fields are not anticipated to be a problem to nearby structures or people.

Mitigation

Public access would be prohibited with use of fencing and no trespassing and warning signs. No additional mitigation has been proposed.

6.6.2 Land-based Economics

The Plant substation and Mine substation would be constructed on Essar Steel Minnesota property on sites that are currently idle, but are part of future mining operations. The following sections provide descriptions where potential impacts to land-based economics subcategories may occur due to the Proposed Project. These subcategories were identified in the FSDD and background information and current conditions described in chapter 5 of this DEIS.

6.6.2.1 Agriculture

Impacts

Minnesota Statutes, section 216E.10, subd. 3(b) requires the Applicants to notify the Commissioner of the Department of Agriculture if the proposed project would impacts cultivated agricultural land. This statute also allows the Department of Agriculture to participate in the permitting process for the Proposed Project by advising the Commission on whether adverse impacts would occur and how those could be mitigated.

Mitigation

The Applicants contacted the Commissioner of the Department of Agriculture in a letter dated December 22, 2008 regarding the Proposed Project. The Department of Agriculture has not yet responded or indicated whether an agricultural impacts mitigation plan will be required by the Applicants for potential impacts.

6.6.2.2 Mining and Forestry

Impacts

Plant Substation

Approximately 4.5 acres of mixed re-growth forest would be permanently cleared for construction of the Plant substation. This substation site has been previously disturbed by past logging activity. The Plant substation is necessary for taconite mining and processing operations at the Essar Steel facility. There would be no negative impacts on mining. The loss of mixed re-growth forest on the Essar Steel Minnesota property is not expected to have an effect on land-based economics in the area.

Mine Substation

Approximately 1.4 acres of young aspen forest would be permanently cleared for construction of the Mine substation. This substation site has been previously disturbed by past mining activity. The Mine substation is necessary for taconite mining and processing operations at the Essar Steel facility. There would be no negative impacts on mining. The loss of young aspen forest on the Essar Steel Minnesota property is not expected to have an effect on land-based economics in the area.

Mitigation

No impacts on mining and forestry are anticipated from the construction of the Plant substation. Mitigation has not been proposed.

6.6.2.3 Zoning and Land Use Compatibility

Impacts

The proposed substations would be located within a mining district and industrial zone (Figure 13). The existing and future adjacent land uses are primarily mining related. Therefore the proposed substations would be compatible with existing zoning for the area, as well as adjacent land use.

Mitigation

There are no impacts anticipated, therefore no mitigation has been proposed.

6.6.2.4 Transportation and Public Services

Impacts

Plant Substation

The Plant substation is necessary for operation of proposed Route 1/1A, Route 3/3A, and Route 4/4A. The Plant substation would be accessed via the north side of CSAH 58. During construction of this proposed substation, there may be temporary periods of increased traffic near the construction site and possible road closure for short periods of time. Once the proposed substation is fully constructed and operational, there would not be impacts to nearby roadways.

Mine Substation

The Mine Substation is necessary for operation of proposed Route 2/2A, Route 3/3A and Route 4/4A. The Mine substation would be accessed by mine pit haul roads on private property. Construction of this proposed substation would not impact local roadways or infrastructure.

Mitigation

The Applicants would work with state and local governments on a construction schedule for construction of the Plant substation in order to minimize transportation impacts. No additional mitigation has been proposed for construction or operation of the Mine substation.

6.6.2.5 Recreation

Impacts

There are no recreational trails near the proposed substation locations (Figure 15). The proposed substation sites are currently owned or would be acquired by Essar Steel Minnesota and closed to public access. Essar Steel Minnesota plans to acquire the land for future mining activity related to the Essar Steel project whether or not the Proposed Project is permitted.

Mitigation

There are no significant impacts to recreation anticipated, and therefore, mitigation has not been proposed.

6.6.2.6 Archaeological and Historic Resources

Impacts

Plant Substation

The proposed Plant substation would be located north and west of the former Butler pit mining area. The site has been previously disturbed by past mining activity. SHPO records indicate that the nearest identified archaeological site is located more than four miles northwest of the site in forested land beyond the area of past active mining.

There are no historic resources known to exist in the Plant substation area.

Mine Substation

The proposed Mine substation would be located on a stockpile and previously logged area, north and west of past and future open pit mine areas. According to SHPO records obtained for the Study Area, archaeological sites were identified approximately four miles north of the proposed substation site in forested lands beyond the area of past active mining. Impacts to archaeological resources from construction and operation of the proposed substation are not anticipated.

Historic resources have been identified in the cities of Calumet, Marble and Nashwauk, but not near the proposed Plant or Mine substation sites.

Historic resources have been identified in the cities of Calumet, Marble and Nashwauk, but not near the proposed Mine substation site. The Hill Annex Mine historic site is approximately 1.8 miles away and would not be impacted by the proposed substation.

As previously discussed in section 5.4.6, there may be additional archaeological and historic resources in the Study Area that have not yet been identified or recorded by SHPO. Unknown resources have the potential to be impacted by the Proposed Project primarily during the construction phase. The Proposed Project is not anticipated to cause adverse impacts to archaeological and historic resources. Additional information on potential impacts to archaeological and historic resources from the Proposed Project is provided in section 6.1.2.6.

Mitigation

No adverse impacts to identified sites are anticipated. If currently unidentified sites are discovered during construction, the Applicants would coordinate directly with SHPO and would determine the proper measures to minimize or mitigate for impact to the sites.

The Applicants indicated in the Route Permit Application that the potential existence of the Native American burial mounds near Little Sucker Lake needs to be further investigated prior to construction. If burial mounds are discovered, measures to avoid and not disturb the burial mounds would be taken in accordance with Minnesota Statutes, section 307.08.

The Applicants would also integrate into the construction bid documents a training, monitoring and discovery plan should previously unknown cultural resources or human remains be inadvertently encountered during construction. Additional detail on the training, monitoring and discovery plan are provided in 6.1.2.6.

6.6.3 Natural Environment

The following sections provide descriptions where potential impacts to natural environment subcategories may occur due to the Proposed Project. The subcategories identified in the FSDD and described in chapter 5 of this DEIS include air quality, water resources, wetlands, flora and fauna, and rare and unique resources/critical habitat.

6.6.3.1 Air Quality

The Proposed Project has the potential to affect air quality near the substations from leaks of the Greenhouse Gas SF6 at the electrical substations. In addition, there may be limited short term emissions from vehicle exhaust and fugitive dust during construction of the transmission line. The construction activities for the substations would occur primarily on the Essar Steel site. The off-site Blackberry substation is an existing facility.

Sulfur hexafluoride (SF_6) is used at electrical substations to insulate high voltage equipment. While SF_6 is odorless, nontoxic, and nonflammable, it is a strong greenhouse gas with a CO_2 equivalent global warming potential of 23,900 (IPCC, 1996). Approximately 0.4 percent of the CO_2 equivalent greenhouse gas emissions in Minnesota were SF_6 electrical generation emissions. Of the statewide emissions, the three electrical substations would be a minor contribution. Newer electrical equipment has lower SF_6 emissions than older equipment. The overall impact on greenhouse gas emissions from the Proposed Project would be very small. The Applicants would recover and recycle SF_6 during maintenance work.

Construction and operation of the proposed substations is not expected to significantly impact air quality, and therefore, no mitigation has been proposed.

6.6.3.2 Water Resources

The proposed substations are not located near water resources. No impacts to these resources are anticipated, and no mitigation has been proposed.

6.6.3.3 Wetlands

The proposed substations are not located near wetlands. No impacts to wetlands are anticipated, and no mitigation has been proposed.

6.6.3.4 Flora and Fauna

Impacts

Plant Substation

The proposed Plant substation site was previously altered on numerous occasions in the past and is located adjacent to existing and future mining operations. The site is surrounded by previously logged forest, young re-growth forest, shrubland, and mine spoils. Approximately 4.5 acres would be cleared and graded for construction of the substation. This would result in loss of potential wildlife habitat. The Plant substation site is relatively small in relation to adjacent mining operations and surrounding potential habitat areas. The impact of this permanent loss of vegetation/habitat would be minimal.

Mine Substation

The proposed Mine substation site is located on a stockpile that has revegetated, and also includes past logging areas that have re-grown with early successional tree species. The proposed Mine substation site would be located adjacent to the taconite plant crusher and concentrator facilities for the Essar Steel facility. It would be surrounded by access roads on all sides, which would disconnect it from potential adjacent wildlife habitat. Approximately 1.4 acres of previously altered, but revegetated land would be cleared for construction of the proposed substation. This would not result in a significant impact to wildlife habitat or flora and fauna in the Study Area.

Mitigation

Restoration activities have been proposed for substation sites, which include removal of temporary structures and reseeding areas disturbed by construction with vegetation similar to that which was removed. These restoration activities would further minimize impact to the site. Impacts from construction of the proposed substation are anticipated to be minimal, therefore no specific mitigation measures have been proposed.

6.6.3.5 Rare and Unique Natural Resources/Critical Habitat

Impacts

There are no identified threatened or endangered species or plant communities located within the proposed substation sites. Several state-listed plant species: Botrychium oneidense (state endangered), Botrychium pallidum (state special concern), B. simplex (state special concern), B. minangense (state special concern), and B. rugulosum (state threatened), are known to occur on nearby mining stockpiles on lands similar in character to the proposed substation site. This indicates that one of these state-listed plant species has the potential to occur within the proposed substation footprint.

The proposed substation sites do not have high quality habitat. The site locations are also in close proximity to past and future mining and taconite processing, existing roadways, and other infrastructure. Habitat impacts due to fragmentation from construction of the proposed substation are not anticipated.

Mitigation

The Applicants have indicated in the Route Permit Application that they would continue to work with the MNDNR and the USFWS regarding threatened and endangered species and their potential presence within the Proposed Project.

The Applicants would avoid impacts to threatened, endangered, and sensitive species and communities to the extent practicable. If impacts cannot be avoided, the Applicants would work closely with regulatory agencies to identify appropriate measures to minimize impacts and compensate for impacts as necessary.

7.0 Summary of Unavoidable Impacts

The Proposed Project has the potential to create environmental impacts and consume resources within Itasca County. The specific detailed analysis of potential environmental impacts from the Proposed Project is provided in chapter 6. An EIS for a proposed action includes a summation of the significant environmental impacts and resource consumption determined during the environmental review analysis. This chapter provides a summary of the significant and unavoidable adverse impacts and the irreversible or irretrievable commitment of resources for the Proposed Project.

7.1 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Typically, unavoidable adverse impacts from HVTL projects result from physical impacts to the land associated with construction of project facilities and from visual impacts on the surrounding landscape. The Proposed Project would have both temporary and long-term significant impacts on forested lands, wetlands, wildlife habitat and aesthetic factors. Mitigation measures for the impacts identified are described in chapter 6 of this Draft EIS and would be implemented to minimize unavoidable adverse environmental impacts.

Forested Lands

Construction of the new HVTLs for the Proposed Project would include the establishment of a 130 foot wide ROW. In the event that a Route Permit is granted for the Proposed Project, the ROW would be cleared of forested vegetation for the entire length of the HVTL alignment for each of the selected routes. Timber harvested during ROW clearing and construction would be made available to landowners for firewood, saw logs, and other uses. Upon completion of construction a new low lying vegetation community would be established within the ROW of the HVTL. The previously forested lands would be lost from timber production. The acres of forested lands that would be impacted are discussed in chapter 6 of this Draft EIS. The amount of land lost from timber production as a result of the Proposed Project would be small compared to the total acres of forested lands within the Study Area and Itasca County.

Wetlands

There are a variety of wetland resources within the Study Area of the Proposed Project. In the event that a Route Permit is issued for the Proposed Project, the proposed HVTLs would cross wetlands regardless of the final routes selected. In some instances it would be possible to avoid wetland impacts by spanning the HVTL between two structures located outside the wetland. However, for larger wetland basins it would not be possible to span the entire basin, which would result in structures placed within the wetlands. While the total area of each HVTL structure is small, wetland impacts would require a permit from the proper regulatory authorities, including the development of acceptable mitigation plans. Temporary impacts to wetland vegetation may occur during construction, as the large construction vehicles may damage or destroy wetland vegetation. Wetland vegetation disturbed during construction would be required to be restored to pre-construction conditions. Winter construction within wetlands would also reduce wetland impacts.

Additional wetland impacts from the Proposed Project would be associated with vegetation clearing during ROW establishment. Trees within forested wetland would be cleared within the ROW to allow for constriction of the proposed HVTLs. Similar to forest impacts described above; a new low lying wetland vegetation community would be established within the ROW. The forested wetland communities would be lost within the ROW, and this may be considered a change of wetland type and a wetland impact that requires mitigation.

Wildlife Habitat

The majority of the land within the Study Area and within the proposed HVTL routes contains a forested land cover. As described under forest impacts, forested lands would be cleared during ROW establishment and HVTL construction. Upon completion of construction, a new low lying vegetation community would be established within the ROW. The loss of forested lands would alter wildlife habitat within the ROW. The habitat would not be completely lost, but instead would shift to benefit wildlife species that favor grassland habitat as opposed to forested habitats. The total amount of forested land that would be impacted by the Proposed Project is small compared to the amount of forest in the Study Area and within Itasca County. Additional wildlife impacts may occur in the form of direct mortality to small or slow moving species that can not avoid the large mechanized equipment used for ROW clearing and HVTL construction. These impacts would be to local individuals in the Study Area and would not result in population level impacts.

Aesthetics

The construction of an HVTL project involves tall, manmade structures that can be seen from varying distances depending on the surrounding landscape and topography of an area. The presence of an HVTL can detract from the visual landscape and character of an area. The Applicants have proposed to use H-frame wooden structures to construct the new HVTLs. The H-frame wooden structures would range from 60 to 90 feet in height. In the event that single steel pole structures are required for certain portions of an HVTL, the poles would range from 90 to 110 feet in height. Wooden H-frame structures are considered less intrusive in a rural landscape as compared to the more industrial looking single steel pole structures.

The HVTLs would be visible by residences that are in close proximity to selected routes. The total number of residences that would be visually impacted by the HVTLs would depend on the selected routes, local topography and vegetative screening in the area. The new HVTLs would also be visible at trail crossings and water body crossings. Pole spacing would also impact the visual effects of the proposed HVTL, with wider spacing resulting in the construction of less poles.

7.2 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

There are commitments of resources associated with the Proposed Project that are irreversible and irretrievable, but those that do exist are primarily related to construction. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the proposed action. Construction resources that would be used include aggregate resources, concrete, steel, and hydrocarbon fuel. These resources would be used to construct the Proposed Project. During construction, vehicles would be traveling to and from the site utilizing hydrocarbon fuels.

8.0 Required Permits and Approvals

Various permits are required for the completion of HVTL projects. This section summarizes the permits and approvals that may be required for the Proposed Project.

Table 8-1: Potentially Required Permits and Approvals

Agency	Permit/Approval Required
FEDERAL	
Federal Aviation Administration	• Notice of Proposed Construction or Alteration Form 7460
U.S. Army Corps of Engineers	• Section 404 Permit
STATE OF MINNESOTA	
Minnesota State Historic Preservation Office	• Culture and Historic Resources Review
Minnesota Department of Transportation	• Utility Permit • Highway Access Permit • Oversize/Overweight Permit
Minnesota Department of Natural Resources	• Pubic Water Works • License to Cross Public Lands and Waters (Division of Lands and Minerals) • Endangered Species Consultation (Ecological Services)
Minnesota Pollution Control Agency	• NPDES Construction Storm Water Permit • Section 401 Water Quality Certification
Minnesota Public Utilities Commission	• Route Permit
Department of Agriculture	• Noxious Weed Management Plan
LOCAL PERMITS	
County, Township, City	• Road Crossing/Right-of-Way Permits • Driveway Access Permit • Overwidth/Overweight Loads Permit • Utility Permit • Public Lands Permits • Building Permits
Itasca Soil and Water Conservation District, City	• Wetland Conservation Act Approval

8.1 FEDERAL

Federal Aviation Administration

Form 7460: Proposed Construction or Alteration Form
The 7460 Proposed Construction or Alteration Form is required by the Federal Aviation Administration. The FAA examines air safety and efficient use of navigable airspace based on information provided per the form.

U.S. Army Corps of Engineers

Section 404 Permit
A Section 404 permit is required by the USACE in order to discharge dredged or fill material into U.S. waters under the Clean Water Act. This permit is applied for after the route of the transmission line is determined. Development of an acceptable mitigation plan to offset impacts to wetlands would be required under this permit.

8.2 STATE OF MINNESOTA

Minnesota State Historic Preservation Office

Culture and Historic Resources Review
Consultation with the Minnesota State Historic Preservation Office (SHPO) regarding known historical and archaeological resources and possible impacts of the Proposed Project has been initiated by the Applicants.

Minnesota Department of Transportation

Utility Permit
A utility permit is necessary for construction, placement, or maintenance of utility lines that are located adjacent or across the highway ROW. These permits are acquired after completion of HVTL designs.

Highway Access Permit
Permits of this nature are required in an effort to maintain the effective flow of traffic while accommodating access needs of land development projects. This permit would be required for the Proposed Project to deliver construction materials to the Project Area.

Oversize/Overweight Permit
Oversize/overweight permits may be required to move oversized and heavy loads on state highways. There are restrictions on travel as to not impede travel at high traffic times or during seasons of the year when road damage is more likely to occur from heavy loads.

Minnesota Department of Natural Resources

Pubic Waters Work
MNDNR Public Waters Work Permits apply to all public waters identified in the Public Waters Inventory. If a proposed project might affect the course, current, or cross-section of a listed water body, a Public Waters Work Permit may be required by the MNDNR. According to Minnesota Statutes 103G.245, subdivision 1 (except as provided in subdivisions 2, 11, and 12), any state, political subdivision of the state, public or private corporation or person must have a Public Waters Work Permit to:

1. Construct, reconstruct, remove, abandon, transfer ownership of, or make any change in a reservoir, dam, or waterway obstruction on public waters; or
2. Change or diminish the course, current, or cross section of public waters that is entirely or partially within the state; changes including filling, excavating, or placing of materials in or on the beds of public waters.

License to Cross Public Lands and Waters – Division of Lands and Minerals
A license from the MNDNR is required to install a utility over, under or across any state land or public water, under Minnesota Statue 84.415. A utility includes telephone, fiber optic, electrical or other lines, cables or conduits, as well as pipelines or mains for gases, liquids, or solids in suspension. In the license application, the land alignment and water crossing sites must be identified including where the utility would be installed. The utility crossing rules require that the route design avoid impacts to natural features to the maximum extent possible, including items such as vegetation, steep slopes, riparian areas or sensitive lands (i.e., designated scenic and natural areas). The utility crossing rules state that existing road or bridge crossing over public waters should be utilized for new utility crossing locations whenever possible. The Applicants are coordinating with the MNDNR for licensing and public waters crossing associated with the Proposed Project.

Endangered Species Consultation
The Minnesota Endangered Species Program is enforced by the MNDNR, which uses Minnesota Rules 6134 to protect and regulate endangered and threatened species, as well as species of concern in the state. The rules prohibit taking an endangered or threatened species without a permit. Taking permits may be issued for reasons such as education, enhancing propagation of the species, and preventing injury to people and property. Species of concern are not specifically protected by Minnesota Rules but are monitored and managed by the MNDNR.

Minnesota Pollution Control Agency

NPDES Construction Storm Water Permit
The regulation of storm water is part of the National Pollutant Discharge Elimination System (NPDES) permit program. The MPCA holds permitting authority for Minnesota's NPDES program. The MPCA requires the acquisition of a NPDES Storm Water Permit for construction projects that disturb more than one acre of surface land. The permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) incorporating Best Management Practices (BMPs) to minimize pollution discharged during construction.

Section 401 Water Quality Certification
In accordance with the federal Clean Water Act a state Section 401 water quality certification must be obtained in order to receive federal permits for activities that may result in discharge of water into navigable waters of the U.S. The Section 401 permit must be acquired to ensure that the project will comply with state water quality standards. The Applicants will apply if a Section 404 permit is required on a federal level.

Minnesota Public Utilities Commission

Route Permit
According to Minnesota Statutes 216E.03, subdivision 2, a Route Permit from the Commission is required to construct a HVTL and may only be constructed along the route approved by the Commission. A HVTL is defined as having the capability of transmitting 100 kV or more. The Proposed Project is a 230 kV line thus, a Route Permit is required. HVTLs cannot be constructed until a Route Permit is issued by the Commission.

Department of Agriculture

Noxious Weed Management Plan
The Minnesota Department of Agriculture is responsible to eradicate, control, and abate nuisance plant species. The program is administered by the local county agricultural inspector. The Applicants would be required to control noxious weeds that may be present within the ROW after the construction of the Proposed Project.

8.3 LOCAL

County, Township, City

Road Crossing/Right-of-Way Permit
These permits may be required to cross or occupy the ROW of a road belonging to the county, township, or city.

Driveway Access Permit
Driveway access permits may be required in order to construct access roads off of county, township, or city roads.

Overwidth/Overweight Load Permit
Overwidth/overweight permits may be required in order to move loads that are wide or heavy on the county, township, or city roads.

Utility Permit
A utility permit from Itasca County is required to install, replace and maintain utilities on County ROW. After being granted, the permit holder must follow all requirements established by the County Highway Engineer. The utility permit application must be complete, submitted, and approved before initiation of construction of the Proposed Project.

Building Permits
These permits may be required for substation modifications and new construction. The proposed substations on the Essar Steel property were included in the original building permit from the city of Nashwauk for the Essar Steel project.

Public Land Permits
Permits may be required to occupy parklands, watershed districts, or other public properties owned by the county, township, or city.

Itasca Soil and Water Conservation District, City of Nashwauk

Wetland Conservation Act Approval
WCA is a way to preserve the wetlands in Minnesota and the benefits that they provide. WCA is implemented locally by cities, counties, watershed management organizations, soil and water conservation districts, and townships. For the Proposed Project, the Itasca Soil and Water Conservation District and the city of Nashwauk administer WCA which may require a permit under Minnesota Rules 8420.

8.4 EXEMPTIONS

Correspondence between the Applicants and several governing agencies has indicated the exemptions provided below.

Minnesota Public Utilities Commission

Certificate of Need
The Minnesota Public Utilities Commission regulates the construction of transmission lines in Minnesota and is responsible for determining if there is a need for a new transmission line by requiring the application for a Certificate of Need. The Proposed Project is exempt from the application requirement as the new transmission lines are directly associated with the plant and primarily to distribute electricity to serve the demand of a single customer at a single location.

Natural Resource Conservation Service (NRCS)

Farmland Protection Policy Act
The intention of the Farmland Protection Act is to minimize the loss of agricultural land uses. The NRCS has informed the Applicants that the Proposed Project is exempt from the Federal Farmland Protection Policy Act as there are no federal sponsoring agencies involved in the project.

Minnesota Department of Transportation – Office of Aeronautics

The Proposed Project has been found to have no substantial adverse effects on safe and efficient use of navigable airspace.

9.0 References

Census of Agriculture-Itasca County. Website: http://www.agcensus.usda.gov. Accessed: December 11, 2009.

City of Nashwauk. 2009. Public Services. Website: http://www.nashwauk.govoffice.com/. Accessed: December 11, 2009.

City of Nashwauk. 2009. Zoning and permitting for the Essar Steel Project. Telephone conversation on December 15, 2009 with city clerk.

City of Taconite. 2009. Public Services. Website: http://www.lakesnwoods.com/Taconite.htm Accessed: December 11, 2009.

Cowardin, et al. 1979. *Classification of Wetlands and Deepwater habitats of the United States*. U.S. Fish and Wildlife Service. December 1979.

Cyberhomes. 2009. Website: http://www.cyberhomes.com/neighborhoods-itascacounty-mn/547066.aspx. Accessed: December 9, 2009.

Electric Power Research Institute (EPRI). 2001. Technical Brief Electromagnetic Interference With Implanted Medical Devices. December 2001.

Elliott, Peter and D. Wadley. 2002. *The Impact of Transmission Lines on Property Values: Coming to Terms with Stigma*. Property Management (2002) 20 (2), pp. 137-152.

Fairview. 2009. Public Services. Website: http://www.range.fairview.org/clinics/nashwauk/. Accessed: December 11, 2009.

Federal Communications Commission. 2009. The Digital TV Transition: Low Power Television Stations. http://www.dtv.gov/lptv.html.Accessed January 21, 2010.

Grand Itasca Clinic and Hospital. 2009. Public Services. Website: http://www.granditasca.org/. Accessed: December 11, 2009.

Gronhovd, Amanda, Grant Goltz, and Dr. Christy A. Hohman Caine. 2009. *Phase I and Phase II Cultural Resources Investigations for the Proposed Keetac Project Near Keewatin, St. Louis and Itasca Counties, Minnesota*. 10,000 Lakes Archaeology and Soils Consulting. May 2009.

Hamilton, Stanley W. and Gregory M. Schwann. 1995. *Do High Voltage Transmission Lines Affect Property Value?*. Land Economies, Vol. 71, No. 4, pp. 436-444. University of Wisconsin Press. November 1995.

HDR Engineering, Inc. 2009. Nashwauk PUC and Minnesota Power Electric Power Delivery Project Route Permit Application. Docket # E280/TL-09-512. June 2009.

High Prairie Wind Farm II, LLC. 2006. Environmental Assessment-High Prairie HVTL and Substations. December 4, 2006. Available: http://energyfacilities.puc.state.mn.us/project.html?Id=18874

Itasca County Board of Realtors. 2009. Real Estate Sales Statistics – Year to Date Vol: 12. December 9, 2009.

Itasca Economic Development (Itasca ED). 2008. *Annual Perspective 2008 Itasca Economic Report*. Website: www.itascadv.org.

Kroll, Cynthia, PhD and Thomas Priestley, PhD. 1992. *The Effects of Overhead Transmission Lines on Property Values*. Prepared for the Edison Electric Institute Siting and Environmental Planning Task Force. July 1992.

Mesabi Trail. 2009. Website: http://www.mesabitrail.com/. Accessed December 2, 2009.

Minnesota Department of Commerce (DOC). 2009. Brookings County – Hampton 345 kV Transmission Line Project, Draft Environmental Impact Statement. October, 2009.

Minnesota Department of Education (MDE). 2009. Academic Excellence School Report Card: Nashwauk-Keewatin School District, 2008-09 School Year. Website: http://education.state.mn.us/ReportCard2005/demographics.do?SCHOOL_NUM=000&DISTRICT_NUM=0319&DISTRICT_TYPE=01.

Minnesota Department of Employment and Economic Development (DEED). 2007. Labor Statistics Data Tools. Positively Minnesota. Website: http://www.deed.state.mn.us/lmi/tools/htm.

Minnesota Department of Natural (MNDNR). 2007. Minnesota Steel, LLC. Project Final Environmental Impact Statement. June 2007.

Minnesota Department of Natural Resources (MNDNR). 2009. Email correspondence and phone conversation with Aaron VandeLinde. December 22, 2009.

Minnesota Department of Natural Resources (MNDNR). 2009. Hill Annex State Park. Website: http://www.dnr.state.mn.us/state_parks/hill_annex_mine/index.html. Accessed: December 1, 2009.

Minnesota Department of Natural Resources (MNDNR). 2009. Nashwauk Uplands Subsection. Website: http://www.dnr.state.mn.us/ecs/212Lc/index.html. Accessed: December 1, 2009.

Minnesota Department of Natural Resources (MNDNR). 2009. Snowmobile Maps 18 and 23. Website: http://www.dnr.state.mn.us/snowmobiling/maps.html. Accessed December 1, 2009.

Minnesota Department of Natural Resources (MNDNR). 2009. St. Louis Moraines Subsection. Website: http://www.dnr.state.mn.us/ecs/212Nb/index.html. Accessed: December 1, 2009.

Minnesota Department of Natural Resources (MNDNR). 2009. Taconite State Trail. Website: http://www.dnr.state.mn.us/state_trails/taconite/index.html. Accessed: December 1, 2009.

Minnesota Department of Natural Resources (MNDNR). 2010. Specied Profile: Tubercled Rein-orchid. http://www.dnr.state.mn.us/rsg/profile.htmlAccessed January 14, 2010.

Minnesota Department of Transportation (MNDOT). 2005. Website: http://www.dot.state.mn.us/traffic/data/maps/trafficvolume/2005/counties/itasca1.pdf Traffic Volumes. Accessed: December 8, 2009.

Minnesota Department of Transportation (MNDOT). 2006. Website: http://www.dot.state.mn.us/traffic/data/maps/trunkhighway/2006/counties/itasca1.pdf Traffic Volumes. Accessed: December 8, 2009.

Minnesota Department of Transportation (MNDOT). 2008. Website: http://www.dot.state.mn.us/aero/avoffice/pdf/PublicAccessAirports.pdf Airport Information. Accessed: December 8, 2009.

Minnesota Department of Transportation (MNDOT). 2009. Website : http://www.dot.state.mn.us/ofrw/maps/MNRailVolSpeed.pdf. Train Volumes. Accessed: December 8, 2009.

Minnesota Department of Transportation (MNDOT). 2009. Website : http://www.dot.state.mn.us/ofrw/frieghtData.html. Train Information. Accessed: December 8, 2009.

Minnesota Emergency Medical Services Regulatory Board. 2009. Website : http://www.emsrb.state.mn.us/docs/Ambulance_Service_Directory_March_2009-2.pdf Ambulance Service. Accessed: December 11, 2009.

Minnesota Pollution Control Agency (MPCA). 2009. *A Guide to Noise Control in Minnesota. Revised*. March 2009.

Minnesota Statutes. 2010. Control or Eradication of Noxious Weeds. https://www.revisor.mn.gov/statutes/?id=18.78 Accessed January 21, 2010.

Mitteness, Cheryl MBA and Steve Mooney, PhD. 1998. *Power Line Perceptions: Their Impact on Value and Market Time.* Presentation for ARES Annual Meeting. St. Cloud State University. 1998.

Nashwauk-Keewatin Schools. 2009. School District Information. Website: http://nashwauk.schoolfusion.us/. Accessed: December 1, 2009.

National Institute of Environmental Health Sciences. 2002. *EMF: Electric and Magnetic Fields Associated with the Use of Electric Power Questions and Answers*. June 2002.

Petersen, Charlie. 2009. Essar Steel 230 kV Transmission Line Project Advisory Task Force Report (PUC Docket No. E-280/TL-09-512). Minnesota Department of Commerce. October 20, 2009.

Pitts, Jennifer and Thomas O. Jackson, PhD, MAI. 2007. *Power Lines and Property Values Revisited*. The Appraisal Journal, pp. 323-325. Fall 2007.

Public Service Commission of Wisconsin. 2001. PSC Overview Series EMF – Electric & Magnetic Fields. June 2001.

Shaw and Fredine. 1971. Wetlands of the United States. U.S. Fish and Wildlife Service. Circular 39.

Smith, Doug. 2009. Legacy Deal Will Protect Land Up North. Star Tribune. June 4, 2009.

Syrjamaki, John. 1940. *Mesabi Communities: A Study of Their Development, Vol. 1* Dissertation; Chapter IV: The People of the Range. Website: http://minnesotahumanities.org/Resources/The%20People%20of%20the%20Range.pdf. Accessed December 3, 2009.

U.S. Census Bureau. 2000. Poverty level and race characteristics data for Study Area, Itasca County, and state of Minnesota.

U.S. Department of Agriculture (USDA), Farm Service Agency. 2009. Website: http://content.fsa.usda.gov/crpstorpt/rmepeii_r1/MN.HTM CRP Search. Accessed: December 9, 2009.

U.S. Department of Agriculture (USDA). 2007. Census of Agriculture-Itasca County. Website: http://www.agcensus.usda.gov. Accessed: December 11, 2009.

U.S. Department of Agriculture (USDA). 2008. The United States National Arboretum – Invasive Plants. http://www.usna.usda.gov/Gardens/invasives.html Accessed January 22, 2010.

U.S. Environmental Protection Agency. 2010. National Ambient Air Quality Standards (NAAQS) http://www.epa.gov/air/criteria.html. Accessed: January 21, 2010.

Wenck Associates, Inc. 2009. *Noble Flat Hill Windpark I Project Final EIS*. Minnesota Department of Commerce. October 2009.