

7.0 Cumulative and Other Impacts

7.1 Cumulative Impacts Analysis

In addition to analyzing the direct and indirect impacts of the alternatives—which include the proposed Project routes and variations presented in Chapter 5 and Chapter 6—the federal environmental review process requires consideration of the cumulative environmental impacts of multiple actions within an area. Cumulative impacts result from the “incremental impact of the [current] action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 Code of Federal Regulations (CFR) 1508.7).

Similarly, Minnesota’s environmental review rules require the evaluation of “cumulative potential effects” which is defined as “the effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects” (Minnesota Rules, part 4410.0200, subpart 11a).

The cumulative impacts analysis, as provided in Section 7.2 and Section 7.3, consists of two parts: identification of other actions that are considered along with the proposed Project in analyzing cumulative impacts, and a description (quantitative or qualitative) of those potential cumulative impacts.

7.2 Other Actions Considered for Potential Cumulative Impacts

The potential for cumulative impacts depends, in part, on temporal factors within the environment. The temporal boundaries for cumulative impacts include past actions, ongoing actions, and reasonably foreseeable future actions that cover the construction period of the proposed Project (beginning in fall 2017) and the beginning of operations (summer 2020). The temporal period would also carry through the life of the proposed Project for operational impacts, such as aesthetic or electric and magnetic fields (EMF) effects. Accordingly, this section identifies past, present, and reasonably foreseeable future actions considered in the cumulative impacts analysis.

7.2.1 Past Actions

Past actions are those actions and their associated impacts that occurred within or influenced the geographic region of influence (ROI) of each resource and have shaped the current affected environment of the proposed Project area. For the purposes of this Environmental Impact Statement (EIS), actions that have occurred in the past and their associated impacts are now part of the existing environment and are included in the affected environment described in Chapter 5.

7.2.2 Present and Reasonably Foreseeable Future Actions

This section describes reasonably foreseeable projects that are (1) under construction, have permits, or have submitted permit applications, and (2) have the potential to collectively impact resources within the proposed Project’s ROI for the various resources evaluated in Chapter 5 and Chapter 6. The types of projects considered include roadways, railroad lines, industrial facilities, and energy projects such as power plants, transmission lines, and pipelines.

The Minnesota Department of Transportation (MnDOT) Statewide Transportation Improvement Program (STIP) and current amendments and modifications to the STIP identify various transportation projects in the vicinity of the proposed Project for the period of 2015-2018 (MnDOT 2014, reference (191)). Review of the planned projects for MnDOT Districts 1B and District 2A,⁸⁶ which include the proposed Project area, indicates that the planned transportation projects generally consist of routine maintenance activities such as roadway re-surfacing, asphalt surface treatment, bridge repair, asphalt surface treatments, concrete paving, railroad crossings, signage, and pedestrian/bike trail improvements. Based on the STIP, other than the routine maintenance activities, there are no roadway projects presently planned or reasonably foreseeable within the vicinity of the proposed Project, including the areas adjacent to the Applicant’s proposed international border crossing and alternative international border crossings.

The Minnesota Department of Commerce (MN DOC) project database was also reviewed to identify any power plant, transmission line, pipeline, or wind projects currently open or permitted in the vicinity of the proposed Project, as these would also be

⁸⁶ Map available at <http://www.dot.state.mn.us/information/docs/district-map-with-sub-areas.pdf>

reasonably foreseeable projects.⁸⁷ According to this review, one power plant with an associated transmission line and natural gas pipeline (Excelsior Energy's Mesaba Energy project) and one 230 kilovolt (kV) transmission line (Minnesota Power's Nashwauk Project) have been issued permits since 2010 by the Minnesota Public Utilities Commission (MN PUC) but have not yet been constructed. In addition, as part of the route permit process for the proposed Enbridge Sandpiper oil pipeline project, the MN PUC has included one route for consideration that would cross the 200-foot right-of-way (ROW) of this proposed Project (from west to east).⁸⁸ The proposed Enbridge Line 3 project, another oil pipeline, would follow the same route as the proposed Enbridge Sandpiper project from the terminal in Clearbrook, Minnesota to the terminal in Superior, Wisconsin terminal.

In summary, portions of the permitted routes for the Mesaba Energy and Nashwauk transmission line projects are within the Applicant's proposed routes. One of the proposed Enbridge Sandpiper routes and the Enbridge Line 3 route, under consideration by the MN PUC, would cross the alternatives for the proposed Project. Therefore, since these transmission line and pipeline projects are reasonably foreseeable projects that could occur in the vicinity of the proposed Project, they are described below.

7.2.2.1 Excelsior Energy Mesaba Energy Project

On March 12, 2010, the MN PUC issued a large electric power generating plant site permit to Excelsior Energy to construct the Mesaba Energy project in Itasca County (Map 7-1). The Mesaba Energy project was originally proposed as a 1,200 megawatt (MW) (net) coal-feedstock integrated gasification combined cycle power plant. In addition to the site permit, the MN PUC also issued a pipeline permit and a Route Permit for a 345 kV transmission line to connect the proposed power plant into the existing Blackberry Substation.⁸⁹ Construction has not started on the power plant, the natural gas pipeline, or the transmission line.

On May 31, 2012, the MN PUC received a letter from Excelsior Energy stating that it intends to develop only the combined-cycle power block portion of the

project, eliminating the syngas production portions (i.e., gasification island, air separation unit, coal/pet-coke feedstock handling and storage, syngas treating unit, sulfur recovery and tail gas recycle units, etc.) of the project and operating the facility as a natural gas-fueled combined-cycle.⁹⁰ Excelsior Energy also indicated that it plans to construct the coal gasification if and when it becomes feasible to do so from economic and regulatory standpoints (Excelsior Energy 2012, reference (192)). Minnesota Statutes, section 216B.1694, subdivision 3, states that the site and route permits and water appropriation approvals for an innovative energy project must also be deemed valid for a power plant meeting the requirements of paragraph (a) and shall remain valid until the earlier of (i) four years from the date the final required state or federal preconstruction permit is issued or (ii) June 30, 2019.

As shown in Map 7-1, the permitted route for Excelsior Energy's approximately 10-mile long, 345 kV transmission line would be located within the Proposed Blue Route and Proposed Orange Route for about 1.2 miles in the Balsam Variation Area and would be within the entire length (approximately 5.5 miles) of the Proposed Blue Route in the Blackberry Variation Area. The building within the plant site would be located approximately 300 feet from the anticipated alignment of the Proposed Blue/Orange Route in the Balsam Variation Area (Map 7-1).

7.2.2.2 Nashwauk Public Utilities Commission 230 kV Transmission Line

Under an agreement with the Nashwauk Public Utilities Commission, Minnesota Power previously constructed three of four 230 kV transmission lines and two 230 kV substations to supply electric power to an Essar Steel Minnesota project. A fourth transmission line has been permitted by the MN PUC but has not yet been constructed. This potential fourth transmission line would begin at the existing Minnesota Power 230 kV Blackberry Substation (Township 55 North, Range 23 West, Section 19) and continue northeast and parallel two existing Minnesota Power 115 kV transmission lines (the 63 Line and the 62 Line), terminating at the Essar Steel Minnesota project (Map 7-1).

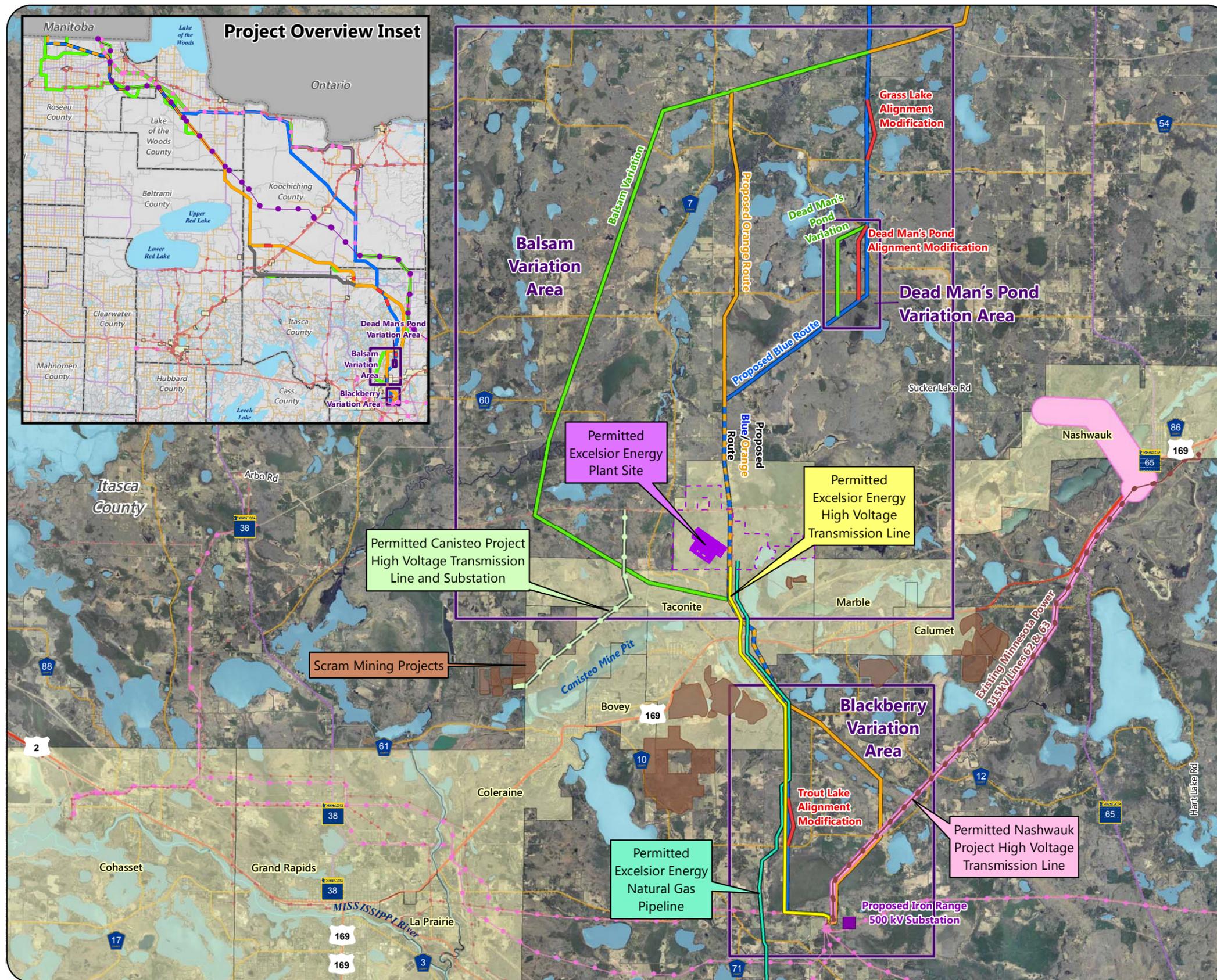
According to the MN PUC route permit (MN PUC 2010, reference (193)), if this proposed fourth transmission line to the Essar Steel Minnesota project is built, the existing 62 line, located west of

⁸⁷ Available at: <http://mn.gov/commerce/energyfacilities/Docket.html> Reviewed on March 25, 2015 for open projects permitted since January 1, 2010

⁸⁸ Available at: <http://mn.gov/commerce/energyfacilities/Docket.html?Id=33599#edocketFiles>

⁸⁹ Available at: [http://mn.gov/commerce/energyfacilities/documents/16573/Combined%20Order%20and%20Permits%20\(signed\).pdf](http://mn.gov/commerce/energyfacilities/documents/16573/Combined%20Order%20and%20Permits%20(signed).pdf)

⁹⁰ Available at: [http://mn.gov/commerce/energyfacilities/documents/16573/Excelsior%20Request%20on%20Natural%20Gas%20Conversion%20\(5-31-12\).pdf](http://mn.gov/commerce/energyfacilities/documents/16573/Excelsior%20Request%20on%20Natural%20Gas%20Conversion%20(5-31-12).pdf)



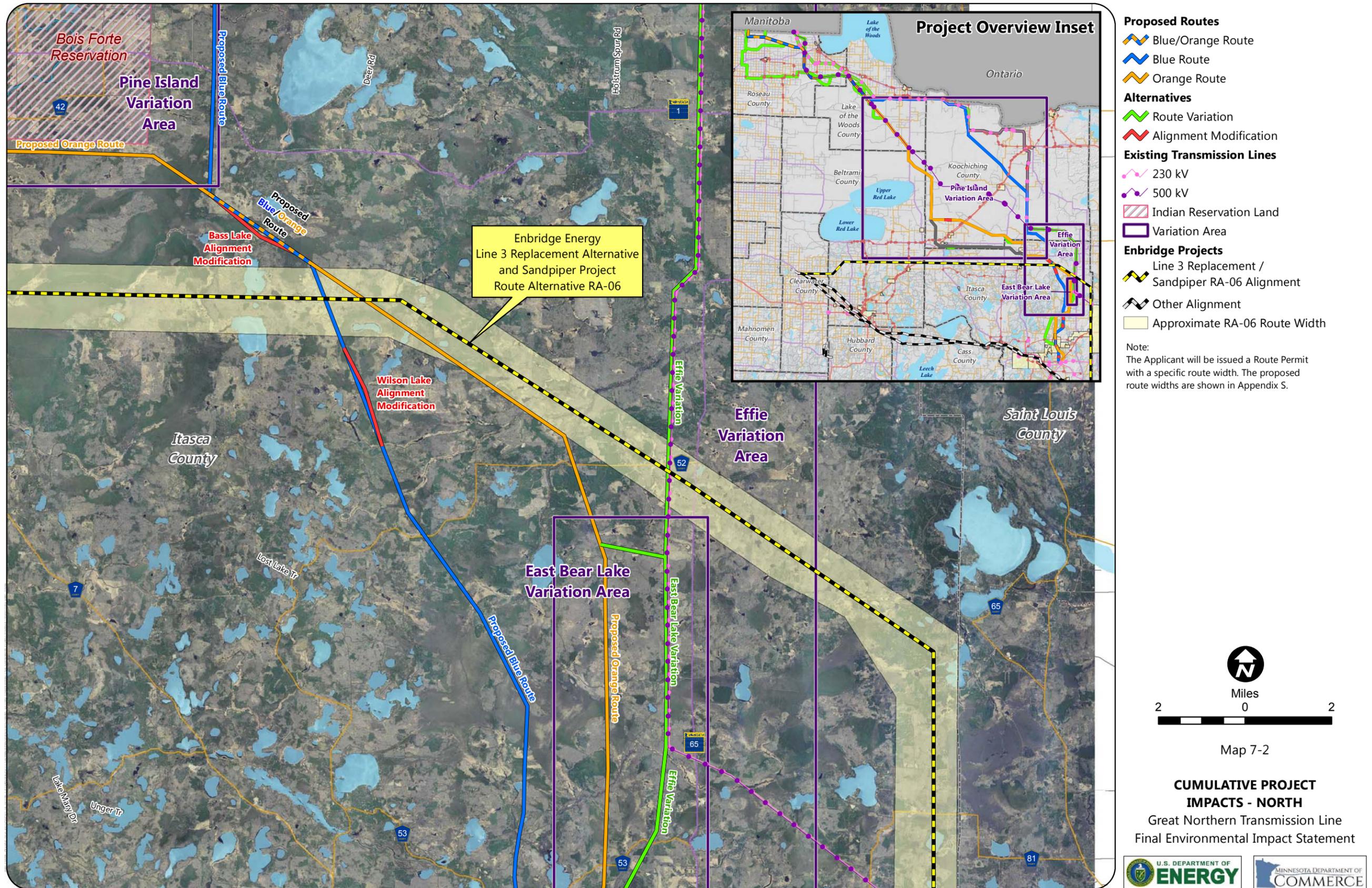
- Proposed Iron Range 500 kV Substation
- Proposed Routes**
- ↔ Blue/Orange Route
- ↔ Blue Route
- ↔ Orange Route
- Alternatives**
- ↔ Route Variation
- ↔ Alignment Modification
- Existing Transmission Lines**
- ↔ 69 or 115 kV
- ↔ 230 kV
- Municipal Boundary
- Variation Area
- Scram Mining Projects
- Excelsior Energy Project**
- ↔ Permitted High Voltage Transmission Line
- ↔ Permitted Natural Gas Pipeline
- ↔ Permitted Plant Site
- Optioned Property
- Nashauk Project**
- ↔ Permitted High Voltage Transmission Line
- Canisteo Project**
- ↔ High Voltage Transmission Line
- Substation Area

Note:
The Applicant will be issued a Route Permit with a specific route width. The proposed route widths are shown in Appendix S.



Map 7-1

CUMULATIVE PROJECT IMPACTS - SOUTH
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the 63 Line, would be dismantled (Map 7-1). The potential fourth 230 kV transmission line would then be constructed within the former 62 Line ROW and would not result in the creation of a new ROW.

The portion of the permitted route for this potential fourth 230 kV transmission line that would parallel the Proposed Orange Route would be two miles in length, and located within the area between the existing Blackberry Substation and near the north end of Little Sand Lake (Map 7-1).

7.2.2.3 Proposed Oil Pipeline Projects

The MN PUC has included numerous potential routes for the proposed Enbridge Sandpiper pipeline project for detailed study as part of the Route Permit process for that project (Minnesota Department of Commerce, reference (194)). One of these route (RA-06) crosses the Proposed Blue Route, Proposed Orange Route, and the Effie Variation in the Effie Variation Area (Map 7-2). As proposed, the Enbridge Line 3 project would also follow the same route as the proposed Enbridge Sandpiper project from the Clearbrook terminal to the Superior terminal; crossing the proposed Project in the same locations as the Enbridge Sandpiper pipeline project. Both of these pipelines would be located underground.

7.2.2.4 Scram Mining

There are also areas where iron ore is currently mined or permits have been issued for new mines in which the ore is extracted from previously developed stockpiles, basins, underground workings, or open pits. The currently active areas of so-called “scram” mining are located near the west side of the Canisteo Pit, approximately four to six miles west of the proposed routes and variations (Map 7-1). The Balsam Variation, which is in the Balsam Variation Area, would cross the permitted Canisteo 115 kV transmission line recently constructed specifically to serve one of these scram mining facilities. **The Balsam Variation would also cross known mineral resources leased from the MnDNR and would potentially encumber the lease.** The anticipated alignment for all other proposed routes and variations are located more than 2,000 feet from existing or proposed scram mining facilities in the area.

7.3 Cumulative Impacts

In addition to temporal factors, the potential for cumulative impacts also depends on spatial factors within the environment, which can vary for the resources evaluated in this EIS. For example, the

geographic area of consideration for cumulative impacts could be limited to the discrete area of disturbance for vegetation resources but also include all vantage points for visual resources. The geographic ROI for cumulative impacts includes the areas in which the proposed Project and reasonably foreseeable future actions—which are identified in Section 7.2.2—directly and indirectly impact resources, and corresponds to the ROIs described in Chapter 5 and Chapter 6.

Cumulative impacts analysis must be conducted within the context of the resources evaluated in this EIS. The magnitude and context of the effect on a resource depends on whether the cumulative effects exceed the capacity of a resource to sustain itself and remain productive (CEQ 1997, reference (195)). If cumulative impacts are expected to exceed these thresholds, they would be considered significant.

The international border crossing alternatives discussed in Section 5.2, Section 5.3, and Section 6.2.1 do not have any reasonably foreseeable future projects located within their ROI that are expected to result in any cumulative impacts.

7.3.1 Human Settlement

This section describes potential cumulative impacts to human settlement resources discussed in Chapter 5 and Chapter 6.

7.3.1.1 Aesthetics

As discussed in Section 5.3.1.1, construction of the proposed Project would result in visual impacts. Short-term aesthetic impacts during construction would be temporary and are expected to be restored to pre-existing conditions upon completion of construction. If any of the reasonably foreseeable projects are constructed at the same time as the proposed Project, these temporary effects would be exacerbated during concurrent construction phases but their short-term nature would mean these adverse impacts are not expected to be significant.

The ROI for long-term impacts on aesthetics is 1,500 feet on either side of the anticipated alignment of the proposed routes and variations and within 1,500 feet from the footprint of the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, permanent and temporary access roads, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. The 1,500 foot ROI for aesthetic resources was identified because the proposed Project is most likely to be visible within this near-foreground distance zone and views of the proposed Project

from aesthetic resources within this distance zone have the greatest potential to result in visual impacts for sensitive viewers.

Although many of the aesthetic impacts of the proposed Project would be short-term during construction, the presence of transmission structures in the landscape and clearing the ROW of trees would result in a long-term change in local aesthetics. In addition, utilities paralleling existing corridors can cumulatively create wide, long areas of visual disturbance. The reasonably foreseeable future transmission line projects listed in 7.2.2 are all in the Balsam and Blackberry variation areas where there are more population centers, infrastructure, and mining activity. The Sandpiper Pipeline RA-06 route, if selected, and the Enbridge Line 3 project would intersect the Proposed Blue/Orange Route, but would be located underground and would cross the 200-foot ROW for the proposed Project. The potential cumulative aesthetic impacts in this area are not expected to be significant because they would only involve paralleling transmission lines for approximately nine miles, and this infrastructure would not be incompatible with existing conditions.

7.3.1.2 Land Use Compatibility

The ROI for land use includes land within 1,500 feet on either side of the anticipated alignment of the proposed routes and variations and within 1,500 feet of the footprint of the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, permanent and temporary access roads, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. This ROI includes the 200-foot ROW and adjacent lands that would be impacted by construction and operation of the proposed Project.

All of the reasonably foreseeable future projects would be required to be developed in compliance with local zoning, floodplain ordinances, and land management plans. As such, considered together, these reasonably foreseeable future projects would be expected to be consistent with planned land uses and no cumulative impacts on land-use compatibility would be expected. The Applicant will need to consult with applicable land management agencies and entities to ensure this compatibility.

7.3.1.3 Cultural Values

The ROI for impacts to cultural values includes the counties crossed by each of the proposed routes and variations. The proposed Project is not expected to have the potential to impact cultural values outside these areas. The cumulative impacts of the reasonably foreseeable future projects listed in

Section 7.2.2 all occur in the general region of the Iron Range, which over the last century has been characterized by communities that developed as a result of the iron and taconite mining industry on the Mesabi Iron Range. The potential impacts from the reasonably foreseeable future projects on these values are not expected to be measurable. Impacts on cultural values in the West, Central, and East Sections due to past projects and the proposed Project are described in Section 5.3.1.

7.3.1.4 Displacement

The ROI for displacement is the 200-foot ROW of the proposed routes and variations since structures within the ROW would need to be removed for construction and operation of the proposed Project. The reasonably foreseeable future transmission line projects would run parallel in the Balsam and Blackberry variation areas. There are no residences in the Proposed Blue Route ROW or the Proposed Orange Route ROW in both the Balsam Variation Area and the Blackberry Variation Area. There are also no residences in the ROW of the Balsam Variation within the Balsam Variation Area. In these locations, all residences are more than 210 feet from any proposed ROW. Because none of the reasonably foreseeable future projects listed in 7.2.2 have residences within any of the potential ROWs, no displacement is anticipated from the proposed Project.

7.3.1.5 Noise

The ROI for noise includes receptors within a 1,500-foot on either side of the anticipated alignment of the proposed routes and variations, **proposed Iron Range** 500 kV Substation site, the 500 kV Series Compensation Station, regeneration stations, permanent and temporary access roads, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. Since construction areas and access roads may be located anywhere within or outside of the ROW and not necessarily only at the proposed centerline, a conservative radius of 1,500 feet from the proposed Project noise sources has been selected to assess the potential impacts of noise from the project on existing sensitive receptors. The attenuation of noise with distance results in a decrease in noise with distance. Typically, a radius of 1,325 to 1,500 feet is used while evaluating potential community noise impacts (Section 5.2.1.2). If all of reasonably foreseeable future projects were constructed at the same time, there would be an expected short-term increase in noise disturbance.

7.3.1.6 Air Quality, Greenhouse Gas Emissions, and Climate Change

The ROI for air quality includes the counties of Roseau, Lake of the Woods, Beltrami, Koochiching, and Itasca because compliance with the national and state air quality standards in the State of Minnesota is assessed at the county level. United States (U.S.) Environmental Protection Agency (EPA) designates all of the counties in the ROI to be in attainment or unclassifiable (to be considered in attainment) for all National Ambient Air Quality Standards (NAAQS) (EPA 2015, reference (2)).

As discussed in Section 5.2.1.3, the construction activities for the proposed Project would generate criteria pollutant emissions; these emissions would be localized to the area of the proposed Project and occur in the short-term time frame of construction. Each of the reasonably foreseeable projects listed in Section 7.2.2 would also involve construction activities with associated short-term emissions. If the large electric power generating plant for the Mesaba Energy project were built, it would result in long-term emissions from operations. None of the reasonably foreseeable future projects individually⁹¹ or cumulatively are expected to contribute to significant air emission impacts because the projects would be in attainment for all NAAQS.

7.3.1.7 Property Values

The ROI for property values is 1,500 feet on either side of the anticipated alignment of the proposed routes and variations and within 1,500 feet the permanent footprint of the other elements of the proposed Project including the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations and permanent access roads). This is the same ROI used in the analysis of the factors (Aesthetics, EMFs, and Agriculture) that can influence property value impacts. The Sandpiper pipeline RA-06 route, if selected, and the Enbridge Line 3 project would intersect the alternatives for this proposed Project, but only underground and for the short distance needed to cross the 200-foot ROW. The Excelsior Energy and Nashwauk transmission line projects would both parallel existing transmission line corridors. Therefore, the impact of either of these two reasonably foreseeable future projects on property values in the ROI would be minimal because there is already an existing transmission lines in both of the proposed corridors.

⁹¹ The Mesaba Energy project is now expected to be a combined-cycle natural gas plant.

7.3.1.8 Electronic Interference

The ROI for electronic interference is 1,500 feet on either side of the anticipated alignment of the proposed routes and variations. This ROI was selected because it incorporates direct impacts that could result if communication towers are near the transmission line and could be impacted by the transmission line structures and corona effects as described in Section 5.2.1.5.

The reasonably foreseeable future projects listed in Section 7.2.2 could result in paralleling corridors for several electric transmission lines and two pipelines. The only cumulative impact these projects could produce would be line-of-sight interference with communications. Should this occur, it could be remedied during final design by moving the receiving antenna or other communication device or positioning the transmission line structure so it does not cause line-of-sight interference.

7.3.1.9 Transportation and Public Services

The reasonably foreseeable future projects listed in Section 7.2.2 would not be expected to impact transportation or public services. There would be increased construction vehicle traffic if all reasonably foreseeable future projects were constructed at the same time, but this impact would result in short-term, adverse traffic impacts. The MN PUC Route Permit would require the Applicant to comply with MDOT and all applicable road authorities' management standards and policies during construction. For example, the Route Permit would direct the Applicant to provide written notice of construction to MnDOT and applicable city, township, and county road authorities to coordinate local traffic concerns. The Applicant has also committed to implement traffic control measures in accordance with the MnDOT Manual on Uniform Traffic Control Devices. (MnDOT 2014, reference (196)).

7.3.1.10 Environmental Justice

The ROI for environmental justice comprises all the census tracts intersected by the 200-foot ROWs of the proposed routes and variations. Potential cumulative impacts on environmental justice could occur due to the proximity of the reasonably foreseeable future projects to low-income and minority populations, which could result in disproportionately high and adverse human health or environmental effects on those populations. If low-income and minority populations live near the projects, then construction and operation of the proposed Project and reasonably foreseeable future projects could subject those populations to

disproportionate impacts due to adverse impacts to air quality, socioeconomics, transportation, and public service, EMFs, implantable medical devices, stray voltage, induced voltage, and subsistence. However, since there is a low percentage of minority and low-income populations in the project area (Section 5.2.1.7), these populations would not be disproportionately affected by the proposed Project, variations, or the reasonably foreseeable projects).

7.3.1.11 Socioeconomics

The ROI for socioeconomic impacts includes the counties intersected by the proposed routes and variations. From north to south, the ROI includes the counties of Roseau, Lake of the Woods, Beltrami, Koochiching, and Itasca as the majority of potential socioeconomic effects from the proposed Project would occur in these counties.

If all the reasonably foreseeable future projects listed in Section 7.2.2 were constructed at the same time, there would be a cumulative socioeconomic benefit, primarily in the form of short-term construction employment and long-term revenue from taxes. A complete analysis of socioeconomics for the proposed Project can be found in Section 5.2.1.8. During construction, an average of 120 construction workers would be employed annually during the construction period from 2017 through 2020. In the peak year of construction, the proposed Project would directly employ approximately 213 workers (University of Minnesota-Duluth 2013, reference (36)). Along with these construction jobs, tax revenues, gross output, and value-added spending (reported in 2013 dollars) would occur from development and construction of the proposed Project. During the five-year construction phase, the proposed Project would generate approximately \$26.5 million dollars in state and local taxes through compensation, business, household, and corporation taxes. Combined with taxes paid at the state and local level during the development (pre-construction) phase, the total state and local taxes would be approximately \$28 million (University of Minnesota-Duluth 2013, reference (36)).

The Mesaba Energy project, if constructed, would also contribute to significant increases in construction jobs for Itasca County and the entire Arrowhead Region. The EIS for the Mesaba Energy project predicted that during the peak construction year, approximately 1,600 direct construction jobs would be created in the region, including those jobs which provide goods and services for the project. Another 955 new jobs in numerous industries were estimated to be induced by the Mesaba Energy

project through increased consumer spending. No estimates of construction or operation phase jobs for a natural gas combined cycle facility (without coal gasification) are currently available for the Mesaba Energy project. The Enbridge Sandpiper pipeline project and the Enbridge Line 3 project would also create new employment during construction in the area, and could contribute to a temporary housing shortage in the area all these projects were to be constructed at the same time. Because Grand Rapids is within commuting distance of the construction area of these reasonably foreseeable future projects, any housing shortage would not be expected to be significant.

Along with the cumulative socioeconomic impacts from the Mesaba Energy project and the pipeline projects, there are socioeconomic implications of the proposed Project's potential effect on the regional electric grid. The Midcontinent Independent System Operators (MISO) published a study, the MISO Manitoba Hydro Wind Synergy Study, which analyzed a new 500 kV interconnection with Manitoba. (Table 5.7 of MISO 2013, reference (197)). The study concluded that such a connection would provide "significant benefits" to the entire MISO footprint, including substantial reductions in wind curtailments and better utilization of both wind and hydro resources, meaning increased efficiency of the energy supply system as a whole. Over a 20-year timeframe, these benefits were valued at approximately \$1.6 billion in 2012 dollars for the northern MISO region.

7.3.1.12 Recreation and Tourism

The ROI for impacts to recreation includes county, state, and federal parks and forests, state SNAs, state trails, scenic byways, and snowmobile and water trails that are located within 1,500 feet on either side of the anticipated alignment of the proposed routes and variations and within 1,500 feet of the footprint of the other elements of the proposed Project including the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, permanent and temporary access roads, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. This ROI was identified because recreation features within these areas are most likely to experience direct or indirect impacts from the proposed Project.

If all the reasonably foreseeable future projects listed in Section 7.2.2 were constructed there could be cumulative long-term indirect visual impacts, primarily to recreational boaters at lakes in Itasca County, who could see additional transmission line structures where they could be located in parallel

corridors in the vicinity of South Twin Lakes and Loon Lakes in the Blackberry Variation Area, as well as in the vicinity of O'Reilly Lake in the Balsam Variation Area. This impact is not expected to have a measureable effect on recreation and tourism, however, because the additional infrastructure would be constructed parallel to the same corridor as a section of the proposed Project. A second transmission line paralleling the same corridor as the proposed Project would have only a small incremental impact on the view from these recreation areas.

7.3.2 Public Health and Safety

This section describes potential cumulative impacts to public health and safety resources discussed in Chapter 5 and Chapter 6.

7.3.2.1 Electric and Magnetic Fields

The ROI for EMF includes a 600-foot buffer (300 feet on either side of the anticipated alignment) along the proposed routes and variations within the West, Central, East sections, as well as the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, and regeneration stations. When the proposed transmission line routes are collocated with existing transmission lines, the ROI has been expanded to a buffer of 800 feet wide (400 feet from the proposed transmission line centerline). The ROI was determined based on standard methodologies for EMF measuring and modeling that account for standard attenuation distances for these fields.

If all reasonably foreseeable future projects listed in Section 7.2.2 were constructed, it would result in paralleling of multiple electric transmission lines and an increase in electric and magnetic fields. The cumulative effects from this paralleling would be similar to the levels listed in Section 5.2.2.1 which would be below state standards for electric fields and other state and international standards on magnetic fields, therefore, potential cumulative impacts from EMFs on public health are not expected to be significant.

7.3.2.2 Implantable Medical Devices

As discussed above on EMFs, cumulative impacts from all reasonably foreseeable future projects listed in Section 7.2.2 would result in an increase in electric fields, but this cumulative increase would result in levels below state standards and is not expected to affect implantable medical devices.

7.3.2.3 Stray Voltage

The ROI for this analysis of stray voltage includes the 200-foot ROW for the proposed routes and variations within the West, Central, East sections, as well as the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, and regeneration stations. Similar to implantable medical devices, the cumulative impacts from all projects listed in Section 7.2.2 combined with the proposed Project would not be expected to have any measurable impacts from stray voltage, even on agricultural operations.

7.3.2.4 Induced Voltage

The ROI for induced voltage includes the 200-foot ROW for the proposed routes and variations within the West, Central, East sections, as well as the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, and regeneration stations. As with stray voltage, the cumulative result of all projects listed in Section 7.2.2 in combination with the proposed Project would not be expected to result in measureable increases in induced voltage. The combination of transmission lines located in parallel corridors would increase the potential for minor shocks to occur to individuals touching an ungrounded object, such as machinery, while standing directly underneath one of these lines. Adherence to best management practices (BMPs) and safety measures would avoid this impact.

7.3.2.5 Intentional Destructive Acts

The ROI for intentional destructive acts includes the 200-foot ROW for the proposed routes and variations within the West, Central, East sections, as well as the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, and regeneration stations. If the Mesaba Energy project, the Nashwauk transmission line from the Blackberry to Nashwauk, or both were constructed, they would all connect into the existing Blackberry Substation.

7.3.2.6 Environmental Contamination

The ROI for environmental contamination includes environmental contamination sites within 2,000 feet (1000-feet on either side) of the anticipated alignment of the proposed routes and variations and proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, and regeneration stations. Construction and maintenance of any transmission line involves the use of hazardous materials and the generation of waste. If handled improperly, the public and/or the surrounding environment could be adversely affected. For all the proposed routes and variations, soil would be

disturbed and, as a result, any existing contaminated soil or groundwater could be mobilized. In this case, a 2,000-foot radius was used to be conservative and to gain a comprehensive view of the potential for contamination near the proposed routes and variations. While the construction of all reasonably foreseeable future projects would increase the potential for environmental contamination through spills or excavation of contaminated sites, the adherence to BMPs would avoid these impacts.

7.3.2.7 Worker Health and Safety Considerations

While construction activity of all reasonably foreseeable future projects would increase the potential for health and safety concerns, compliance with Occupational Safety and Health Administration (OSHA) requirements would help to avoid or minimize these impacts.

7.3.3 Land-Based Economies

This section describes potential cumulative impacts from the constructions of all reasonably foreseeable future projects to land-based economic resources discussed in Chapter 6, specifically agriculture, forestry, and mining and mineral resources.

7.3.3.1 Agriculture

The ROI for agriculture includes the 200-foot ROW of the proposed routes and variations and the footprint of the other elements of the proposed Project including permanent access roads and the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, and regeneration stations.

As discussed in Section 5.3.2.1, construction of the proposed Project could result in impacts to agricultural operations and practices. The proposed Project, in combination with reasonably foreseeable future projects could cause cumulative impacts to agriculture as operations and practices which may need to be altered (e.g., row cropping around individual transmission structures) in certain areas to avoid conflicts with utilities. These cumulative impacts to agriculture would only occur in the Balsam and Blackberry variation areas, and since farmland is not common in these variation areas, adverse cumulative impacts are expected to be minimal.

7.3.3.2 Forestry

The ROI for forestry includes the 200-foot ROW of the proposed routes and variations and the footprint of the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, permanent and temporary

access roads, temporary laydown areas, temporary stringing areas, and temporary fly-in sites.

The proposed Project, in addition to the reasonably foreseeable future projects listed in 7.2.2, could collectively result in adverse, localized cumulative impacts to forestry and timber operations by removing the lands in ROWs from active timber production or forestry activity. The cumulative impacts associated with the reasonably foreseeable future projects listed in Section 7.2.2, would be limited to the southern portion of the Balsam Variation Area and the Blackberry Variation Area, where forested land is dominant, so the cumulative impacts from these projects are likely to be a small percentage of the forested area. Therefore, cumulative impacts to forestry and timber operations are expected to be minimal.

7.3.3.3 Mining and Mineral Resources

The ROI for mining and mineral resources includes the 200-foot ROW of the proposed routes and variations, permanent and temporary access roads, and the footprint of the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, temporary laydown areas, temporary stringing areas, and temporary fly-in sites.

Potential cumulative impacts on mining and mineral resources could occur if multiple projects that interfere with access to mineable resources or the ability to remove mineral resources are constructed in close proximity to or at the same time as one another. If there is a conflict between transmission lines and mineral rights, the transmission lines may have to be relocated to access the underground minerals.

The Proposed Blue Route, and the transmission line and pipeline routes for the Mesaba Energy project all cross one area of known mineral resources in the north portion of the Blackberry Variation Area. Route RA-06 for the Enbridge Sandpiper pipeline project and the Enbridge Line 3 project also would cross through areas with known mineral resources. If the Mesaba Energy project, the Enbridge Sandpiper pipeline project, and the Enbridge Line 3 project were eventually constructed in this area, portions of one or all of these projects may need to be relocated in the future in order to protect access to mineral resources.

7.3.4 Archaeology and Historic Resources

As discussed in Section 5.3.3.2, transmission line construction can result in damage, destruction, or alteration of historic buildings and buried archaeological resources. A Programmatic

Agreement (PA) is under development by Department of Energy (DOE), Tribes, Minnesota State Historical and Preservation Office (SHPO), Advisory Council on Historic Preservation (ACHP), the Applicant, and other consulting parties to avoid and minimize impacts to cultural resources (Appendix V).

Adverse cumulative effects on cultural resources may occur if ground disturbance associated with the proposed Project and other present and reasonably foreseeable projects directly destroy or damage archaeological resources, disturb the context of archaeological resources, or affect an NRHP-eligible architectural resource.

The ROI for cumulative effects assessment to archaeological resources includes the 200-foot ROW of the proposed routes and variations and the permanent and temporary access roads as well as the footprint of the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. For architectural resources, the ROI (which is the same as the Area of Potential Effect (APE)) includes the 200-foot ROW width plus the distance of a one-mile radius from the anticipated alignment of the proposed routes and variations. The additional one-mile ROI for architectural resources serves to address the potential adverse effects the proposed Project could have upon historic viewsheds, adjacent historic architectural resources, and cultural landscapes because visual intrusions can have a direct effect on the context and setting of historic architectural properties.

If the proposed Project parallels other transmission line corridors and is within the viewshed of historic architectural or built resources in the indirect APE, as defined in Section 5.3.3.1, it could have indirect, cumulative adverse visual effects on those structures if these historic architectural or built resources are determined NRHP-eligible and if setting is determined to be a character defining feature that contributes to the significance of the resource. One area where this could happen is along the Proposed Blue Route and Proposed Orange Route in the Balsam Variation Area where the proposed Project would parallel the transmission line associated with the proposed Excelsior Energy Mesaba Energy power plant. Specifically, these projects would be located in the municipality of Taconite where several historic architectural sites that have either not been evaluated or were recommended potentially NRHP eligible, recommended NRHP eligible, or considered NRHP eligible are located (Map 6-62). It is currently unknown whether the setting of any of these historic

architectural sites contributes to the significance of the resource and therefore whether it would be an adverse effect to the resource. The Enbridge Sandpiper pipeline RA-06 route, if selected, and the Enbridge Line 3 project would intersect the alternatives for this proposed Project, but would be underground and would cross the route of the proposed Project for only the 200-foot ROW and would therefore not visually impact historic resources.

Indirect, long-term, adverse visual effects on these architectural resources within the indirect APE are likely to occur wherever the transmission structures associated with the reasonably foreseeable future projects are visibly prominent and appear inconsistent with the existing setting of the architectural resources or within views to and from the architectural resources. However, since this is a developed area, none of the reasonably foreseeable future projects are expected to be inconsistent with existing settings or views surrounding architectural resources. As such, these impacts would not be expected to be significant.

7.3.5 Natural Resources

This section describes potential cumulative impacts to natural resources discussed in Chapter 6 specifically water, vegetation, and wildlife resources. The ROI for impacts to water resources, vegetation, and general wildlife (not threatened or endangered species) is the 200-foot ROW of the proposed routes and variations, permanent and temporary access roads, and the footprint of the proposed **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. This ROI was selected based on the expectation that, given the construction activities proposed and associated Applicant measures to avoid, minimize, and mitigate potential impacts, any impacts to water resources would likely occur within this area.

7.3.5.1 Water Resources

The proposed Project, in addition to the reasonably foreseeable future projects listed in Section 7.2.2, would collectively result in adverse, regional cumulative impacts to wetlands. Linear projects, such as transmission lines and pipelines, require removal of woody vegetation from the project ROWs for construction and operation. Should woody vegetation be removed from forested and/or shrub wetlands, it would convert the wetland to a different vegetation community and wetland type.

When considered collectively, the proposed Project in combination with present and reasonably foreseeable projects would be expected to cumulatively result in a conversion of wetland vegetation community and wetland type; however, these impacts are not anticipated to be significant due to the amount of surrounding shrub and forested wetlands in the region.

Total wetland acreage within the region was calculated within eight-digit hydrologic unit code watersheds that overlap the proposed Project and any of the reasonably foreseeable projects. Watersheds used in this analysis include Little Fork, Prairie-Willow, Red Lakes, Big Fork, Rapid, Two Rivers, Lower Rainy, Roseau, and Lake of the Woods and were limited to portions of the watersheds within the United States to match the extents of available NWI data. Based on NWI data, there are approximately 4,609,000 acres of wetland in the region; of this, approximately 3,384,000 million (73.4 percent) are forested or shrub wetland.

Potential cumulative wetland impacts were determined based on conversion of forested or shrub wetland to herbaceous wetland types within a 200-foot ROW for all reasonably foreseeable future linear projects or within the project footprint for non-linear projects. The proposed Project, in combination with all reasonably foreseeable future projects, would result in the conversion of 0.12 percent of NWI-determined forested or shrub wetland in the region to an herbaceous wetland type. This quantity of potential wetland conversion is not expected to be significant in the context of the region.

The long-term impacts associated with vegetation removal and subsequent vegetation maintenance of the ROWs of all reasonably foreseeable future projects could result in adverse cumulative impacts to wetland hydrology, vegetation composition, and wetland function; however, these impacts are not expected to be significant due to the amount of surrounding shrub and forested wetlands in the region. The Applicant for the proposed Project and other reasonably foreseeable future project proponents would likely need to mitigate wetland impacts as part of permit negotiations with USACE for their individual project (40 CFR 332.3).

7.3.5.2 Vegetation

Potential cumulative impacts on vegetation resources could occur if multiple projects are constructed in close proximity of one another. The clearing of vegetation and conversion from forested to open habitats could impede native vegetation by

increasing potential for spread of invasive species and noxious weeds and could also increase the effects of light penetration, wind, and humidity that is more prominent on edges between different habitat types. Projects may also permanently remove vegetation to place structures, permanent access roads, etc. Clearing of low-growing vegetation during construction is not anticipated to result in a significant cumulative impact as it would be expected that disturbed areas would be reseeded upon completion of construction. However, permanent removal of trees and shrubs along project ROWs could result in significant cumulative effects if these projects are constructed in close proximity to one another and do not minimize impacts through paralleling existing corridors.

7.3.5.3 Wildlife

Cumulative impacts for wildlife resources would be different from construction and operation activities of the transmission line. During construction of the proposed Project, wildlife could be affected by actual vegetation clearing or ground disturbance within the proposed Project footprints, as well as through the alteration of habitats following construction, as discussed in Section 5.3.4.3.

The proposed Project could result in cumulative impacts to wildlife resources when considered together with the other projects listed in 7.2.2 if those projects are constructed concurrently in close proximity. Specifically, the clearing of vegetation and disturbance of wildlife habitats could physically harm or displace wildlife species. In addition, impacts such as disturbance related to construction noise could occur. For non-listed wildlife species, these impacts would not be expected to be significant because these species do not suffer from population level declines.

Even if not constructed concurrently, these reasonably foreseeable future projects could further alter the amount and quality of habitat available to wildlife in the vicinity of the proposed Project due to tree clearing for ROWs for transmission lines and a pipeline and the facility footprint for the Mesaba Energy power plant. These reasonably foreseeable future projects are in parallel corridors for approximately nine miles with the Proposed Project; so while these impacts would be long-term, their localized nature and the availability of abundant forested habitat in the vicinity mean that these impacts would not be expected to be significant.

Operations of the reasonably foreseeable future transmission line projects in 7.2.2 could have a greater cumulative impact on avian species

through collisions and electrocutions, as discussed in Section 5.3.4.3. These cumulative impacts are not expected to be significant, though, due to the isolated nature of these impacts and the Applicant proposed measures to reduce impacts to avian species from transmission lines, which are summarized in Chapter 2.

7.3.6 Rare and Unique Natural Resources

This section describes potential cumulative impacts to rare and unique natural resources discussed in Chapter 6, specifically rare species and rare communities. The ROI for rare and unique natural resources varies by species. The ROI for federally listed species under the Endangered Species Act (ESA) includes the county for which each species is listed. Because no formal surveys for state-listed species have been conducted for the proposed Project, the ROI for state-listed species includes a one-mile buffer on either side of the anticipated alignment for the proposed routes and variations in order to obtain a broad view of species that may be present across the project. The ROI for rare plant communities includes the 200-foot ROW of the proposed transmission line and the permanent and temporary access roads in addition to the footprint of the other elements of the proposed Project: the **Iron Range** 500 kV Substation, 500 kV Series Compensation Station, regeneration stations, temporary laydown areas, temporary stringing areas, and temporary fly-in sites. These ROIs were selected based on the expectation that the majority of rare and unique natural resource impacts would likely occur due to construction and on-going transmission line operation within these areas.

7.3.6.1 Rare Species

Potential cumulative impacts to rare wildlife species could occur during construction of multiple projects that are constructed concurrently in close proximity and are similar to those described for non-listed species in Section 7.3.5.3. If cumulative effects associated with construction or operation of the proposed Project could occur to federally or state-listed species, then the potential for cumulative adverse effects could be significant.

The proposed Project, when considered with any other reasonably foreseeable future project that may involve tree removal, could contribute to cumulative impacts to the northern long-eared bat, which relies on forested habitat for roosting. If trees are cleared during the roosting period or if trees are cleared within close proximity to one another, cumulative impacts to the northern long-eared bat and its roosting habitat could be significant. A Biological

Assessment is being prepared and consultation with the U.S. Fish and Wildlife Service (USFWS) is ongoing. Avoidance, minimization, and mitigation measures for federally listed species will need to be coordinated with the USFWS in compliance with the ESA.

If rare species are located in disturbed areas of projects constructed in close proximity of one another, the cumulative impacts could be detrimental to individual rare communities; however, field surveys would be required to confirm the presence of rare species in the respective project areas prior to construction. If species are found, the Applicant would coordinate with USFWS or Minnesota Department of Natural Resources (MnDNR) regarding avoidance or mitigation. Some rare species frequently colonize disturbed areas and could benefit from new habitat created as a result of ground disturbance from multiple projects (see Section 5.3.5.2 for additional information).

7.3.6.2 Rare Communities

Potential cumulative impacts on rare communities could occur if multiple projects are constructed in close proximity of one another and are similar to those described for vegetation in Section 7.3.5.2. Permanent loss of forest would lead to fragmentation by reducing intact blocks of forest vegetation. Removal of vegetation and conversion to open habitats would increase the potential for spread of invasive species and would alter the structure and function of rare communities, potentially making them less suitable for the rare species that would typically inhabit them. Cumulative impacts to rare communities could be significant if projects are constructed in close proximity to one another and disturbance is not minimized by paralleling existing corridors.

7.4 Adverse Impacts that Cannot be Avoided

Adverse impacts would be minimized with implementation of the Applicant-proposed measures described in Section 2.13. Where feasible, this EIS suggests additional measures (mitigation) would be incorporated into the planning, design and construction of the proposed Project to substantially eliminate the adverse impacts where possible. For some impacts, adverse impacts can be reduced but not eliminated and are therefore determined to be unavoidable. Most unavoidable adverse impacts would occur during the construction phase of the proposed Project and would be temporary.

A review of impacts and possible mitigation measures is located in Chapter 5 in this EIS; the unavoidable adverse effects caused by the proposed Project that would remain after applying mitigation measures are discussed in Chapter 6.

Unavoidable adverse effects related to the proposed Project construction would last only as long as the construction period, and would include:

- Soil compaction, erosion, and vegetation degradation;
- Disturbance to and displacement of some species of wildlife;
- Disturbance to nearby residents;
- Traffic delays in some areas; and
- Minor air quality impacts due to fugitive dust.

Unavoidable adverse effects related to the proposed Project that would last at least as long as the life of the proposed Project would include:

- The addition to the visual landscape of transmission structures and lines;
- Habitat type changes and fragmentation;
- Adverse impacts to wildlife and wildlife habitat due to project-related changes to wetland type (palustrine forested (PFO) and palustrine shrub (PSS) to palustrine emergent (PEM)) and the removal of other vegetation; and
- Direct adverse impacts to wildlife as a result of avian collisions.

EMFs from the proposed Project are also unavoidable. Further details of these impacts are discussed in Section 5.2.2.1.

7.5 Relationship between Short-term uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

Short-term uses of the biophysical components of the human environment include impacts, usually related to construction activities, which occur over a period of less than five years. Long-term uses of the human environment include those impacts that occur over a period of more than five years, including permanent resource losses.

Chapter 5 identifies potential short-term, adverse impacts on the natural environment as a result of construction activities. These adverse impacts

include increases in surface water turbidity; disturbance and re-suspension of sediments in surface waters; vegetation clearing; localized habitat degradation; soil disturbance and increased potential for erosion; stormwater runoff into surface water; and increased traffic, air emissions, and noise. Long-term adverse impacts of the proposed Project include wetland vegetation community and wetland type conversion through clearing of woody vegetation in the project ROW.

The proposed Project would be expected to enable long-term productivity by importing energy generated in Canada to the U.S. power grid, thus applying downward pressure on electricity prices and replacing more emissive fossil-fueled sources of energy with hydroelectric sources.

7.6 Irreversible and Irrecoverable Commitment of Resources

Irreversible and irretrievable commitments of resources refer to impacts on or losses of resources that cannot be reversed or recovered, even after an activity has ended. Irreversible commitment applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those resources that are renewable only over long time spans, such as soil productivity. Irrecoverable commitment applies to the loss of production, harvest, or natural resources. This section discusses irreversible and irretrievable commitments of resources as a result of implementing the proposed Project; these impacts are permanent.

7.6.1 Rare Species

Activities involving heavy machinery, which could include construction, maintenance, or emergency repairs, in the proposed Project ROW could result in the direct mortality of individual listed species. Most mobile species would be expected to avoid areas undergoing active ground disturbance. The loss of an individual of a protected species would be adverse, but is not expected to have irreversible or irretrievable impacts on the species as a whole. A draft Biological Assessment is being prepared in order to determine the impacts of the proposed Project on federally listed species, and DOE and USFWS consultation under Section 7 of the ESA is on-going (Appendix Q).

7.6.2 Wetland Type Conversion

The proposed Project would permanently clear woody vegetation from forested and shrub wetlands, allowing for only short-stature vegetation to regrow.

Though removing woody vegetation within a forested or shrub wetland would not reduce overall wetland acreage, it would convert the forested or shrub wetland area to a different vegetation community and wetland type. This would be considered an irretrievable and irreversible impact because the area would be continuously managed in an emergent, herbaceous state for the life of the project. This change could significantly shift the vegetation composition and hydrologic function and result in a measureable decrease in water uptake by vegetation. This decrease could have an associated influence on the suitability of wildlife habitat for certain species as well as wetland function.

represents employment opportunities and is considered beneficial.

7.6.3 Materials

Material resources irretrievably used to construct the proposed Project could include copper, lead, steel, concrete, bitumen, and other materials. These materials are not in such short supply that implementation of the proposed Project would limit other unrelated construction activities and their use would not be significant.

7.6.4 Energy

Energy resource used to construct the proposed Project would be irretrievably lost. During construction, gasoline and diesel fuel would be used for the operation of vehicles and heavy equipment. Intermittent inspection and emergency repair activities would also require gasoline and diesel fuel. Overall, consumption of energy resources would not place a significant demand on their availability in the region. Therefore, limited impacts are anticipated from the consumption of energy.

7.6.5 Landfill Space

The disposal of any excavated soils or other construction materials in a landfill would be an irretrievable, adverse impact. There are several landfills and construction and demolition processing facilities that could manage waste generated by construction of the proposed Project. However, any waste generated by the proposed Project that is disposed of in a landfill would be considered an irretrievable loss of that landfill space.

7.6.6 Human Resources

The use of human resources for construction is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources

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