APPENDIX F
Wetlands Documents –

Documentation for USACE (F1), Floodplain and Wetlands Assessment (F2)

(Note: Color versions of figures in this Appendix are included in the file posted at the DOE NEPA website: http://www.eh.doe.gov/nepa/docs/deis/deis.html)

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APPENDIX F1
Documentation for USACE

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DOCUMENTATION PRESENTED TO THE U.S. ARMY CORPS OF ENGINEERS IN SUPPORT OF EXCELSIOR ENERGY INC.'S APPLICATION FOR A SECTION 404 PERMIT

Clean Water Act Section 404(b)(1) Alternatives Analysis

Pursuant to regulations promulgated under Clean Water Act, Section 404(b)(1), the United States Army Corps of Engineers ("Corps") is required to determine that there is no alternative to the proposed action that is practicable, is less damaging to the aquatic ecosystem, and has no other significant, adverse environmental effects. *See* 40 C.F.R. § 230.10(a). The following analysis demonstrates that Excelsior Energy Inc.'s (hereafter "Excelsior") preferred and alternative sites (hereafter, the "West Range Site" and "East Range Site," respectively) represent the only practicable alternatives from which the least environmentally damaging practicable alternative ("LEDPA") will be selected.

OVERALL PROJECT PURPOSE FROM A PUBLIC INTEREST PERSPECTIVE

In its analysis of alternatives to a proposed activity, the Corps is required to "consider and express that activity's underlying purpose and need from a public interest perspective." *See* 33 C.F.R. pt. 325, App. B, § 9(b)(4). The EIS includes a statement of the purpose and need for the project from the standpoint of Excelsior, the Department of Energy ("DOE"), and the State of Minnesota. *See* EIS §§ 1.4.1-.2. Excelsior proposes the following summary as an overall statement of project purpose for concurrence by the Corps:

The Mesaba Energy Project is a multi-purpose project, whose purposes from a public interest perspective include, but are not limited to, the following:

1. ***Confirm the commercial viability of generating electrical power by means of integrated gasification combined cycle ("IGCC") technology in a utility-scale application;***
2. ***Help satisfy Minnesota's need for additional sources of baseload power;***
3. ***Implement the state's energy policies, including:***
    - ***a. Ensure safe, reliable, and efficient utility services at fair and reasonable rates;***
    - ***b. Enhance competition in the wholesale electric power market within Minnesota;***
    - ***c. Develop facilities that make use of innovative generation technology utilizing coal as a primary fuel in a highly efficient combined-cycle configuration;***
    - ***d. Develop solid fuel baseload technologies with significantly reduced emissions of particulate matter, mercury, SO_2 and NO_X;***
    - ***e. Decrease the State's growing dependence on natural gas for power generation;***
    - ***f. Develop solid fuel baseload generation technologies which can capture and sequester carbon emissions;***
    - ***g. Develop technologies and facilities capable of using flexible fuel stocks and capable of producing hydrogen, synthetic gas and other fuels to provide energy supply hedges for Minnesota users;***

h. Support the development of energy systems which enhance national security;

i. Fulfill the state's mandate for proposing large electric power generating sites capable of accommodating future capacity expansions; and

4. Utilize the incentives established by the State of Minnesota (see Minn. Stat. §§ 216B.1693-.1694) and the United States government (see 42 U.S.C. § 16513(c)(1)(C)) for the construction and operation of an Innovative Energy Project.

CONSIDERATIONS SUPPORTING NEED FOR THE PROJECT

In light of the above purposes, the following considerations support the need for the project from a public interest perspective.

Need to Confirm IGCC Technology

The need to confirm the commercial viability of IGCC technology in a utility-scale application has been determined by the DOE in furtherance of the Clean Coal Power Initiative ("CCPI"). Congress provided funding and guidelines for this program pursuant to Public Law 107-63 enacted in November 2001. Coal accounts for over 94% of the proven fossil energy reserves in the U.S. and supplies over 50% of the nation's electricity. Priorities covered by the President's National Energy Policy "include increasing the domestic energy supply, protecting the environment, ensuring a comprehensive energy delivery system, and enhancing national energy security." Clean Coal Power Initiative "Program Fact Sheet," *available at* www.fossil.energy.gov. Promoting IGCC technology through the CCPI "provides an important platform responding to these priorities." *Id*. Specifically, "the National Energy Policy seeks to lessen the impact on Americans of energy price volatility and supply uncertainty. Such uncertainty increases as we reduce America's dependence on foreign sources of energy." White House National Energy Policy, "Overview," *available at* www.whitehouse.gov/energy. Because coal is the nation's most abundant domestic fuel resource, the "government's investment in CCPI recognizes the crucial benefits to our nation's economic stability and security that can be achieved through clean coal research." CCPI "Program Fact Sheet," *supra*. U.S. Senator Norm Coleman (R-MN) also explained one of the important purposes of the Mesaba Energy Project,

> [a]s concerns about natural gas prices and supply grow, this project is a step in the right direction. By increasing efficiency and reducing emissions, this project will continue energy production without forsaking the resources that sustain us. I'm proud at [sic] the vision for future energy this project sets before Minnesota and the rest of the country as it means greater diversification of energy and reduction on our dependence on foreign sources of oil.

Press Release: "Coleman Announces $36 Million DOE Grant for Excelsior Energy's Mesaba Energy Project," October 26, 2004.

Need to Provide Baseload Power for Minnesota

The need for additional sources of baseload power to serve Minnesota is documented in the resource plans filed with and approved by the Minnesota Public Utilities Commission

("MPUC"). These plans are prepared by Minnesota's electric power utilities pursuant to Minn. Stat. § 216B.2422 and Minn. R. ch. 7843. The utilities are required to estimate the needs of their customers over the forecast period. *See* Minn. Stat. § 216B.2422, subd. 2. The plans demonstrate the following need for additional base load power supplies by the year 2020:

- 864-1804 Megawatts ('MW") for Northern States Power d/b/a Xcel Energy
  2002 Integrated Resource Plan, p. 44 (MPUC Docket RP-02-2065)
  2004 Updated Integrated Resource Plan, pp. 23, 27 (MPUC Docket RP-04-1752)
  2005 Rate Case, Findings of Fact, pp. 7-8 (MPUC Docket GR-05-1428)
- 150 MW for Minnkota Power Cooperative and Northern Municipal Power Agency
  2006 Integrated Resource Plan (MPUC Docket RP-06-977)
- 600 MW for Great River Energy
  2005 Integrated Resource Plan, p. 20, (MPUC Docket RP-05-1100)
- 150 MW for Dairyland Power Cooperative
  2004 Integrated Resource Plan, pp. 10 to 11 of 53 (MPUC Docket RP-05-184)
- 1000 MW for Interstate Power and Light
  2005 Integrated Resource Plan, Initial Filing, Appendix 9C (MPUC Docket RP-05-2029)
- 150 MW for Missouri River Energy Services
  2005 Integrated Resource Plan, Supplement, p. 11 (May 8, 2006) (MPUC Docket RP-05-1102)
- 294.8 MW for Otter Tail Power Company
  2005 Integrated Resource Plan, (MPUC Docket RP-05-968)
- 200 MW for Minnesota Power
  2004 Integrated Resource Plan, Supplemental Filing, p. 22 (MPUC Docket RP-04-865)
- 147 MW for Southern Minnesota Municipal Power Agency
  2006 Integrated Resource Plan, p. IV-39 (MPUC Docket RP-06-605)

In addition to the amounts stated above, Excelsior estimates that there may be a need for 600-800 MW for new potential steel and copper-nickel developments on the Iron Range. The grand total of documented need in the resource plans plus the amounts needed for steel and copper-nickel developments ranges from about 4,160 MW on the low end to about 5,300 MW on the high end by the year 2020.

Need to Implement State Energy Policy

The need to promote Minnesota's energy policies through the development of innovative generation technology utilizing coal as a primary fuel has been determined by the Minnesota Legislature. In its 2003 Special Session, the Minnesota Legislature passed a broad-reaching energy act that, in addition to addressing the storage of spent nuclear fuel, recognized the need to provide for the development of new and alternative sources of energy. *See* 2003 Minn. Laws, 1st. Spec. Sess., ch. 11. Among the options addressed, the Legislature placed special emphasis upon the development of a project "that makes use of an innovative generation technology utilizing coal as a primary fuel in a highly efficient combined-cycle configuration with significantly reduced sulfur dioxide, nitrogen oxide, particulate, and mercury emissions from those of traditional technologies." *See* 2003 Minn. Laws, 1st. Spec. Sess., ch. 11, art. 4, § 1, *codified as* Minn. Stat. § 216B.1694, subd. 1(1). Further, the Mesaba Energy Project is consistent with Governor Tim Pawlenty's recently expressed energy policy goal of reduced greenhouse emissions. *See* Governor Tim Pawlenty "State of the State Address," January 17,

2007. The IGCC technology utilized by the Mesaba Energy Project offers the potential to capture and sequester carbon dioxide if future regulations impose this requirement on coal-fired power plants and/or other sectors of the economy. The Mesaba Energy Project would capture carbon dioxide more efficiently and more cost effectively than other existing power plants in the state. *See* Excelsior Energy, Inc., Mesaba Energy Project Plan for Carbon Capture and Sequestration (October 10, 2006 Revision I). In addition, the Mesaba Energy Project's significantly reduced mercury emissions comport with the "aggressive mercury reduction initiative" that Governor Pawlenty signed into law in May of 2006. *See* Statement of Governor Tim Pawlenty, May 4, 2006.

Need to Utilize State and Federal Incentives for An Innovative Energy Project

A. State Incentives

The need to utilize the incentives established by the Minnesota Legislature is driven by the practicalities and risks of a project of this kind. The legislature properly recognized that special forms of assistance would be necessary to realize the goal of developing an Innovative Energy Project. The specific regulatory incentives established by law are as follows:

- exemption from the requirements for a certificate of need;
- eligibility to increase capacity without additional state review;
- the power of eminent domain for sites and routes approved by the MPUC;
- status as a "clean energy technology" for the supply of electric energy to a utility that owns a nuclear generating facility;
- the right to enter into a contract with a public utility that owns a nuclear generation facility to provide 450 megawatts of baseload capacity; and
- eligibility for a $10 million grant from the renewable development account for development and engineering costs.

See Minn. Stat. § 216B.1694, subd. 2. But for the provision of these incentives, it would be difficult to finance and develop an Innovative Energy Project within the state. In order to take advantage of these important and unique incentives for an Innovative Energy Project, the law specifies that the project must be located on a site "in the Taconite Tax Relief Area" ("TTRA") of northeastern Minnesota. *See* Minn. Stat. § 216B.1694, subd. 1(3). A project located elsewhere in the state would not enjoy these or any similar package of incentives.

The legislature entitled an "Innovative Energy Project" to enter a long term contract with Xcel Energy for the sale of the capacity and energy from the IGCC facility. *See* Minn. Stat. §216B.1694, subd. 2(a)(7). "This incentive – providing a secure off-take agreement — is acknowledged by industry analysts as the key to overcoming the largest single barrier to widespread deployment of the IGCC technology." *See* Executive Summary, Mesaba Energy Report to the Minnesota Public Utilities Commission, MPUC Docket No. E-6472-/M-05-1993 (Dec. 23, 2005), p. 3. Were the Mesaba Energy Project developed on a site outside of the TTRA, it would no longer be entitled to a secure off-take agreement with Xcel, nor any of the other valuable incentives provided to Innovative Energy Projects by the legislature.

B. Federal Incentives

Similarly, the United States Congress has identified the importance of supporting the development of IGCC in the Northeastern Minnesota. In particular, the Energy Policy Act of 2005 ("EPAct 2005") authorizes the Secretary of the Department of Energy to make eligible for loan guarantees "a project located in a taconite-producing region of the United States that is entitled under the law of the State in which the plant is located to enter into a long-term contract approved by a State public utility commission to sell at least 450 megawatts of output to a utility." 42 U.S.C. § 16513(c)(1)(C). *See also* 42 U.S.C. § 16514(b) Not only does this provision expressly require the project to locate in a taconite producing region of the United States, but the project's specific eligibility for loan guarantees is further conditioned upon the its entitlement to a long-term contract with a utility. As discussed above, this entitlement is contingent upon the project's location in the TTRA under Minnesota law, and hence, so too is the federal loan guarantee provision.

Federal loan guarantees are important to the development of innovative and emerging technologies because the lower cost of capital associated with federally guaranteed loans helps to offset the typically higher capital costs of such projects. As a result of lower cost debt financing, the Mesaba Project is expected to achieve cost parity with a utility-owned supercritical pulverized coal plant.

LIMITATION OF ALTERNATIVES TO SITES WITHIN THE TTRA

Taken as a whole, the purposes of the Project require a site within the TTRA.

The commercial viability of IGCC technology on a utility-scale might, in theory, be confirmed elsewhere in the United States. In fact, the Project was selected for DOE funding in a nationwide competitive solicitation process, and it is now generally acknowledged that the Mesaba Energy Project is uniquely positioned to develop an IGCC project on an expedited basis. The important national goals of energy independence and improved environmental performance place a premium on developing this important energy source as soon as possible.

The provision of additional sources of base load electricity might possibly be provided from outside Minnesota. Minnesota's energy policies, however, can only be fulfilled within the state. The construction of an IGCC facility outside the state would leave the broader goals of Minnesota's energy policy unfulfilled. Minnesota's 2003 energy act demonstrates the importance of developing an IGCC facility within the state. It is vital for this energy source to be located within Minnesota's borders, both to provide energy security for the state and also to afford the state the degree of control that allows the state to promote its policy goals.

Ultimately, to qualify for the incentives that the Minnesota Legislature established for the construction and operation of an Innovative Energy Project, the facility must be built within the TTRA. The 2003 legislation expressly provides that, to qualify as an Innovative Energy Project and receive the regulatory incentives, the project must located within the TTRA. *See* Minn. Stat. § 216B.1694, subd. 1(3). The Minnesota Legislature has determined that the incentives for the construction of the Project should be limited to the TTRA. As noted above, these incentives are a practical necessity for the realization of the project, and the United States Congress has also

identified the importance of supporting the state's desire to develop IGCC in northeastern Minnesota. *See* 42 U.S.C. § 16513(c)(1)(C).

Governor Pawlenty has been unequivocal in his support of the project and its location within the TTRA:

> The Mesaba Energy Project will supply much-needed energy and jobs in an innovative way that protects our environment and natural resources using an affordable, abundant domestic fuel source.
>
> ***
>
> As a state, our support for this project is part of a longer, long-term economic development strategy that will diversify the economy of the Iron Range. While traditional mining will remain a vital part of the Range economy, we must look to the future for the next generation of economic development projects.

Statement of Governor Tim Pawlenty, October 26, 2004. The benefits of the Mesaba Project to the economy of the Iron Range will not be realized if the Project is constructed outside of the TTRA.

In sum, only a site within the TTRA will fulfill the project's multiple purposes, including the state and federal legislative policies of supporting IGCC development in northeastern Minnesota.

ANALYSIS OF ALTERNATIVES WITHIN THE TTRA

Site Selection Process

Although numerous studies involving the selection of coal-fired power plant sites have been published, a recent presentation by the U.S. Department of Energy's National Energy Technology Laboratory ("NETL") has briefly described the most critical elements as follows[1]:

- Access to transmission lines,
- Available fuel, and
- Water.

The state of Wisconsin has published a host of additional power plant siting criteria that are commonly used in the site selection process.[2] Excelsior's site selection efforts addressed these same fundamental concerns and included the following four steps:

- Developing site selection criteria;
- Identifying potential sites;
- Establishing a short list of sites having the greatest likelihood of licensing success; and

[1] Hoffmann, Feeley, and Carney, "DOE/NETL's Power Plant Water Management R&D Program –Responding to Emerging Issues,"
8th Electric Utilities Environmental Conference, Tucson, AZ, January 24-26, 2005. *See* http://www.netl.doe.gov/technologies/coalpower/ewr/pubs/05_EUEC_Hoffmann_1.pdf.

[2] Public Service Commission of Wisconsin, "Common Power Plant Siting Criteria." September 1999. *See* http://psc.wi.gov/thelibrary/publications/electric/electric05.pdf.

- Specifying two licensable sites for consideration under rules implementing the state's Power Plant Siting Act, one site of which is to be designated as preferred.

Each of these four site selection steps is discussed in further detail below.

Step One: Development of Site Selection Criteria

Site selection criteria represent specific elements of concern that are collectively used to characterize the potential of an existing site for accommodating the footprint and infrastructure required for Phase I and Phase II of the Mesaba Energy Project (hereafter, "Mesaba One and Mesaba Two," "IGCC Power Station" or the "Station"). Excelsior has divided its site selection criteria into the following three categories: permitting, technical, and site control. Permitting criteria are focused on issues related to the relative feasibility of obtaining preconstruction permits necessary to construct and operate the IGCC Power Station. Technical criteria focused on the feasibility of constructing and operating the Station, and site control criteria considered the likelihood of obtaining site ownership and control in a timely manner with landowner cooperation. Table 1 lists the specific elements considered under each of these three categories.

Step Two: Identifying Initial Sites

Existing Industrial Facilities

Excelsior initiated its siting efforts by identifying within the TTRA numerous sites in separate industrial complexes where the IGCC Power Station could share synergies with existing industrial operations. Such industrial sites might represent a desired option for developing the Station based on the infrastructure that has been constructed to serve existing industrial operations. However, the IGCC Power Station cannot be indiscriminately placed in industrial locations. For example, many sites on the Iron Range, but off the "iron formation" have been used as auxiliary mining lands and include areas where large quantities of rocks and soil (stripped to expose natural mineral resources) have been placed. These areas, commonly referred to as "mine dumps" are not suitable locations upon which to place the IGCC Power Station because there is no feasible way to establish where foundations can be constructed thereon and perform adequately. In general, the same is true for large areas where tailings[3] have been sluiced and left to settle[4].

[3] Waste or refuse left in various processes of milling, mining, etc. From: Webster's New World College Dictionary, 4th Edition, Michael Agnes, Editor, Wiley Publishing, Inc.

[4] Loose, water-saturated sands and silts of low plasticity may have adequate shear strength under static loading conditions; however, if such materials are subjected to vibratory loading, they may lose strength to the point where they flow like a fluid. The process in which susceptible soils become unstable and flow when shocked by vibratory loading is called liquefaction, and it can be produced by vibration from blasting operations, earthquakes, or reciprocating machinery. In very loose and unstable deposits, liquefaction can occur as the result of disturbances so small that they are unidentifiable. *See* www.usace.army.mil/publications/eng-manuals/em1110-2-1911/c-3.pdf page 7.

Table 1. Excelsior's Site Selection Criteria

Code	*Permitting Criteria*	*Description*
P1	Air	What is the potential impact on Class I areas, including cumulative impacts of current and proposed projects?
P2	Wetlands	What is the potential for wetland impacts and mitigation if required?
P3	Groundwater	Will there be any solid waste disposal landfills on the site? If so, what is the depth to groundwater and how might groundwater be impacted?
P4	Floodplains	How will the proposed Project impact floodplains on the site?
P5	Water Supply	Are potential sources of water supply available, in what quantity/quality, and from what source or sources?
P6	Wastewater Discharges	Are POTWs located in proximity to the site, and can such POTWs accommodate plant-derived wastewaters? Are there bodies of water nearby that can accommodate the wastewater after appropriate treatment?
P7	Great Lakes Initiative ("GLI")	Is the proposed site located within the Lake Superior Basin watershed? If so, can wastewater discharges meet the low GLI mercury discharge criteria as such limits can be below the background mercury levels found in some Northeastern Minnesota surface waters?
P8	Natural/Cultural Resources	Does the site present any special concerns with respect to areas of archaeological/architectural importance or with respect to threatened and endangered species?
P9	Land Use	Is the current zoning designation compatible with industrial activities? What are the future land use plans for the proposed site and areas surrounding it?
Code	*Technical Criteria*	*Description*
T1	Plant Expansion	Is there sufficient contiguous acreage available to accommodate the Phase I and Phase II Developments, including rail loop, and to isolate the facility for safety, security, dissipation of noise, and other considerations?
T2	Physical Characteristics	What are the size, shape, topography, and underlying soil conditions of the site? What are the subsurface characteristics? Are there any geohazards that would preclude use of the proposed site or confine the proposed facilities to specific areas?
T3	Rail Access	Is there adequate rail access for delivery of key pieces of equipment during construction, and for delivery of coal and pet coke for operation? Is it possible to develop more than one rail transportation option? Can Great Lakes ports be utilized to help meet fuel transportation needs?
T4	Transmission	How and where does the generator interconnection to the transmission system occur? What transmission system network reinforcements, beyond the POI, may be required to accommodate planned generating facilities?
T5	Natural Gas	How and where does the interconnection to the natural gas pipeline system occur and what is its available capacity?
T6	Industrial Processing	How close is the nearest large industrial processing facility? Do potential synergies exist with such facilities, including use of warmed water for industrial process uses, syngas as a substitute for natural gas, common use of facilities, etc.?
Code	*Control Criteria*	*Description*
C1	Site Control	Is it likely that site control can be obtained in a timely manner?

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Although certain owners of existing industrial operations showed an initial willingness to consider co-locating the IGCC Power Station on their sites, none showed a real interest in establishing an agreement that would serve Excelsior's purposes throughout the duration of Minnesota's power plant siting process.[5] As Excelsior will only have the power of eminent domain for sites and routes that are ultimately approved by the MPUC,[6] the unwillingness of such owners to agree to reasonable terms required the company to find other siting options.

Screening Process

Excelsior used geographical information system ("GIS") mapping software to identify areas within the TTRA potentially capable of supporting development of the IGCC Power Station. In general, the areas within the TTRA where Excelsior focused its search depended upon access to existing rail lines (i.e., the means by which coal will be delivered to the Station) and the presence of the following attributes:

- Availability of water for cooling and other Station purposes;
- Proximity to existing high voltage transmission line corridors that can be used to minimize environmental impacts associated with interconnecting the Station to the regional electric grid;
- Feasibility of acquiring large blocks of land in a timely manner,
- Reasonable distance from nearby landowners;
- Reasonable proximity to a major natural gas pipeline; and
- High proportion of upland to wetland areas.

Rail Access

Figure 1 shows the location of major rail trackage within the TTRA. Excelsior has used a six-mile buffer centered on each major rail line (that is, three miles on each side) to provide a general indication of the characteristic area within which Excelsior believes it feasible to construct and operate the IGCC Power Station. The costs and logistical challenges of securing rights of way and constructing rail to a site beyond this buffer, in addition to the likelihood of greater wetland impacts for longer rail alignments, generally renders such sites unworthy of consideration.

Dual rail service via two major rail suppliers using their own track has been identified as a positive attribute in terms of Excelsior's siting evaluation. The optionality created by such fuel supply and transportation diversity allows for fuel supply contracting options that should minimize the Project's fuel costs and allow for a contracting strategy that can incorporate supply contracts of varying terms and supply quantities and spot market access. At a minimum, the Project should have a fuel supply cost that is equal to the fuel supply costs of other regional

[5] The rules established to carry out the State's Power Plant Siting Act processes are found at Minn. R. Chapter 4400. To avoid the possibility of losing a site in the midst of the regulatory processes, Excelsior required some evidence of the owner's long-term intention for serving as a host to the IGCC Power Station.

[6] The statutes established in support of Innovative Energy Projects (Minn. Stat, §216B.1694 Subd. 2(a)(3)) provide such projects "the power of eminent domain, which shall be limited to the sites and routes approved by the … [Minnesota Public Utilities Commission] for the project facilities."

fossil fueled power plants operated by NSP and Minnesota Power.[7] The optionality available to Mesaba Energy Project should allow for fuel mixes that are lower in overall cost than these regional suppliers over the long term[8].

Water Availability

The Joint Application ("JA") Excelsior has submitted in support of the Power Plant Siting process identifies the IGCC Power Station's water requirements depending upon whether or not the Station is located in the Lake Superior Basin watershed. Table 2 provides the water requirements if the Station is located outside the Lake Superior Basin; Table 3 if the Station is located therein.

Table 2. IGCC Power Station Water Appropriation Requirements: Outside Lake Superior Basin

Phase	Average Annual Appropriation (GPM)	Peak Appropriation (GPM)
I	4,000[a]-4,400[b]	6,500
I & II	8,800[b]-10,300[c]	15,200

[a]Based on 8 cycles of concentration ("COC") in the gasification island and the power block cooling towers
[b]Based on 5 COC in the gasification island and the power block cooling towers
[c]Based on 3 COC in the gasification island and the power block cooling towers

Table 3. Water Appropriation Requirements: Inside Lake Superior Basin

Phase	Average Annual Appropriation (GPM)	Peak Appropriation (GPM)
I	3,700[a]	5,000
I & II	7,400[a]	10,000

[a]Based on 8 COC in the gasification island and the power block cooling towers

New facilities (as defined at 40 CFR 125.83) locating on waters of the United States and i) withdrawing more than 2 million gallons per day, ii) using more than 25% of that volume for cooling purposes, and iii) using a cooling water intake structure ("CWIS") to divert such volumes of water to the source are restricted as to the amount of water that can be withdrawn from such waters. Since the Mesaba Energy Project would be a new facility and would meet these criteria it would be subject to rules governing cooling water intake structures (see 66 FR 65256). Such rules restrict the amount of water that can be withdrawn from freshwater rivers, streams, lakes and reservoirs. Withdrawals from freshwater rivers or streams must be no greater than 5 percent of the source waterbody mean annual flow; withdrawals from a lake or reservoir must not disrupt the natural thermal stratification or turnover pattern (except where such disruptions are determined to be beneficial to the management of fisheries). At 40 CFR

[7] Excerpt from October 10, 2006 rebuttal testimony of Ralph Olson before the Minnesota Public Utilities Commission. *See* http://www.excelsiorenergy.com/public/index.html to obtain complete testimony of Mr. Olson regarding Excelsior's fuel procurement strategy.
[8] Ibid, page 2, line 9.

125.84(e), the final rule governing CWISs recognizes that a State may include more stringent requirements to the location, design, construction and capacity of a CWIS at a new facility[9].

In evaluating flows in freshwater rivers or streams, Excelsior used daily flow information obtained from United States Geological Survey gauging stations. Impacts associated with withdrawals from lakes or reservoirs were estimated using information about the area of the specific resource, its maximum depth, and the area of the littoral zone obtained from the Minnesota Department of Natural Resources' ("MDNR") Lake Finder web site[10]. Excelsior assumed no inflow to such resources (approximating conditions that would be present during times of drought) and calculated the time it would take to lower the level of the lake or reservoir to the point where water in the littoral zone was completely depleted.

The use of groundwater in quantities suitable to meet the cooling requirements for the IGCC Power Station are generally discouraged by Minn. R. 4400.3450 ("Prohibited Sites") Subpart 5 ("Sufficient water supply required"). This subpart of Minnesota rules states the following:

> "No site may be designated that does not have reasonable access to a proven water supply sufficient for plant operation. No use of groundwater may be permitted where removal of groundwater results in material adverse effects on groundwater, groundwater dependent natural resources, or higher priority users in and adjacent to the area, as determined in each case.
>
> The use of groundwater for high consumption purposes, such as cooling, must be avoided if a feasible and prudent alternative exists."

High Voltage Transmission Lines/Natural Gas Pipelines

Excelsior's strategy for interconnecting the Station to a major electrical substation is to use existing HVTL corridors to the extent feasible. The further the Station is located from such substations the higher interconnection costs become. In addition, the lower the HVTL voltage within an existing corridor, the narrower the existing right of way ("ROW") for that corridor is likely to be. The voltage for the preferred generator outlet facilities serving MEP-I and MEP-II will be 345 kV. The required ROW for the 345 kV tower configuration to be used for these facilities is generally found to be less than or equal to the current ROW serving many of Minnesota Power's 115 kV HVTLs. This would not be the case for the smaller distribution HVTLs found in the TTRA north and east of Virginia, Minnesota[11]. Therefore, although there is rail track found north of Virginia, there are no suitable sized HVTL corridors within which MEP-I and MEP-II could be placed absent the acquisition of additional ROW.

Although there is existing rail service south of and east of Hoyt Lakes, there are no HVTLs corridors of suitable size to accommodate the right of way required for HVTLs sized to carry the

[9] In the proposed rules, the maximum amount of water that could be withdrawn from a river was 25 percent of the 7Q10 or 5 percent of the mean annual flow, whichever was lower. Although the language including the 7Q10 was dropped from the final rules, the state could deem it appropriate if it appeared that 5% of the mean annual flow did not sufficiently protect aquatic resources.

[10] See http://www.dnr.state.mn.us/lakefind/index.html. The littoral zone is defined as that portion of the lake that is less than 15 feet in depth. The littoral zone is where the majority of the aquatic plants are found and is a primary area used by young fish. This part of the lake also provides the essential spawning habitat for most warmwater fish (e.g. bass, walleye, and panfish).

[11] HVTLs found north and east of Virginia, Minnesota mostly belong to Great River Energy (GRE). See http://www.greatriverenergy.com/about/brochure1.html for a general comparison of right of way widths found in the Great River Energy transmission line portfolio. Also see http://www.tva.gov/power/rightofway/faq.htm,

output of MEP-I and MEP-II. A 115 kV HVTL runs along the North Shore of Lake Superior at the extreme southern end of this region, but water could not be feasibly obtained in the quantity required to support MEP-I and MEP-II[12]

The only natural gas pipelines capable of providing the capacity required by MEP-I and MEP-II are the two 36" diameter Great Lakes Gas Transmission Company pipelines that parallel the southeastern boundary of the TTRA. The further the distance between the Station and this pipeline, the more costly it becomes to interconnect them.

Wetlands

Wetlands and open water cover large areas of the TTRA and represent a determinative factor in almost every siting decision therein. Areas where wetlands represent a primary factor lie in the southern portion of the TTRA within the buffer area of the existing rail lines near the confluence of the St. Louis and Cloquet Rivers. In this proximity, areas that would appear to be capable of supplying sufficient water to MEP-I and MEP-II are excluded due to their relatively high impact on wetland resources.

Property Ownership

As noted previously in this document under "Need to Utilize State and Federal Incentives for an Innovative Energy Project" (*see* Section A entitled "State Incentives") and Footnote No. 6, such projects are granted the power of eminent domain for sites and routes approved by the Minnesota Public Utilities Commission. The statute was written so that site/route selection issues could be discussed in the public forum provided as part of the environmental review process. The rights of existing landowners are provided substantial protection in this arena in that both regulators and project proponents seek to minimize the instances under which eminent domain is exercised. Obtaining sites that consist primarily of dozens of small landowners presents a serious logistical problem and would be very likely to necessitate the use of eminent domain. Therefore, in its site screening process, significant deference is given to locations where the number of landowners is low and where no relocation of residents would be dictated. Additionally, sites already owned and used by other industrial entities as part of their mineral extraction activities within the iron formation are very unlikely to be obtainable through purchase or eminent domain, making the exclusion of such sites appropriate.

Other Exclusion Zones

Iron Formation

Although abandoned mine pits in the iron formation represent an area where there is generally an abundance of water, the formation itself represents an exclusion zone within which non-mining operations are unlikely to be allowed to locate.[13]

[12] The only appropriate source of water in the area just north of Lake Superior is the lake itself. Excelsior does not believe it is reasonable to assume that a large electric power generating plant would be permitted on the shore of Lake Superior. Further, pumping water from the lake in the quantity necessary to meet MEP-I and MEP-II would not be feasible given the distance and head needed for a plant located a sufficient distance away from the lake.

[13] Excelsior's use of water obtained from mining pits will most always be outside the boundaries of the iron formation.

Native American Reservations

The Fond du Lac Indian Reservation located in the south-central-most part of the TTRA is considered an exclusion zone.

Search Area

Text boxes included on Figure 1 identify large areas of the TTRA that were excluded from consideration as Station sites due to a lack of existing rail service, their distance from existing track, their lack of sufficient transmission line corridors, the ubiquitous presence of wetlands, and/or their lack of sufficient water resources. These exclusions were discussed and justified in the preceding narrative of power plant siting considerations. The cross hatched area in the TTRA shown in Figure 1 (hereafter, the "Search Area") indicates where Excelsior focused its search for potential sites. The Search Area can, in general be described as an overlay of i) rail service and ii) water availability as described by being on the iron formation (i.e., able to be served by mine pit resources) or capable of being served by stretches of the St. Louis River showing evidence as having flow sufficient to satisfy the Station's requirements.

Figures 2 through 23 zoom into various locations within the Search Area to show the sites Excelsior identified as part of its initial screening efforts. In addition, these figures show areas throughout the Search Area that are located with the six-mile rail buffer area, but can be excluded from consideration as practicable alternatives for the IGCC Power Station. Exhibit 1 contains a narrative description for each figure, i) outlining the general location the figure occupies within the Search Area and ii) providing a general indication of why areas within each figure are not suitable for consideration as potential sites for the Station.

Initial Sites Selected

Excelsior initially identified 15 sites within the Search Area during the screening process; these sites are described individually in Exhibit 2. Table 4 cross-references the 15 sites selected with the figure number (i.e., Figures 2-23) within which each site appears.

Table 4. Excelsior Site/Figure Cross Reference List

Site No.	Site Name	Figure No.
1	Clinton Township South	12
2	Clinton Township East	11
3	Clinton Township West	11
4	Clinton Township North	11
5	Manganika Lake	11
6	West Aurora	10
7	Hoyt Lakes West	10
8	West Two Rivers Res.	8
9	East Range Site	10
10	Mountain Iron	8
11	Leonidas	11
12	Buhl	7
13	West Chisholm	7
14	Hibbing Industrial Park	7
15	West Range Site	3

Excelsior sought to minimize potential land-owner conflicts within the Search Area by focusing its

attention on finding large blocks of land i) not exclusively zoned for residential development[14] and ii) having relatively few land owners.

Step Three: Narrowing the Number of Potential Sites

Exhibit 2 is a site-by-site compilation of information on each of the 15 sites Excelsior considered as part of its initial screening process. Four of the 15 sites identified in Table 4 could easily be dismissed. Table 5 provides the basis for such decisions; see Exhibit 2 for a thorough analysis of the reason each of these sites could be quickly rejected.

Table 5. Initial Dismissal of Sites During the Screening Process

Site No.	Site Name	Rational for Dismissal
4	Clinton Township North	High proportion of wetland to upland areas.
8	West Two Rivers Res.	Property was considered unobtainable; reservoir and all its surrounding land owned by one industrial entity unwilling to provide access.
11	Leonidas	Constructability concerns[15] and pervasive wetland impacts.
12	Buhl	Constructability concerns and pervasive wetland impacts.

The information presented in Exhibit 2 contains the basis for narrowing the remaining 11 sites to the two sites considered to be practicable alternatives. Table 6 presents a summary of Excelsior's rationale for dismissing nine of the eleven remaining sites. The two practicable sites ultimately selected for use in the Power Plant Siting process are represented by the Preferred (Site No. 15) and Alternate (Site No. 9) sites, otherwise known as the West and East Range Sites, respectively.

Table 6. Dismissal of Sites During the Screening Process

Site No.	Site Name	Rationale for Dismissal
1	Clinton Township South	Water unavailable in quantities required year around; development constrained because of existing land owners, forcing expansion into areas where relatively high wetland impacts would occur.
2	Clinton Township East	Insufficient water supplies and wetland impacts associated with Phase I and Phase II developments due to avoidance of existing residential properties and industrial infrastructure.
3	Clinton Township West	Sufficient water supplies are not located close by and IGCC

[14] Although Minn. Stat. § 216E.10 ("Application To Local Regulation And Other State Permits") Subd. 1 ("Site or route permit prevails over local provisions") states that "the issuance of a site permit…shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government," by looking to locate in areas generally open to industrial development, Excelsior hoped to avoid serious land use conflicts.

[15] Significant portions of property are devoted to "mine dumps," that is, large piles of rocks of mixed size. Construction is difficult due to the inability to ascertain whether or not one has reached bedrock upon which to build foundations. See "Existing Industrial Facilities" under the section entitled "Step Two."

		Power Station developments would be constrained because of Station's proximity to nearby residents.
5	Manganika Lake	Water supplies sufficient to meet the total demand for the combined Phase I and Phase II developments are unproven; significant alteration of infrastructure surrounding the site would be required.
6	West Aurora	Water supplies sufficient to meet the total demand for the combined Phase I and Phase II developments are unproven; close proximity of site to local areas having relatively high residential density; insufficient area to accommodate IGCC Power Station developments.
7	Hoyt Lakes West	Site is partly located within the Mesabi Iron Range iron formation and may be subject to expanded mining operations.
10	Mountain Iron	Site is partly located within the Mesabi Iron Range iron formation and may be subject to expanded mining operations.
13	West Chisholm	Grade required to reach site is not suitable for rail access.
14	Hibbing Industrial Park	Site is currently committed by its owner, Iron Range Resources, to an alternative development plan.

The U.S. Army Corps of Engineers ("USACOE") has requested that Excelsior tabulate for each of the 15 sites the estimated wetlands impact of developing the IGCC Power Station. Excelsior has prepared Table 7 in response to the USACOE's request.

Table 7. NWI Wetland Analysis of Preliminary Sites Selected Under Excelsior's Screening Process

Alt. Site No.	Site Name	NWI Wetland Parcel No. 1 (Acres)	NWI Wetland Parcel No. 2 (Acres)	NWI Wetland Parcel No. 3 (Acres)	NWI Wetland Parcel No. 4 (Acres)	NWI Wetland Parcel No. 5 (Acres)	NWI Wetland Parcel No. 6 (Acres)	NWI Wetland Parcel No. 7 (Acres)	NWI Wetland Parcel No. 8 (Acres)	NWI Wetland Parcel No. 9 (Acres)	NWI Wetland Total Impacts (Acres)
1	Clinton Township S.	28.1	2.3	2.4							32.8
2	Clinton Township E.	0.7	10.9	7.4	5.4	8.9	5.0				38.4
3	Clinton Township W.	1.2	1.6								2.8
4	Clinton Township N.	30.6	9.9	52.0	0.8						93.3
5	Manganika L.	28.7	16.8								45.5
6	W. Aurora	18.4	3.3	1.1	3.7	0.6					27.1
7	Hoyt Lakes W.	10.1	5.1	1.5	2.6						19.3
8	W. Two Rivers Res.	35.0	6.4	6.1	1.4						48.8
9	Hoyt Lakes E. (East Range Site)	10.5	1.7	2.4							14.6
10	Mountain Iron	16.5	1.7	1.9	2.7						22.8
11	Leonidas	9.0	3. 6	2.7	2.7	8.6	1.0				27.6
12	Buhl	40.7	2.5	5.7	19.2						68.1
13	W. Chisholm	25.0	5.0	1.3	1.5						32.8
14	Hibbing Ind. Park	8.6	18.6	2.3	1.9	1.4	0.9	0.7	0.4	0.5	35.4
15	West Range Site	10.3	0.4								10.7

In assembling this information on wetland resource impacts, Excelsior used National Wetland Inventory ("NWI") database information prepared by the U.S. Fish and Wildlife Service from USGS 1:24,000 quadrangle maps.[16] In order to quantify relative wetland impacts on an equivalent basis, Excelsior used the footprint of the IGCC Power Station prepared by Flour (this is the same footprint that appears throughout the EIS) and rearranged it in one of four orthogonal directions (that is, at 0º, 90º, 180º, and 270º angles) thought to best accommodate the expected rail configuration. Figures 24 through 29 show the final configurations analyzed. Only Site No. 3 (Clinton Township West) is seen to have less of an impact on NWI wetlands than either the Preferred or Alternate sites (see Table 6 to see why Site No. 3 has been deemed impracticable).

The analysis presented in Table 7 considers only the area required to accommodate the Station footprint (approximately 180 acres in area for the two phase development). Further evaluations were precluded at this stage due to the detailed, case-by-case analysis required to i) correctly establish the grade and orient the rail spur required to reach the IGCC Power Station and ii) consider other infrastructure requirements.[17] Even so, the assessments should be considered indicative of the relative order of impacts that would be estimated if such further analyses were conducted (the configurations for the West and East Range Sites have been optimized to minimize impacts on wetland resources; by not taking advantage of such optimizations, the NWI figures shown in Table 7 for wetland impacts at these two sites are likely overestimated relative to the others).

A third site, the Hibbing Industrial Park, could be considered a practicable alternative, but an agreement between Iron Range Resources and a private developer precluded its consideration at this time.

Step Four: Final Evaluation of Practicable Alternatives

Excelsior further analyzed the two practicable alternatives identified above and the Hibbing Industrial Park, even though the Industrial Park site is not currently available for development.[18] Excelsior quantitatively ranked the three sites using its site selection criteria and the personal knowledge, judgment, and experience obtained from siting large power plants. The results of these evaluations and rankings were as follows:

1. West Range
2. Hibbing Industrial Park
3. East Range

The methodology consisted of aggregating the site evaluation criteria into the following eight categories:

- Licensability (the relative ease with which a site could be expected to be permitted considering all regulatory hurdles, such permits including, air, NPDES, water appropriation, etc.)

[16] *See* U.S. Fish & Wildlife Service web site at http://wetlandsfws.er.usgs.gov/NWI/download.html.
[17] Each site must accommodate a rail spur and loop, access roads for employees and construction vehicles, transmission line and natural gas pipeline interconnections, process water pipelines, and other utility connections.
[18] Excelsior also included three other currently impracticable alternatives in its analysis (the two industrial sites and the Mountain Iron site [Site No. 10]). The results of the six-site analysis are provided in Excelsior's Environmental Supplement at Section 1.13.1.3.

- Water Supply (quantity of water available and ease with which it could be obtained)
- Local community support (general support within the nearby community)
- Industrial Synergies (proximity to nearby industrial facilities capable of providing some synergy to MEP-I and MEP-II), and
- Transmission/Gas Supply (proximity of site to potential points of interconnection with the regional grid/gas supply lines)
- Local community support (general support within the nearby community)
- Dual Rail (capability to accommodate two rail suppliers providing service from their own track)
- Site Attributes (physical characteristics of site including topographical relief, wetland areas).
- Plant Expansion (capability of accommodating two phases of development)

A group of Excelsior employees that comprised the following disciplines were asked to produce a pairwise comparison of the above eight categories: environment, engineering, development, law, marketing, senior management, and operations. Each person compared each category to each of the other categories to establish the relative weights that each category would be given in the final site ranking analysis. The number of times a specific criterion was identified as being the most important in any pairwise comparison was totaled and divided by the total number of possibilities to establish such relative weights. Table 8 shows the weights assigned to each of the criterion.

Table 8. Weights Assigned to Site Evaluation Criteria By Excelsior Employees

Criterion	Relative Weight (%)
Licensability	20
Water Supply	19
Industrial Synergies	13
Transmission/Gas Supply	11
Local community support	10
Site Attributes	10
Dual Rail	9
Plant Expansion	8
Total	100

Each of the three sites identified above was assigned (by each employee participating in the ranking process) a score on a scale of 1 to 100 for each criterion provided in Table 8. The resulting scores were weighted by the factors provided in Table 8 and are provided in Table 9.

Table 9. Final Site Ranking by Excelsior Employees: Weighted Totals

Criterion	Site No. 15 (West Range Site)	Site No. 14 (Hibbing Ind. Park)	Site No. 9 (East Range Site)
Licensability	118	105	99
Water Supply	106	95	89
Industrial Synergies	12	38	49
Transmission/Gas Supply	57	54	43
Local community support	54	49	57
Site Attributes	55	52	52
Dual Rail	54	45	37
Plant Expansion	46	38	39
Total	**502**	**476**	**465**

Following the site ranking and evaluation, Excelsior proceeded to make its final selection of preferred and alternate sites. The two critical factors considered at this stage were site selection rank and the ability to obtain timely site control. The West Range Site ranked highest for these two factors and has been selected as Excelsior's preferred large electric power generating plant site for the following principal reasons:

- It received the highest ranking score in Excelsior's quantitative analysis.
- It lies outside the Lake Superior Basin watershed, thereby facilitating permitting and licensing.
- Plant make-up water is readily available from the Canisteo Mine Pit ("CMP") and Hill-Annex Mine Pit Complex. Overflow from these abandoned pits is a significant problem for local communities and the MDNR. Use of water from such pits provides a solution for the overflow problems. Alternative sources of water are also available to the West Range IGCC Power Station and in likely quantities to supply any shortfall that could be encountered in supplying Phase I and Phase II developments at the site via mine pit waters alone.
- The site is fairly remote, with only a small number of residential property owners potentially impacted, most of whom use the property on only a seasonal basis.
- The site is located in close proximity to adequately sized natural gas pipelines, existing HVTL corridors, and has the capability of being serviced by two rail providers.
- Excelsior has obtained an option to purchase the site, thereby providing immediate site control.
- Preliminary contacts with Itasca County, city officials from nearby communities, and the Itasca Development Council indicated broad support for the project.

The Hibbing Industrial Park site was originally considered as the alternative site because of the following advantages:

- The location is in an area that local communities have identified and set aside for industrial development. IRR and St. Louis County have also played important roles in assembling a land package of some 850 acres, with additional acreage appearing to be

readily available. Impacts on local residences are deemed manageable and local communities are supportive. Additionally, a new Central Range water treatment facility has been proposed for the area.

- Adequate make up water appears to exist in local mine pits.
- Although the site is located within the Lake Superior Basin watershed, it appears that the City of Hibbing's POTW may be of sufficient size to handle such discharges and therefore qualify for a variance from the rigid standards imposed on discharges of mercury by regulations implementing the Great Lakes Initiative.
- The site is located in relatively close proximity to two rail service providers, existing transmission line corridors, and a large industrial facility.

The Hibbing Industrial Park site is under the control of the IRR, but it was not available as a site for IGCC Power Station development. Therefore, the East Range Site was viewed as the best alternative site to evaluate under the Minnesota Power Plant Siting Act process. The rationale for utilizing the East Range Site as the alternate to the West Range Site included the following:

- IRR has secured through negotiation in the LTV bankruptcy proceeding (LTV was the original landowner of property now occupied by Cliffs-Erie ("CE")) an option to acquire land on LTV property near East Range. In a June 15, 2004 letter to U.S. Secretary of Energy Spencer Abraham, the Commissioner of IRR indicated that the agency would convey its option to Excelsior in support of the Mesaba Energy Project.
- Adequate make-up water appears to exist in local mine pits and other surface waters (i.e., Colby Lake and Whitewater Reservoir) in amounts sufficient to support Phase I and Phase II facilities.
- The closest residential neighbors are more than 0.5 miles from the site.
- The site provides ready access to infrastructure needed to support plant operations.

The East Range Site is considered to be less suitable than the West Range Site for the following reasons:

- The generator outlet HVTL facilities required are longer, the n-1 contingency dictates the use of two separate corridors, and more line losses occur over the increased distance.
- The site is within the Lake Superior Basin watershed and subject to regulations implementing the Great Lakes Initiative.
- The Hoyt Lakes POTW would require an expansion to accommodate discharges of cooling tower blowdown.
- Only one rail service provider appears to be feasible and the potential use of connected Lake Superior port appears costly and uncertain from an engineering perspective.
- The site is closer to Class I areas, thereby creating the potential for increased adverse impacts on air quality related values, including a predicted increase in visibility impacts.

USACOE Compliance Summary Matrix

Having identified the two practicable alternatives (i.e., the West and East Range Sites), Excelsior is required to assure that the site which is selected minimizes damages to the aquatic ecosystem and has no other significant adverse environmental effects. Following is a summary of the factors that bear upon this consideration.

Overcome USACOE's presumption that a practicable, less environmentally damaging alternative site, outside special aquatic sites, exists

This presumption is supported by the analysis outlined above in Figures 1-29, Exhibit 1, and in the Site Evaluation Forms contained in Exhibit 2. Combined, this evidence demonstrates that no practicable alternatives for siting the Phase I and Phase II developments of the Project can be found within the TTRA other than at the West and East Range Sites.

No alternative exists that is practicable, is less damaging to the aquatic ecosystem, and has no other significant environmental effects

Introduction

The purpose of this section is to identify and briefly differentiate between the environmental impacts expected to occur at the West vs. East Range Sites as a result of developing and operating the IGCC Power Station. A final determination as to which of the two sites represents the LEDPA will involve ongoing discussions about the valuation of various environmental attributes.

The differentiating factors between the environmental impacts at the two sites are focused on i) direct and indirect impact to aquatic ecosystems, ii) direct and indirect impacts to terrestrial ecosystems, iii) air emissions, including air quality related values in Class I areas, and iv) other environmental attributes, including but not limited to recreational opportunities, aesthetics, traffic, etc. Each of these principal factors will be discussed in the following subsections. A summary of the factors is tabulated at the end of this section. Additional details can be found in the Draft EIS and Excelsior's JA and Environmental Supplement ("ES").

The determination of which of the two sites represents the LEDPA would be based on the analyses contained in documentation prepared to satisfy the Federal NEPA and State site permitting processes, including, but not limited to, the Draft EIS, the public comments on the Draft EIS, and the Final EIS. The findings developed through this process would form the basis for that determination. The following discussion is intended to provide the basis for Excelsior's identification of the West Range site as the preferred alternative and further Excelsior's position that the West Range site is the LEDPA.

Aquatic Ecosystems: Wetlands

The West Range Site was estimated in the JA and ES to permanently impact a total of 172 acres; the East Range Site approximately 133 acres. These impacts assumed the total loss of wetlands within the rail loop at each site, a conservative, worst case assumption. However, since the JA and ES were published, the Nashwauk Public Utilities Commission (hereafter, the "Nashwauk PUC" or the "Utility") has indicated its intent to submit a natural gas pipeline route permit application to serve the Minnesota Steel Project ("MSP").[19] Construction of the pipeline by the Nashwauk PUC must be completed on an expedited schedule capable of providing the MSP a firm supply of natural gas by the end of 2008,[20] far in advance of the IGCC Power Station's start-up needs in 2010. Portions of the planned pipeline route for the IGCC Power Station could share common infrastructure with the route proposed for the MSP by the Nashwauk PUC thus

[19] *See* Minnesota Steel Draft EIS, Minnesota DNR and US Army Corps of Engineers, February 2007 § 6.13.2.4, page 6-48.
[20] *Ibid*, page 6-47.

reducing both environmental impacts and implementation costs.[21] Excelsior has expressed its willingness to cooperate with the Nashwauk PUC in order to facilitate the Utility's pipeline routing process. Given such cooperation, both Excelsior and the Nashwauk PUC presume that the MPUC will suggest the possibility of using one pipeline to serve both entities, an option that Excelsior acknowledged numerous times in its JA.[22] In Table 5.0-1 of the JA, Excelsior identified the specifications for a range of natural gas pipelines which it was considering to construct, the largest of which would be sufficient in size to handle the entire needs of the IGCC Power Station and the MSP.[23] If, in order to serve the MSP in a timely manner, the Nashwauk PUC obtains a natural gas pipeline route permit from the MPUC for a pipeline sufficient in size to serve the MSP and the IGCC Power Station, then Excelsior would seek to purchase its natural gas from the Utility under appropriate terms. In that instance, it becomes clear that the pipeline would have been constructed for the purpose of serving the MSP and that the wetland impacts must be assigned accordingly. This could potentially reduce the wetland impacts attributed to Excelsior at the West Range Site by up to the entire 17 acres noted in the JA, yielding a total permanent impact of 155 acres as compared to 133 acres for the East Range Site.

Aquatic Ecosystems: Habitat in Mine Pits Filled with Water

Operation of IGCC Power Station at the East Range Site would be expected to have a greater impact on aquatic resources established in these mine pits due to the wide swings in water levels that could be expected to occur when operating the Station at full capacity (such swings drawing the water level down to the extent made possible by the design of the cooling water intake structure). This has the potential to impact a significant portion of the aquatic habitats within the numerous pits affected. Although such impacts are not likely to occur simultaneously, nothing would prevent the circumstance from occurring repetitively in the same pit. The feasibility of operating the East Range Site mine pits in such fashion is that i) they are not classified by the MDNR as protected/public waters, ii) the owners of property surrounding the pits have denied the public access to them (the areas having largely been preserved for the benefit of economic development, i.e., mining), and iii) the MDNR has not undertaken efforts to stock fish in the pits.

The potentially affected mine pits and the associated areas now covered by water are identified in Table 10. Although no biological surveys are known to have been conducted in these pits, aquatic communities are likely to have been established through use by birds and amphibians.

[21] Ibid., § 6.13.3.2, page 6-51. Both Excelsior and the Nashwauk PUC presume that the MPUC will suggest that the two pipeline applications be combined to avoid the need for two natural gas pipelines.
[22] *See* Mesaba Energy Project, Mesaba One and Mesaba Two, Joint Application to the Minnesota Public Utilities Commission for the Following Pre-Construction Permits: Large Electric Power Generating Plant Site Permit, High Voltage Transmission Line Route Permit, and Natural Gas Pipeline Route Permit," June 16, 2006, § 1, page 1; § 1,4,1, page 15; § 1.9.3, page 34; § 2.5.4.1, page 84; and § 5, page 353.
[23] Ibid, § 5.1, page 355.

Table 10. Abandoned Mine Pit Water Sources on East Range Site

East Range Site Mine Pit Water Source	Bottom Elevation[1] (feet)	Water Surface Elevation[2] (feet) (November 2005)	Estimated Surface Area (acres) (November 2005)	Estimated Volume (acre-ft) (November 2005)
2E	1,427	1,492.2	84	1,700
2W	1,282	1,413	183	13,430
2WX	1,331	1,405.4	322	8,880
6	1,276	1,426.6	207	18,850
3	1,522	1,586.7	82[4]	Not Available
5N	Not Available			
5S				
9 / Donora	1,493	1,547.2	221[4]	Not Available
9S	1,396	1,475.2	34[4]	
Stephens	1,377	Not Available	246[4]	
Knox	1,362		39[4]	

1) Bottom elevations are based on blast maps and aerial contour mapping provided by Cliffs-Erie.
2) Water surface elevations are based on field surveys provided by Cliffs-Erie.
3) Surface area and estimated volumes were obtained from the MDNR March, 2004 East Range Hydrology Report.
4) Surface area estimated from 2003 aerial photographs.

Conversely, the MDNR considers the CMP (serving the West Range Site) a recreational resource. In recognition of this, Excelsior's application for a water appropriation permit to the MDNR acknowledges the Company's intent to operate the CMP so as to maintain its water levels within a specific range. The change in water elevation within the Hill-Annex Mine Pit Complex will be subject to a more dramatic change in water elevation, but such lowering will be conducted in a manner to expose historical mining operations and will serve to benefit the purpose of Hill-Annex State Park.

Aquatic Ecosystems: Direct Impacts of Wastewater Discharges

No wastewater discharges associated with the gasification island or the power block will be released to surface waters on the East Range Site. This site is within the Lake Superior Basin where stringent water quality criteria have been established as part of the Great Lakes Initiative ("GLI") that includes a ban on mixing zones for bioaccumulative chemicals of concern (mercury, a trace element found in Minnesota surface waters is designated as such).[24] Given this ban, Excelsior would find it difficult to reduce concentrations of mercury in its cooling tower blowdown ("CTB") to levels below the 1.3 nanogram per liter GLI water quality criterion.[25]

The IGCC Power Station on the West Range Site will be required to obtain a National Pollutant Discharge Elimination System ("NPDES") permit prior to initiating construction. This pre-

[24] *See* http://www.epa.gov/waterscience/gli/mixingzones/.
[25] The mercury concentrations in Pits No. 6 and 2WX on the East Range Site have been measured and found to vary between 0.6 and 1.1 nanograms per liter. The cooling towers would evaporate water obtained from these East Range Site mine pits, thereby concentrating – in about two cycles of concentration or less – the mercury present in the raw cooling water supply above the GLI water quality criteria of 1.3 nanograms mercury per liter.

construction permit will contain conditions designed to prevent adverse impacts to aquatic resources from the Project's proposed discharge of CTB. Categorical standards have been promulgated by the U.S. Environmental Protection Agency ("USEPA") for CTB releases from steam electric generating units.[26] These standards are periodically reviewed and subject to revision.[27] The permit issued for construction of Mesaba One and Mesaba Two will contain provisions derived from the study of many facilities with CTB releases. Cooling tower blowdown from the power block of Mesaba One and Mesaba Two will resemble the cooling tower blowdown from a natural gas combined cycle generating plant (the specific chemistry of the releases being largely dependent upon the chemistry of the source from which the cooling water is taken). A recent permit drafted for a 1,200 MW natural gas-fired combined cycle plant in Illinois indicates the simple conditions attached to systems releasing CTB as their only discharge[28] relative to conditions applied to a large coal-fired power plant discharging process waters coming in contact with combustion by-products.[29]

While Excelsior believes the scenario established in the EIS, Joint Application and NPDES Permit Application is consistent with rules governing the NPDES permit program, outside of circumstances constituting extreme drought, the company will seek to avoid discharge of any CTB to the CMP. Excelsior's focus will be to divert the entire CTB discharge to Holman Lake, while providing offsetting benefits via other projects in the immediate vicinity (see the following section entitled "Aquatic Ecosystems: Indirect Benefits Accompanying West Range Site Development").

Aquatic Ecosystems: Indirect Benefits Accompanying West Range Site Development

Significant positive contributions to aquatic ecosystems will result from the following actions stemming from development of the IGCC Power Station at the West Range Site:

- Reducing inflow and infiltration to the regional waste water treatment plant lift station that currently overflows to Trout Lake during conditions of high precipitation;
- Eliminating the threat of flooding for the CMP that would cause significant degradation of Trout Lake waters;
- Reducing the flow of water from Panasa Lake to the Swan River (a navigable water that is impaired for dissolved oxygen); and
- Preventing water from Trout Lake that may be high in phosphorus and other contaminants associated with historical mining practices from entering into the Swan River as a result of the proposed siphoning of CMP waters.

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[26] U.S. EPA. 1974. Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Steam Electric Power Generating Point Source Category. Washington, DC. (October). U.S. EPA. 1982. Development Document for Effluent Limitations Guidelines and Standards and Pretreatment Standards for the Steam Electric Point Source Category. EPA-440-1-82-029. Washington, DC. (November).

[27] U.S. EPA. 1989. Memorandum to Regional Permit Branch Chiefs and State Directors. "Combined Cycle Electric Generation Plants – Steam Electric Power Generating Point Source Category." (19 December). DCN 01574. U.S. EPA. 1996. *Preliminary Data Summary for the Steam Electric Point Source Category.* EPA 821-Z-96-010. Washington, DC. (April). DCN 00610. U.S. EPA. 1997. *Profile of the Fossil Fuel Electric Power Generation Industry*. EPA/310-R-97-007. Washington, DC. (September). Available online at: http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/fossil.html. U.S. EPA. 2005b. *Preliminary Engineering Report: Steam Electric Detailed Study*. EPA 821-B-05-005. Washington, DC. (August). Available online at: http://www.epa.gov/waterscience/guide/304m/report_steam_electric.pdf.

[28] *See* http://www.epa.state.il.us/public-notices/2006/invenergy-nelson/index.pdf for the Nelson Energy Center, an existing 1,200 MW natural gas-fired combined cycle power station. The draft permit is 9 pages long.

[29] *See* http://cfpub.epa.gov/npdes/permitissuance/genpermits.cfm for the Eastlake Power Station (an existing coal-fired power station discharging to Lake Erie); the permit is 45 pages long.

Terrestrial Ecosystems: Direct Impacts to Forestland

The West Range Site was estimated in the JA to permanently impact a total of 456 acres of forestland; the East Range Site approximately 294 acres. However, assigning the impacts associated with the natural gas pipeline to the Project on the West Range Site may be unwarranted. As noted above, it now appears that the natural gas pipeline may be constructed by the Nashwauk PUC to serve the Minnesota Steel Project. To avoid double-counting the forestland impacts required for the new natural gas pipeline, the total permanent impacts assigned to the West Range Site may ultimately be reduced by 63 acres (yielding a total permanent impact of 392 acres). Conversely, no forestland impacts were assigned to the natural gas pipeline associated with the East Range Site. This also, in hindsight, may have been inappropriate. Even though the natural gas pipeline on the East Range Site will be constructed and owned by an entity other than Excelsior (in this case, Northern Natural Gas or "NNG"), the pipeline would be constructed for the sole benefit of the Mesaba Energy Project. To construct the natural gas pipeline to serve the East Range Site, NNG would be required to acquire approximately 132 acres of forestland resulting in a total permanent East Range Site impact of 426 acres (294 acres + 132 acres, or approximately 34 acres in excess of that required for the West Range Site).

It is important to distinguish the two scenarios in the preceding paragraph from one another. Although both pipelines will be built by entities other than Excelsior, in the case of the West Range Site, the non-Excelsior entity will be building the pipeline to serve Minnesota Steel; on the East Range Site, the non-Excelsior entity will be building the pipeline to serve the Mesaba Energy Project. Therefore, the assignment of forestland impacts to the Mesaba Project in one instance (East Range Site) and not the other (West Range Site) would not be inconsistent.

Terrestrial Ecosystems: Indirect Impacts Due to Losses Via Solid Waste Disposal

At the West Range Site, Mesaba One and Mesaba Two would generate approximately 4,400 tons per year of hazardous waste from operation of its zero liquid discharge ("ZLD") system; at the East Range Site, the ZLD system would generate up to an additional 24,000 tons per year of solid waste that would require disposal in a non-hazardous waste landfill.[30] The special treatment of cooling tower blowdown at the East Range IGCC Power Station is explained in the section above entitled "Wastewater Discharges: Direct."

Air Emissions: Direct Impacts

The expanded ZLD system required to eliminate cooling tower blowdown at the East Range Site will reduce the electrical output of Mesaba One and Mesaba Two. In addition, the longer HVTLs required to interconnect the IGCC Power Station with the Forbes Substation result in greater line losses. In all, the net effect of the increased auxiliary power consumption and the HVTL losses is expected to reduce i) the efficiency of the Station and ii) the total electrical capacity delivered to the grid by about 9 MW. This loss in baseload output capacity would be expected to be generated elsewhere (that is, if the power is needed, some other power plant(s) will generate it). At times of peak demand, older and less controlled power plants are likely to be called upon to make up for the reduced power output. Excelsior has evaluated the air-emission impacts of the reduced efficiency and electrical output by assuming that replacement power will come from a power plant having the same emission rates as Mesaba One and Mesaba Two. The "excess

[30] The ZLD system on the West Range Site will function to eliminate the discharge of any water contacting the feedstock consumed or the syngas generated. The ZLD system on the East Range Site would eliminate the wastewater generated from contact with syngas and, in addition, the release of cooling tower blowdown.

emissions" attending the East Range Site scenario are as follows: 11.5 tons/yr of sulfur dioxide ("SO_2"), 23.8 tons/yr of nitrogen oxides ("NO_X"), and about 44,000 tons/yr of carbon dioxide ("CO_2"). The increased level of total dissolved solids found in the mine pits on the East Range Site would be the source of additional PM_{10} emissions associated with the drift from the cooling towers. This amounts to an increase of 215 tons/yr (an approximate increase of 44% relative to the West Range IGCC Power Station).

Air Emissions: Indirect Impacts

Unit coal trains must travel increased distances from western coal fields to reach the East Range Site. Provided the water level in the CMP is lowered and the rail line along it is stabilized, the added one way distance trains would have to travel to the East Range Site would be approximately 60-65 miles. If the rail line along the CMP is not stabilized, the added one way distance would approximate 200 miles (trains would be required to go from Gunn to Superior, Wisconsin and then to Hoyt Lakes). In either case, the added distance results in excess air emissions from locomotives, increased grade crossings, and more people affected by noise and traffic.

Air Emissions: Direct Impacts on Air Quality Related Values

The closer proximity of the East Range Site to the Boundary Waters Canoe Area Wilderness ("BWCAW") and Voyageurs' National Park ("VNP") causes a substantive increase in the number of events where modeled visibility impacts resulting from Mesaba One and Mesaba Two occur above the Federal Land Managers' ("FLMs") threshold levels of concern (namely 5% and 10% visibility reduction). For the three years of meteorological data considered, the modeled number of events at the East Rate Site above the 5% visibility reduction threshold was more than five times the number modeled for the West Range Site; the number of events above the 10% threshold modeled for the East Range Site was ten times the number modeled for the West Range Site. Although the modeling protocol used by the FLMs to assess visibility impacts in Class I areas is known to over predict the actual visibility impacts, the dramatic increase in the number of events above the thresholds at the East Range Site suggests the relative level of impacts expected.

Other Environmental Attributes: Impacts

The people affected by Mesaba One and Mesaba Two will be comprised of people living near i) the plant footprint, ii) the rail line over which unit coal trains will pass, iii) HVTLs interconnecting the IGCC Power Station to the regional electric grid, iv) the natural gas pipeline, v) process water supply and blowdown pipelines, and vi) utilities providing interconnection to municipal services. Table 11 is provided to summarize the numbers of residents living near infrastructure associated with the Mesaba Energy Project. Additional, unquantified impacts would relate to the added number of grade crossings encountered between the West and East Range Sites and the added emissions due to the longer distance traveled by unit coal trains.

Table 11. Quantitative Comparison of Environmental-Related Attributes: West vs. East Range Sites

Description of Residents within Specified Distance of Project Element	West Range Site	East Range Site

One mile of Power Station Footprint	46	1
One-half mile of HVTL	66	1,233
500 ft of natural gas pipeline	17	87
500 ft of process water & blowdown pipelines	6	0
One-quarter mile of rail line near plant spur	10	0

The number of residents along the HVTLs on the East Range Site is of particular concern given the HVTLs proximity to the Eveleth-Virginia Municipal Airport and the Sky Harbor Airport (deemed a Seaplane Base). Not only will those residents be subject to the visible disturbance of taller HVTL structures, due to the proximity of the airports the HVTL towers may be required to be fit with obstruction lighting. As noted in the ES, this aesthetic impact would be new and visible over significant distances.[31]

HVTL impacts associated with network reinforcements required to ensure that power from Mesaba One and Mesaba Two will be deliverable to the MISO footprint will be determined through the MISO Large Generator Interconnection Procedure.[32] The outcome of this procedure will be influenced by, among other things, projects seeking to expand their existing transmission systems and the success of nearby projects requiring large amounts of power (for example, on the West Range Site, the success of the Minnesota Steel Project would be expected to significantly reduce the network reinforcements required due to the proximity of Mesaba One and Mesaba Two to the Minnesota Steel footprint). The studies being conducted by MISO to evaluate Mesaba One and Mesaba Two will be proceeding in parallel with the environmental review process. The outcome of the MISO process cannot be presupposed.

Discharge must not violate state water quality standards or CWA § 307 toxic effluent standards or bans

Excelsior may be required to obtain a variance for discharging cooling tower blowdown into Holman Lake and the CMP, but only for hardness and total dissolved solids, two parameters that do not represent issues directly related to public health and welfare nor aquatic ecology. As previously noted, Excelsior must obtain preconstruction permits, the conditions of which will be designed to preclude operations that would cause adverse environment impacts. No toxic effluents will be released from the West Range IGCC Power Station in amounts that would violate CWA § 307 as cooling tower blowdown is effectively the only discharge to West Range receiving waters.

The Mesaba Energy Project at either site will be in compliance with the minimum treatment provisions defined at Minn. R. 7050.0185 ("Nondegradation For All Waters") Subp. 3 ("Minimal treatment") in that the project will comply with applicable effluent limitations and water quality standards of this chapter and shall maintain all existing, beneficial uses in the receiving waters. Using the criteria identified in Minn. R. 7050.0185 Subp. 4 ("Additional

[31] *See* Mesaba Energy Project, Environmental Supplement, June 16, 2006, it, High Voltage Transmission Line Route Permit, and Natural Gas Pipeline Route Permit," § 1, page 1; § 1,4,1, page 15; § 1.9.3, page 34; § 2.5.4.1, page 84; and § 5, page 353.
[31] Ibid, § 5.1, page 355.
[32] *See* http://www.midwestiso.org/page/Large%20Generator for an explanation of the procedure's various steps.

requirements for significant discharges") additional treatment such as the use of ZLD on the West Range Site to eliminate the discharge of cooling tower blowdown is not required to minimize the impact of the discharge on the receiving water (as noted in Subpart 4, the MPCA "shall consider the importance of economic and social development impacts of the project, the impact of the discharge on the quality of the receiving water, the characteristics of the receiving water, the cumulative impacts of all new or expanded discharges on the receiving water, the costs of additional treatment beyond what is required in subpart 3, and other matters as shall be brought to the agency's attention," the combination of which will support Project as now planned). Excelsior has submitted in the JA and ES information to satisfy the requirements under Minn. R. 7050.0185 Subpart 8 ("Determination of reasonable control measures for significant discharges") which includes information regarding the i) positive socioeconomic impacts of the Project, ii) the fact that the Project is employing ZLD to eliminate any discharge of contact cooling/process water, iii) the fact that the only significant use of Holman Lake is for swimming, iv) the fact that the CMP is not on the state's Protected Waters and Wetlands Inventory, v) the fact that no residential dwellings are currently located on Holman Lake or the CMP, vi) the current designation of Holman Lake, vii) the added impact of having to landfill additional salts if the ZLD system was expanded to eliminate CTB, etc.

Project must not jeopardize the continued existence of an endangered species

The U.S. Department of Energy has requested the U.S. Fish & Wildlife Service conduct a Section 7 consultation to confirm the Project is not likely to adversely affect threatened or endangered species or their critical habitats. At this time, there is no indication that either of the two practicable alternatives would be likely to create such adverse impacts.

Must not cause significant adverse effects ("MNCSAE") on municipal water supplies, plankton, fish, shellfish, wildlife, special aquatic sites or other aspects of human health or welfare

All of the mine pits are surface waters that could potentially have some interconnection to the nearby municipal wells through groundwater. The mine pits located on the East Range Site will not receive any discharge from the IGCC Power Station. As previously noted, Excelsior's intent is to eliminate any discharge of CTB to the CMP except under the circumstance of extreme drought. Given this intent, neither the West nor East Range IGCC Power Stations would be expected to have impacts on municipal water supplies.

The Minnesota Department of Health, under the Wellhead Protection Program established by the 1986 Amendments to the Safe Drinking Water Act (*see* 42 U.S.C.A. § 300h-7) is currently conducting an analysis of the wellhead protection zone for local communities around the CMP. Although not complete at this time, preliminary findings from these studies indicate that as the level in the CMP drops below 1,300 ft MSL, the municipal wells close to the pit fall outside of the 10 year wellhead protection zone (currently levels in the Canisteo Mine Pit are above 1,300 ft MSL and at such levels the CMP falls within the wellhead protection zone).[33] In its Water Appropriation Permit Application to the Minnesota Department of Natural Resources, Excelsior has indicated its appropriation of water from the CMP would lower levels therein to between 1260 and 1290 ft MSL with i) the exception of periods of drought when the lower level could

[33] Personal Communication, James Walsh, Minnesota Department of Health, February 23, 2007.

reach 1250 ft MSL and ii) during extremely wet periods when the upper level could range between 1290 – 1300 ft MSL (see page 26 of the Water Appropriation Permit Application). Even though a drop in water level in the Canisteo Mine Pit would lengthen the travel time to nearby municipal wells so that such wells were outside the 10 year wellhead protection zone, it would not preclude water from the CMP from impacting such wells at some point in the future beyond the 10 year travel time.

By reducing levels of water in the CMP and thereby increasing the time it takes for such waters to reach nearby municipal water wells, the West Range IGCC Power Station is expected to positively benefit nearby municipal water supplies by reducing the potential impact of the CMP on groundwater quality (the longer it takes for CMP water to reach a municipal well, the greater the opportunity for "natural" groundwater to dilute it).

No municipal wells are located within at least two miles of any point downstream of Holman Lake for a distance of greater than 16 river-miles. The first municipal well within that distance is the municipal well for Warba, located approximately ¼ to ½ miles due west of the Swan River.[34] No impact on the Warba municipal well(s) are to be expected at this distance downstream of the point where Holman Lake empties into the Swan River.

MNCSAE on life stages of aquatic life and other wildlife dependent on aquatic ecosystems and MNCSAE on ecosystem diversity, productivity, or stability

The wide swings in water levels that could occur at the East Range Site would be expected to have a greater adverse effect on life stages of aquatic life than at the West Range Site (i.e., if the IGCC Power Station was required to completely drain one of the mine pits on the East Range site, any aquatic life therein would be damaged).

At the West Range Site, when operating at five cycles of concentration in the cooling tower, the concentration of sulfate in CTB discharged from Mesaba One and Mesaba Two is expected to be approximately 50 times higher than the current concentration in Holman Lake (the sulfate concentration in CTB is expected to be between 450 and 500 mg/liter and the concentration in Holman Lake is 10 mg/liter). The concentration of sulfate within Holman Lake is expected to range between 200 to 300 mg/liter.

Concern has been raised by the MPCA regarding the relationship between sulfate and the generation of methyl mercury in aquatic environments.[35] However, while it has been demonstrated that the addition of sulfate may stimulate the formation of methyl mercury in peatlands,[36] the relationship may depend on several variables in addition to sulfate. These

[34] See MDNR website at http://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/wateruse.html for ArcView shape files contained in avswuds.zip contains active water appropriation permits that including active municipal wells.

[35] May 4, 2006 letter from Minnesota Pollution Control Agency (Richard Sandberg, Manager, Air Quality Permits Section, Industrial Division) to Minnesota Department of Commerce (William Storm, Energy Facility Permitting), page 4. In the letter, the MPCA indicates that increases in sulfate in certain aquatic environments can contribute to the formation of methylmercury in receiving waters.

[36] Branfireun BA, Roulet NT, Kelly CA & Rudd JWM (1999) In situ sulphate stimulation of mercury methylation in a boreal peatland: toward a link between acid rain and methylmercury contamination in remote environments. Global Geochemical Cycles 13: 743-750. Branfireun BA, Bishop K, Roulet NT, Granberg G & Nilsson M (2001)

include organic carbon, the fraction of bioavailable mercury, the presence of adjacent wetlands and peat bogs in particular, and the microbial community structure (not all sulfate reducing bacteria methylate mercury).[37] The monitoring to be conducted to confirm whether or not the water quality criterion for mercury must be lowered from the current 6.9 ng/liter standard in order to avoid adverse impacts, will be the subject of the National Pollutant Discharge Elimination System permitting process.

MNCSAE on recreational, aesthetic or economic values

Although Excelsior has requested that access to the CMP be closed for safety, security and operational purposes, such action is not expected to have a significant adverse impact on recreational values in an area having a plethora of lakes. No significant adverse effects on recreation are expected on the East Range Site.

Other than the visual impacts identified under "Other Environmental Attributes: Impacts" regarding obstruction lighting that may be placed on sections of HVTLs (see page 27), asethetic impacts are expected to be similar on both sites in that plant features (new stacks, cooling tower plumes, night lighting, etc.) and ongoing activities (rail deliveries, traffic, noise, etc.) at the Mesaba One and Mesaba Two footprint will be observable by the public. Noises above Minnesota daytime and nighttime standards will be required to be mitigated to acceptable levels. As residents that live around the West Range Site are currently exposed to road noise from County Road 7 that is above the nighttime noise standards, more mitigation is likely to be required on the West Range Site than on the East Range Site. However, mitigation at both sites is expected to eliminate adverse noise impacts.

The impact on existing economic values at both sites is expected to be positive under all circumstances outside of impacts to residents living closest to the rail lines and HVTLs. Since the HVTLs for the West Range are shorter and less people are affected, the representative impacts are expected to be greater for the East Range Site.

All appropriate and practicable steps taken to minimize adverse impacts

See discussion under the section titled "Discharge must not violate state water quality standards or CWA § 307 toxic effluent standards or bans" to demonstrate that all appropriate and practicable steps have been taken to minimize adverse impacts at both sites. The IGCC Power Station at either the West Range or the East Range Sites will be the cleanest coal fueled power plant operating in Minnesota and cleaner than any other existing coal-fueled power plant in the entire nation.

Summary Table

Parameter	West Range	East Range

Mercury cycling in boreal ecosystems: The long-term effect of acid rain constituents on peatland pore water methylmercury concentrations. Geophys. Res. Lett. 28: 1227-1230.

[37] Macalady JL, Mack EE & Scow KM (2000) Sediment Microbial Community Structure and Mercury Methylation in Mercury-Polluted Clear Lake, California. Appl. Environ. Microbiol. 66: 1479. Porvari P & Verta M (1995) Methylmercury production In flooded soils - a laboratory study. Water, Air, and Soil Poll. 80: 765-773.

Direct Wetland Impacts	155-172 acres	133 acres
Mine Pits Within Which Levels are Expected to Fluctuate Widely	0	11 (>1418 acres)
Wastewater Discharges	Cooling tower blowdown only; many positive accompanying actions	Full zero liquid discharge
Direct Forestland Impacts	329-456 acres	294-426 acres
Hazardous Waste/Solid Waste (HW/SW) Landfilled	4,400 tons/yr (HW)	4,400 tons/yr (HW) <24,000 tons/yr (SW)
Excess SO_2 Emissions	Baseline	11.5 tons/yr
Excess NO_X Emissions	Baseline	23.8 tons/yr
Excess PM_{10} Emissions	Baseline	215 tons/yr
Excess CO_2 Emissions	Baseline	44,000 tons/yr
Additional Rail Miles	Baseline	65-200 miles/delivery (one-way)
Days of >5% Visibility Impairment in Class I Area	Baseline	5 times West Range
Days of >10% Visibility Impairment in Class I Area	Baseline	10 times West Range
Receptors near Plant Site and Infrastructure	145	1,321

Conclusion

Based on the foregoing, the universe of practicable alternatives for the construction of Mesaba One and Two is limited to the West and East Range Sites. Furthermore, the considerations discussed above (some of which are more fully described in the Draft EIS and Excelsior's JA and ES) set forth the basis on which Excelsior has concluded that the West Range Site constitutes the LEDPA.[38]

[38] This discussion has been limited to environmental considerations and does not also address the significant economic benefits accompanying a decision to locate at the West Range Site vs. the East Range Site that would be in the interest of electric ratepayers.

Figures 1-29

See accompanying narrative in Exhibit I

Exhibit 1: Narrative for Figures

Narrative for Figures 1-23

Figure 1: An overview of the TTRA showing the area within which Excelsior's search for practicable alternatives for siting Mesaba One and Mesaba Two was focused. The cross hatched region generally represented areas within the TTRA where access to sufficient water supplies were available, where access to existing rail tracks and HVTL corridors were feasible, and where impacts to wetlands could be minimized.

Figure 2: The western-most portion of the TTRA, in the vicinity of La Prairie and Coleraine, MN, is highly residential and generally unsuitable for siting a large power plant. Only one location appeared to have some potential for low wetland impacts, but the plat map revealed that no large blocks of land were available there, and the close proximity to resort homes on Trout Lake pose insurmountable issues precluding further consideration of the site.

Figure 3: To the east, the next portion of the TTRA, between Coleraine and Pengilly, MN, contains a number of promising-looking sites, but only the preferred West Range site is worthy of further consideration. To the west of that site, the unfavorable topography and the difficulty of routing rail access around the Canisteo Mine Pit eliminates that area from consideration. The area to the east of the preferred West Range site is owned and proposed for use by another industrial entity. The region south of US-169 is covered with lakes and wetlands, and the three areas identified are of insufficient size to site a power plant without having significant wetland impacts.

Figure 4: The portion of the TTRA between Pengilly, MN and Keewatin, MN is much like the previous region. The area north of US-169 is owned and proposed for use by another industrial entity. The region south of US-169 is covered with lakes and wetlands, and is also owned and used by other industrial entities.

Figure 5: The portion of the TTRA between Keewatin, MN and Hibbing, MN is much like the previous region. Nearly the entire area is owned and used by other industrial entities.

Figure 6: The portion of the TTRA just south of Hibbing, MN is dominated by wetlands. The only area that appears to have less wetland is residential and lacks large blocks of available land, making it unsuitable for siting a power plant.

Figure 7: The portion of the TTRA in the vicinity of Chisholm, MN and Buhl, MN contains three of the alternative sites identified in the site selection process. Aside from those areas, the Iron Formation precludes development in much of the region. The area northeast of Chisholm appears promising, but GIS software does not reflect that the nearby rail line has since been removed, rendering that location beyond all the three mile rail line buffers.

Figure 8: The portion of the TTRA between Kinney, MN and Virginia, MN contains two of the alternative sites identified in the site selection process. Aside from those areas, the Iron Formation precludes development in much of the region. Otherwise, the region north of Virginia is largely controlled and used by industrial entities, but the availability of water is unlikely to be

sufficient anyway. The plat map reveals that the area southeast of Kinney contains no large blocks of land suitable for siting a power plant.

Figure 9: The portion of the TTRA between Virginia, MN and Biwabik, MN is dominated by the Iron Formation. Otherwise, the area just west of Gilbert is controlled and used by an industrial entity. East of Gilbert, water availability to the north of the Iron Formation is insufficient for siting a power plant, and the region south of the Iron Formation is dominated by wetlands and residential developments, leaving no areas suitable for power plant siting.

Figure 10: The portion of the TTRA between Biwabik, MN and Hoyt Lakes, MN contains three of the alternative sites identified in the site selection process, including the alternative East Range site. Aside from these sites, the region is dominated by the Iron Formation, residential development, and wetlands that preclude any other sites from being considered. East of Hoyt Lakes, water availability is insufficient for siting a power plant.

Figure 11: The portion of the TTRA in the vicinity of Eveleth and Leonidas, MN contains five of the alternative sites identified in the site selection process. Outside of these locations, the region is dominated by the Iron Formation, residential development and wetlands, which preclude any other sites from being considered for siting a power plant.

Figure 12: The portion of the TTRA in the vicinity of Forbes, MN contains one of the alternative sites identified in the site selection process. Aside from this location, the region is dominated by wetlands and residential development, which preclude other sites from being considered for siting a power plant. The plat map revealed that the area southwest of Forbes and southeast of the St. Louis River contained no large blocks of available land.

Figures 13-18: The large southern portion of the TTRA along the DMIR and DWP rail lines contains vast amounts of wetlands, while generally lacking sufficient water availability for siting a power plant. The few areas with less wetland area lack large blocks of available land.

Figure 19: The southern-most portion of the TTRA in the vicinity of Brookston, MN is dominated by wetlands and residential development. South of the St. Louis River, the Fon du Lac Reservation would complicate power plant siting beyond the issues cited above. The area north of the confluence of the St. Louis and Cloquet rivers would result in significant wetland impacts, due to rail access and because aesthetic considerations would force some setback from the river.

Figure 20: The southwestern-most portion of the TTRA to the west of Brookston, MN contains significant residential development and no large blocks of available land suitable for siting a power plant.

Figure 21: The small portion of the TTRA near Swan River, MN contains significant wetlands, residential development and no large blocks of available land suitable for siting a power plant.

Figure 22: The portion of the TTRA along the BNSF rail near Casco, MN is dominated by wetlands. The two areas with less wetland are either controlled by another industrial entity or lack large blocks of available land.

Figure 23: The portion of the TTRA east of Hibbing and south of Buhl, MN contains two of the alternative sites identified in the site selection process. Aside from these locations, the region is dominated by residential development and wetlands, and sufficient water availability is unlikely.

Narrative for Figures 24-29

Figures 24 through 29 illustrate how Excelsior screened alternative site locations for wetland impacts using the IGCC Power Station footprint and National Wetland Inventory maps. The results of this screening analysis are presented in Table 7. The methodology used in the screening analysis is presented in the text immediately following that table.

Exhibit 2: Site Evaluation Sheets

Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.:	1	Site Name:	Clinton Township South	T:	57N	R:	18W	Section:	25/36	Acres: ~380	
Rail Provider:	☐ BN	☒ CN	☐ Other	Distance (mi):	BN +12	CN: OS	Other:				
Rail Discussion: Significant wetland and residential areas between BN & CN rail tracks; link between the two systems is unlikely											
Other Transportation:	Good access via US Highway 53 and CR 37										
Water Supply:	Long Lake and St. Louis River										
Water Supply Discussion: Significant periods of low flow occur in St. Louis River occur at Forbes; Long Lake is relatively small and its shoreline occupied by numerous residential dwellings											
HVTL:	☒ 115 kV	☐ 230 kV	☐ Other	Line Nos.:	MP 16L, 38L, 39L						
HVTL Discussion: Numerous lines; very close to Forbes Substation											

General Description

Site is in good location with no topographical constraints; close to HVTL & roads; ~38 miles from BWCA; ~64 miles from VNP. Site has numerous wetland areas and residences that constrain development. Site located in Lake Superior Basin. See Figure 24 for an illustration of how this site would fit into the surrounding area.

Exclusions

Site Selection Criteria			Practicability
☒ Permitting	☒ Technical	☐ Site Control	☐ Cost ☐ Technology ☐ Logistics
P5, P6	T1, T2		

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Combination of wetland area impacts and insufficient water supply to support Phase I and Phase II developments.
Technical	Configuration of plant site & rail loop would be constrained by wetlands and nearby land owners.
Site Control	

NWI Wetland Impacts

Approximately 33 acres of NWI wetlands affected by IGCC Power Station footprint; 44% of site occupied by NWI wetlands.

Quantitative Analysis

The St. Louis River and Long Lake are classified as "waters of the United States." New facilities (as defined at 40 CFR 125.83) locating on such waters and i) withdrawing more than 2 million gallons per day, ii) using more than 25% of that volume for cooling purposes, and iii) using a cooling water intake structure ("CWIS") to divert such volumes of water to the source are restricted as to the amount of water that can be withdrawn from such waters. Since the Mesaba Energy Project would be a new facility and would meet these criteria it would be subject to rules governing cooling water intake structures (see 66 FR 65256). Such rules restrict the amount of water that can be withdrawn from freshwater rivers, streams, lakes and reservoirs. Withdrawals from freshwater rivers or streams must be no greater than 5 percent of the source waterbody mean annual flow; withdrawals from a lake or reservoir must not disrupt the natural thermal stratification or turnover pattern (except where such disruptions are determined to be beneficial to the management of fisheries). At 40 CFR 125.84(e), the final rule governing CWISs recognizes that a State may include more stringent requirements to the location, design, construction and capacity of a CWIS at a new facility.

The USGS formerly operated from August 1964 through March 1990 a gauging station on the St. Louis River near Forbes (the daily flows measured at the gauging station are provided at the following web site: http://www.rsi.mtu.edu/rsidata/superior_watershed/minnesota/daily/04018750.txt. Analyzing this dataset shows the mean annual flow rate at this location to vary between 313 to 782 ft^3/sec with four years where the annual mean flow was less than 400 ft^3/sec (313, 325, 345, and 387 ft^3/sec). The historical data set shows 200 days where flow was less than or equal to 40 ft^3/sec and USGS has computed the 7Q10 flow to be 45.1 ft^3/sec. In the proposed rules, the maximum amount of water that could be withdrawn from a river was 25 percent of the 7Q10 (11.28 ft^3/sec or 5,060 gallons per minute) or 5 percent of the mean annual flow (15.65 ft^3/sec or 7,025 gallons per minute), whichever was lower. The annual average appropriation of water from Mesaba One and Mesaba Two on the West Range Site is expected to range from 8,800 to 10.300 gallons per minute (19.6 to 22.9 ft^3/sec) with a peak flow of 15,200 gallons per minute (33.9 ft^3/sec). On the East Range Site the average annual appropriation is expected to be about 7,400 gpm (16.5 ft^3/sec) and have a peak appropriation of about 10,000 gpm (22.3 ft^3/sec). Clearly, the flow in the St. Louis River at Forbes is insufficient alone to supply the needs of the IGCC Power Station. The DNR Lakefinder indicates that Long Lake has an area of 140 acres with a littoral zone of 76 acres and maximum depth of 33 ft. The littoral zone is defined as that portion of the lake that is less than 15 feet in depth. The littoral zone is where the majority of the aquatic plants are found and is a primary area used by young fish. This part of the lake also provides the essential spawning habitat for most warmwater fishes (e.g. bass, walleye, and panfish). Assuming that the volume of water in the littoral zone is 1,140 acre-feet (i.e., 76 acres x 15 ft.) or 371,444,800 gallons and that there is no flow into the lake from other sources, at the annual average rate of appropriation for the IGCC Power Station (at 3 cycles of concentration), the Station would consume all the water in the littoral zone in 25 days. Excelsior concludes that the only way to make this site work would be to develop and maintain a large reservoir into which water could be continually pumped to provide storage in case of extended dry periods. This is deemed unacceptable given the site's development constraints.

Conclusions

Along with the other issues regarding this site, namely the cramped location and surrounding wetland areas, this site is not deemed to be practicable.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 2 Site Name: Clinton Township East T: 57N R: 18W Section: 11/12 Acres: ~620

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +14 CN OS Other:

Rail Discussion: Two rail suppliers are not possible at this site due to the long distance between the two systems' trackage.

Other Transportation: Good access via CR 7 and 18th Avenue

Water Supply: Elbow Lake, Thunderbird Mine Pit dewatering activities, and other abandoned mine pits.

Water Supply Discussion: Water availability from Elbow Lake is poor. Thunderbird Mine Pit dewatering activity is ongoing at present.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 16L & 37 on site

HVTL Discussion: Good access to Forbes Substation

General Description

Flat area with numerous wetlands and residential properties nearby; ~35 miles to BWCA and ~60 miles to VNP. The site is constrained by residential properties and existing infrastructure; to move in a direction more suitable for development would place the IGCC Power Station footprint completely within the boundary of the Eveleth Taconite mining boundary.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
P9	T1, T2	C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	The only feasible location for development within the area would place the IGCC Power Station Footprint completely within the current mining permit boundary of Eveleth Taconite.
Technical	The site falls within the Eveleth Taconite mine permit boundary which would constrain development, wetlands, HVTL corridors, residential areas, and existing highways will also provide constraints to overall site development.
Site Control	Obtaining site control of the usable property near Site No. 2 is deemed highly improbable.

Other Discussion

Approximately 38 acres of wetlands affected by IGCC Power Station footprint; 23% of site occupied by wetlands.

Quantitative Analysis

The Thunderbird Mine Pit dewatering activity and other temporarily abandoned mine pits are good possibilities for obtaining water, but the logistics for obtaining them have not been studied because the principal downfall of this site is that a significant portion of the upland area bounding the original site lies within the mine permit boundary of Eveleth Taconite. From both wetlands and site development perspectives the site is unworkable. The issues that arise as a result of moving the IGCC Power Station to the West from where it is shown in Figure 25 become obvious.

Conclusions

Site No. 2 is unworkable due to site development constraints (i.e., being within the mining boundary of Eveleth Taconite and/or constrained by existing residential developments and wetland areas).

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 3 Site Name: Clinton Township West T: 57N R: 18W Section: 9/10 Acres: ~410

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +14 CN: OS Other:

Rail Discussion: The option for two rail suppliers is unlikely

Other Transportation: Good access via CR 7

Water Supply: Elbow Lake, Thunderbird Mine Pit dewatering activities, and other abandoned mine pits

Water Supply Discussion: Water availability from Elbow Lake is poor. Thunderbird Mine Pit dewatering activity is ongoing at present.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 16L & 37L corridors within 1 mile

HVTL Discussion: Good access to Forbes Substation

General Description

Site is heavily wooded and currently the site of a County recreation site. Terrain on site will present some topographical challenges and wetland disruptions would occur in creating site access. Site is close to HVTL & roads; ~36 miles from BWCA; ~61 miles from VNP; and located in Lake Superior Basin. Gravel pit appears to be located on site.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
P5	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	The water supply strategy for two phase operation is tenuous. Existing county recreation site would be removed. T
Technical	Insufficient room for rail loop, two phase plant footprint and buffer without taking numerous residential dwellings. Site development is constrained by Elbow Lake, residential properties and recreational area; general shape of land available due to constraints does not match plant layout.
Site Control	

Other Discussion

Site No. 3 has the lowest impact on NWI wetlands associated with footprint of IGCC Power Station (~3 acres); about 3% of site covered by NWI wetlands. However, numerous residential properties would be required to be taken. See Figure 25 to see how the Power Station footprint could be configured on this site.

Quantitative Analysis

See Site No. 1 quantitative analysis for a discussion of the issues associated with installation of cooling water intake structures. DNR Lakefinder indicates Elbow Lake is 160 acres in size with a littoral zone of 130 acres. Maximum depth is given as 22 ft. Assuming that the volume of water in the littoral zone is 1,950 acre-feet (i.e., 130 acres x 15 ft.) or 635,366,200 gallons and that there is no flow into the lake from other sources: at the annual average rate of appropriation for the East Range GCC Power Station (7,400 gpm), the Station would consume all the water in the littoral zone in about 60 days. Elbow Lake could be used as a storage reservoir with the Thunderbird mine pit dewatering activities and other temporarily abandoned mine pits augmenting the water supply. Even assuming such augmentation, Elbow Lake water levels would be likely to fluctuate widely making it a poor relatively poor prospect for this site from a permitting perspective without expanding the lake's boundaries and/or dredging it to increase its volume.

The combination of a dubious water supply strategy, the numerous residential properties that would be within the IGCC Power Station footprint and require displacement of families, and the impact on nearby floodplains make this site unlikely to be well received by the MPUC.

Conclusions

Unworkable due mostly to site constraints. See Figure 25 for support of the quantitative analysis and this conclusion.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 4 Site Name: Clinton Township North T: 58N R: 18W Section: 25, 26, & 35 Acres: ~420

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +15 CN: OS Other:

Rail Discussion: No opportunity for competitive two supplier rail options.

Other Transportation: Good access via CR 7

Water Supply: Thunderbird Mine, Virginia WWTP, West Two Rivers Reservoir, Ispat Inland dewatering, runoff

Water Supply Discussion: Water supply would represent a big challenge.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 16L contiguous with site boundary

HVTL Discussion: Good access to Forbes Substation.

General Description

Site is located within city limits of Mountain Iron. Wetlands and the location of the site within a significant portion of Eveleth Taconite's mine permit boundary effectively preclude development at this site. See Figure 26 for support of this description.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
P2, P9	T1,T2	C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Wetlands and land use (i.e., land is within mine permit boundary of Eveleth Taconite) pose intractable problem.
Technical	Constrained in almost every direction by wetlands, HVTLs, existing rail track, and existing highways.
Site Control	Substantial part of original site boundary located within Eveleth Taconite mine permit boundary.

Other Discussion

Wetlands cover 93 acres of IGCC Power Station footprint and~ 66% of site. See Figure 26.

Quantitative Analysis

No quantitative analysis required beyond the amount of wetlands that would be encumbered and the site's location within the mine permit boundary of Eveleth Taconite..

Conclusions

Wetland impacts and site development constraints eliminate this site from the realm of practicability.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 5 Site Name: Manganika Lake T: 58N R: 18W Section: 23, 24, 25, 26 Acres: ~1375

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +16 CN OS Other:

Rail Discussion: No opportunity for two rail suppliers.

Other Transportation: Good access via CR 102, CR 7, US Highway 169, and Maxwell Road.

Water Supply: Virginia WWTP effluent, Thunderbird Mine Pit dewatering, East/West Pit dewatering, West Two Rivers Reservoir, Mountain Iron WWTP effluent, and other surface water runoff.

Water Supply Discussion: It is doubtful that the necessary water supplies for peak two-phase operation can be assembled into a dependable portfolio.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 16L, 37L on site; MP 38L contiguous with eastern property boundary.

HVTL Discussion: Good access to Forbes Substation.

General Description

Site is completely within city limits of Mountain Iron and is split in half by CR 7. The western half is being developed into lake lots (around Mashkenode Lake) and would preclude development there; significant cultural resources found nearby this lake. Rail loop would encircle Manganika Lake, cause significant wetland impacts and require reconfiguration of roads and other infrastructure. City appeared interested in working with Excelsior to acquire land.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
P2, P5	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Water supply for two phase operation is logistical concern. West Two Rivers Reservoir use is unlikely as reservoir was created by US Steel for its own use. Close proximity to residential properties likely to create concerns. Wetland impacts deemed problematic.
Technical	Site development would create significant disruptions of roadway infrastructure and impact new residential development.
Site Control	

Other Discussion

Approximately 45 acres of wetlands impacted by IGCC Power Station footprint; ~ 38% of potential site covered by wetlands. Site located 31 miles from BWCA and 56 miles from VNP. See Figure 26 for configuration of site in general area.

Quantitative Analysis

Water for two phase operation would be required to come from numerous sources, many of which are not predictable (that is , the East and West Pit dewatering from MinnTac, surface runoff, wastewater treatment effluent, the Wacootah and Iroquois Mine Pits, Thunderbird Mine Pit, the Ispat Inland Mine Pit, and other abandoned mine pits). West Two Rivers Reservoir cannot be used as it is owned by U.S. Steel.

The biggest problem with this site is due to development constraints that would place the IGCC Power Station footprint too close to existing residential areas within the Mountain Iron city limits. Wetland impacts associated with site development would be significant.

Conclusions

Unworkable due to site constraints and feasibility of establishing predictable water supplies for two phase operation..

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 6 Site Name: West Aurora T: 58N R: 15, 16W Section: 13 (R16W), 7,8, 17, 18 Acres: ~2,500

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +30 CN OS Other:

Rail Discussion: Two rail supplier option not available. Rail access to site will require significant cut and fill.

Other Transportation: Good access to State Highway 135.

Water Supply: Embarrass Lake, Mine Pit No. 6 and others from Cliffs Erie

Water Supply Discussion: Poor water availability at this site. Wide fluctuations of lake not acceptable. Logistics associated with obtaining water from Cliffs Erie are problematic.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 38L on-site; 39L contiguous with south boundary.

HVTL Discussion: Lengthy, but fair access to Forbes Substation.

General Description

High ground in northeast corner of property most suitable for development. However, large waste rock dump and residential developments in city of Aurora constrain site development. Site is ~26 miles to BWCA; 55 miles to VNP. See Figure 27 for illustration of Station footprint within region assumed for site development..

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☐ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
P5	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Water supply is likely to be insufficient for two phases and Embarrass Lake would undergo wide variation in water levels. Distance is considered too far to be pumped from abandoned mine pits on Cliffs-Erie property. St. James Mine Pit source of Aurora's water supply.
Technical	Waste rock presents constructability issues and site development is constrained by nearby residential development.
Site Control	

Other Discussion

Approximately 27 acres of wetlands would be affected by IGCC Power Station footprint; ~23% of plant site covered by wetlands. See Figure 26 for an illustration of how the site would be configured within the area.

Quantitative Analysis

DNR Lakefinder indicates Embarrass Lake is 442 acres in size with a littoral zone of 408 acres, a maximum depth of 19 ft. and a median depth of 11 ft. Assuming that the volume of water in the littoral zone is 4,488 acre-feet (i.e., 408 acres x 11 ft.) or 1.462 billion gallons and that there is no flow into the lake from other another source; at the annual average rate of appropriation for the IGCC Power Station of 7,400 gpm the Station would consume all the water in the littoral zone in about 137 days. This makes Embarrass Lake a poor prospect for this site from a permitting perspective.

The biggest issue with respect to this site is its site development constraints. The site is bounded by a mine dump to the West (mine dumps pose a constructability issue because of the uncertainty associated in knowing whether or not bedrock has been encountered), residential areas to the East, the highway to the north, and the rail line and wetlands to the South.

Conclusions

Deemed unworkable from a site development perspective.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 7 Site Name: Hoyt Lakes West T: 59N R: 14, 15W Section: 31 (14W); 25, 26, 36 Acres: ~ 1,630

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN ~43 CN < 1 Other:

Rail Discussion: One supplier only. Existing rail bed present on site.

Other Transportation: Road access is poor, indirect and would require easements across Cliffs Erie property.

Water Supply: Abandoned mine pits (No. 6, Denora, Stevens, 2WX, Knox) and Colby Lake

Water Supply Discussion: Mine pits on site not subject to concerns over wide fluctuations, but quality is poorer than mine pits on West Range.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 34L, 38L, 39L all ~ 1 mile south

HVTL Discussion: Distance to Forbes Substation is concern (all distances > 33 miles)

General Description

Site is owned by private entity that is unwilling to sell and State of Minnesota. Site is large, disturbed in places, and has significant wetland areas. State of Minnesota owns Section 36 which is school trust land requiring minerals assessment. Site boundary lies within the Iron Formation. Site is ~25 miles from BWCA; 54 miles from VNP. See Figure 27 for illustration of site configuration.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☐ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
P9		C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Plant is located completely within Iron Formation and deemed to be unobtainable.
Technical	
Site Control	Present owner will not sell its property at this location. State of Minnesota would be required to retain minerals underlying site. Acquisition and minerals deemed insurmountable problems.

Other Discussion

Approximately 19 acres of wetlands affected by IGCC Power Station footprint; ~ 34% of plant site covered by wetlands

§ 404 (b)(1) Compliance Summary Matrix

The main problem with this site is related to obtaining site control. As noted above, private owner will not sell its property and the State of Minnesota owns a block of land in the middle of site where the plant would need to be located. This site is in the Iron Formation and therefore, the DNR will have serious concerns about its development as a IGCC Power Station Site.

Wetlands would pose a significant issue if this site were to be developed.

Conclusions

Unworkable due to the inability to acquire site control and underlying ownership of the state's mineral interests.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 8 Site Name: W. Two Rivers Reservoir T: 58N R: 18W Section: 16, 17, 20, 21 Acres: >2,000

Rail Provider: ☐ BN ☐ CN ☒ Other Distance (mi): BN CN <1 Other:

Rail Discussion: CN track runs past site, but presents no real opportunity for modest loop.

Other Transportation: US 169 provides exceptional access.

Water Supply: West Two Rivers Reservoir, West/East Mine Pit dewatering, Mountain Iron WWTP

Water Supply Discussion: Water availability deemed poor based on devotion of West Two Rivers Reservoir to owner's mining interests.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 25L tap line on-site

HVTL Discussion: MP 25L presents route to Shannon Substation and Forbes Substation via 37L or 16L

General Description

The land surrounding W. Two Rivers Reservoir is owned by an entity which constructed the reservoir especially for its own use (Personal communication, Daniel Hestetune, SEH Engineering, 2005). Preferred site is located within Minntac mine permit boundary; therefore, property is deemed unobtainable. See Figure 26 for preferred building location on this site.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
P5	T1, T2	C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Present owner engaged in mining activities and would be unlikely to grant permission to another party for use of water from West Two Rivers Reservoir.
Technical	Site development is constrained due to US 169 and reservoir on reservoir's north side. Wetlands constrain developments elsewhere. See Figure 26 in support of this position.
Site Control	Property owner would not grant access to site as it is within mine permit boundary.

Other Discussion

Approximately 49 acres of wetlands would be impacted by IGCC Power Station footprint. See Figure 26.

Quantitative Analysis

Preferred site for IGCC Power Station would be within Minntac mine permit boundary and, therefore, is deemed unobtainable. In addition, West Two Rivers Reservoir is within the mine permit boundary and deemed the exclusive right of the property owner to be used in support of mining activities. Beyond these two factors, wetland impacts would pose a major problem; see Figure 26 as an example of how the site would be constrained in this regard.

Conclusions

Unworkable due to site control issues.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 9 Site Name: East Range Site T: 59N R: 14W Section: 28, 32, 33 Acres: ~810

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN ~44 CN ~3/4 Other:

Rail Discussion: CN is only rail supplier at this location. Lake Superior access would require upgrade of existing track to accommodate unit coal trains.

Other Transportation: Good access via CR 666 and CR 110.

Water Supply: Abandoned mine pits (2WX, 6, Denora, Stephens, Knox, 2, & 3) and Colby Lake

Water Supply Discussion: Widely fluctuating levels of no concern as with West Range Site, but water quality is relatively poor

HVTL: ☒ 115 kV ☐ 230 kV ☒ Other Line Nos.: MP 43L, 38L, 39L, 34L

HVTL Discussion: MP 43L is 138 kV HVTL leading to Syl Laskin Substation where 38L, 39L, and 34L HVTLs originate. Distance to Forbes Substation is significant with the 38L and 39/37L routes being ~ 35 miles each.

General Description

This site is the alternate site described in the Joint Application and Environmental Supplement. The site is located almost completely within the city limits of Hoyt Lakes and is mostly undisturbed with the exception of being periodically logged. The site is the closest of any to the BWCA and VNP being 25 and 54 miles distant, respectively.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☐ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting
Technical
Site Control

Other Discussion

Approximately 15 acres of NWI wetlands affected by IGCC Power Station; ~ 35% of site occupied by wetlands.

§ 404 (b)(1) Compliance Summary Matrix

Section No.	ACOE	Description of Compliance Criteria	Complies	Does Not Comply
§230.10(a)	1	Overcome presumption that practicable, less environmentally damaging alternative site, outside special aquatic sites, exists	X	
	2	No alternative that is practicable, is less damaging to the aquatic ecosystem, and has no other significant environmental effects		X (see narrative text beginning on page 21 of report)
§230.10(b)	3	Discharge must not violate state water quality standards or CWA Section 307 toxic effluent standards or bans		
	4	Project not jeopardize the continued existence of an endangered species		
§230.10(c)	5	Must not cause significant adverse effects ("MNCSAE") on municipal water supplies, plankton, fish, shellfish, wildlife, special aquatic sites or other aspects of human health or welfare		
	6	MNCSAE on life stages of aquatic life and other wildlife dependent on aquatic ecosystems		
	7	MNCSAE on ecosystem diversity, productivity, or stability		
	8	MNCSAE on recreational, aesthetic or economic values		
§230.10(d)	9	All appropriate and practicable steps taken to minimize adverse impacts		

Conclusions

To produce the same amount of electricity as the Phase I and Phase II developments at the West Range Site, the East Range IGCC Power Station would produce an additional 11.5 tons/yr of sulfur dioxide ("SO_2"), 23.8 tons/yr of nitrogen oxides ("NO_X"), and about 44,000 tons/yr of carbon dioxide ("CO_2"). Furthermore, the additional cooling load and associated drift that results from complete zero liquid discharge treatment causes an increase of PM_{10} emissions of 215 tons/yr, which represents an increase of approximately 44%. Also, there is a greater loss of electricity delivered to the East Range Site's point of interconnection with the regional electrical grid and added impacts to air quality related values predicted in the BWCA and Voyageurs' National Park. Aquatic ecosystems in pits may be impacted due to widely fluctuating water levels. See narrative text beginning on page 21 for discussion of environmental elements considered in support of §230.10(a) conclusion.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 10 Site Name: Mountain Iron T: 58N R: 18W Section: 1-3, 10-12 Acres: ~1,520

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +14 CN OS Other:

Rail Discussion: CN only practicable supplier. BN track at one time connected with Mountain Iron site, but trackage has been removed and made into a recreational trail.

Other Transportation: Good access to US 169 and CR 102.

Water Supply: Abandoned mine pits (Wacootah, Iroquois), East & West Pits dewatering flows, Ispat Inland dewatering flows, surface water runoff, Silver Lake overflow.

Water Supply Discussion: Water supply will be stretched and require pumping to a surge basin during high flow periods to accommodate two phase operation.

HVTL: ☒ 115 kV ☒ 230 kV ☐ Other Line Nos.: MP 37L, 25L, 80L (230 kV)

HVTL Discussion: Sufficient HVTL corridors exist to provide route diversity to Forbes Substation.

General Description

The southern boundary of the Iron Formation (IF) runs through the middle part of the site. Negotiations were conducted with City managers and a contract was drawn up and presented to the City Council. The City Council tabled consideration of the contract due to impacts on numerous residents, the strong objection of Minntac (because of the company's intention to mine it), and the concurrence of the Minnesota DNR regarding such intentions. See Figure 26.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☐ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
P9		C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Too many residents, US Steel, and the DNR objected to the Project's location at this site. Iron formation cuts through site.
Technical	
Site Control	The City of Mountain Iron maintains control of critical parcels of property on site and without their support, the site was not practicable.

Other Discussion

Approximately 23 acres of wetlands impacted by IGCC Power Station footprint. Minnesota DNR (Division of Lands & Minerals) discouraged consideration of this site.

Quantitative Analysis

The Iron Formation cuts across the boundary of this site and MinnTac has indicated its intention to expand its mine permit to encompass such area. As a result of MinnTac's stated interest, the DNR, City of Mountain Iron and numerous residents objected to moving forward; the City, most importantly, withdrawing its support to negotiate a site agreement.

In addition, there are significant number of residents (~80 in number) that would be placed in relatively close proximity to the IGCC Power Station.

Conclusions

Site control and lack of support from the City of Mountain Iron make this site unworkable at this time.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 11 Site Name: Leonidas T: 58N R: 18W Section: 25, 36 Acres: <704

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +16 CN OS Other:

Rail Discussion: Only single provider likely.

Other Transportation: Good access via US Highway 53, CR 37, CR 7 and Fayal Road.

Water Supply: Virginia WWTP effluent, Thunderbird Mine Pit dewatering, East Pit dewatering, West Two Rivers Reservoir, Mountain Iron WWTP effluent, and other surface water runoff.

Water Supply Discussion: Logistics for obtaining water believed to be difficult for two phase operation.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 16L tap line

HVTL Discussion: Sufficient connections to Forbes available.

General Description

This site was thought to represent an alternative location for Mesaba Project, but feasibility of building on waste rock, the constraints on development associated with wetlands and the abandoned mine pit discounted its potential. See Figure 26.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
P9	T1, T2	C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Existing site lies partly within Eveleth Taconite's mine permit boundary and Iron Formation prohibitively constraining developments.
Technical	Waste rock pile presents constructability concerns and the constraints provided by the mine pit to the east, wetlands to the west, and the city to the south preclude effective development of the site.
Site Control	Mining entity would not allow construction of IGCC Power Station with mine permit boundaries.

Other Discussion

Approximately 28 acres of wetlands impacted by the IGCC Power Station footprint.

Qualitative Analysis

The site is too constrained making development unworkable due to conflicts with the Eveleth Taconite Mine Permit boundary, wetlands, existing infrastructure and mine dumps. In addition, mine dump creates constructability issues (see footnote 16 on page 14 of narrative text for explanation of constructability issues).

Conclusions

Site development issues preclude the feasibility of development at this site.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 12 Site Name: Buhl T: 58N R: 20W Section: 17-20 Acres: 850

Rail Provider: ☐ BN ☐ CN ☐ Other Distance (mi): BN +5 CN <1 Other:

Rail Discussion: No existing rail presently serves this site, but at one time CN track served the area.

Other Transportation: Good access via US Highway 169 and CR 453

Water Supply: Sherman Mine Pit, Fraser Mine Pit, Iron Word

Water Supply Discussion: Water availability is uncertain at this site (other factors eliminated consideration of this site).

HVTL: ☐ 115 kV ☒ 230 kV ☐ Other Line Nos.: MP 80L to Forbes

HVTL Discussion: Forbes Substation about 10 miles

General Description

This present owner of the site has refused to sell the part of the site that is north of US 169. Most of the site south of US 169 is a mine dump (which causes constructability issues). Coal delivery issues may exist due to terrain obstacles for the rail track. Constructability concerns regarding the mine dumps on the site south of US 169 preclude serious consideration of the site. See Figure 28.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☒ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	
Technical	Constructability issues due to the presence of mine dumps and problems with rail grade are expected. Availability of adequate water supply is concern.
Site Control	

Other Discussion

IGCC Power Station footprint must be located away from mine dumps and the only location on site is where wetlands are more prevalent; IGCC Power Station foot print alone would impact approximately 68 acres of wetlands. See Figure 28.

Quantitative Analysis

Constructability issues (see footnote 16 on page 14 for a discussion of the general concern associated with building on a mine dump) would force development of the site footprint into an area having a high proportion of wetlands.

Conclusions

Site development precluded due to constructability issues and constraints posed by wetland areas.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 13 Site Name: West Chisholm T: 58N R: 20W Section: 17-20 Acres: 785

Rail Provider: ☐ BN ☐ CN ☐ Other Distance (mi): BN CN Other:

Rail Discussion: No rail supplier presently can provide service to this site because of grade differences.

Other Transportation:

Water Supply:

Water Supply Discussion:

HVTL: ☐ 115 kV ☐ 230 kV ☐ Other Line Nos.:

HVTL Discussion:

General Description

This site is on a mine dump and provides some constructability issues. Originally, the site was thought to be capable of being served by the rail system delivering taconite pellets to Lake Superior. This however, was not possible as trains could make it up the hill to Hibtac only because they were empty.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☒ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
	T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	
Technical	The site is not accessible via train.
Site Control	

Other Discussion

Infeasible to consider this site.

Quantitative Discussion

None required, rail access is not feasible.

Conclusion

Rail access is not feasible.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 14 Site Name: Hibbing Industrial Park T: 57N, 58N R: 20W Section: 3,4 (57N), 33,34 (58N) Acres: 860

Rail Provider: ☒ BN ☒ CN ☐ Other Distance (mi): BN OS CN OS Other:

Rail Discussion: Possibility of two suppliers at this site. However, BN has concerns about unit coal train traffic through Hibbing.

Other Transportation: Good access via US Highway 169.

Water Supply: Abandoned Mine Pits (Hull-Rust dewatering, Iron World)

Water Supply Discussion: Uncertain about how much water is available from Iron World and dewatering from Hull-Rust Mine Pit.

HVTL: ☐ 115 kV ☐ 230 kV ☒ Other Line Nos.: Xcel has 500 kV HVTL that traverses the Site on Route to Forbes Substation

HVTL Discussion: Alternate path to Blackberry Substation is available.

General Description

This site is located in a planned industrial park that has been incorporated into a comprehensive plan for the communities of Hibbing, Chisholm and Buhl. The site is currently owned by IRR and committed to other development. See Figure 28.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☒ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
	T1	C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	
Technical	The site is constrained to the north by the Iron Formation, to the south by residential developments, and to the east by mineral mining operations. In order to accommodate the IGCC power station dual rail potential, additional land must be acquired within the Iron Formation or from other landowners outside the boundary of the current owner's property making acquisition more difficult.
Site Control	The IRR has committed the site to another developer's project.

Other Discussion

The IGCC Power Station footprint will impact about 35 acres of wetlands. The potential for dual rail access will be difficult given the proximity of the site to the iron formation (to the north) and residential properties to the south and east.

Quantitative Analysis

See Figures 7 and 28 to see the difficulty of positioning the site footprint within the site boundary and off the Iron Formation.

Conclusions

The site is currently committed to another developer's project and unavailable for development at this time by Excelsior.

Mesaba Energy Project: IGCC Power Station Site Evaluation Sheet

Site Identification

Site No.: 15 Site Name: West Range Site T: 56N R: 24W Section: 2,3,10-12 Acres: ~1,260

Rail Provider: ☒ BN ☒ CN ☐ Other Distance (mi): BN ~2 CN ~2 Other:

Rail Discussion: Both suppliers have access to the site.

Other Transportation: Good access by US 169 and CR 7.

Water Supply: Canisteo Mine Pit, Hill-Annex Mine Pit Complex, Lind Pit, West Hill Mine Pit, and Prairie River

Water Supply Discussion: One of the best places in the TTRA where adequate water supplies are assured for two phase operation

HVTL: ☐ 115 kV ☐ 230 kV ☒ Other Line Nos.: New 345 kV outlet facilities planned ~9 miles in length

HVTL Discussion: Blackberry Substation is point of interconnection.

General Description

A large block of land has been optioned from RGGS and contract agreeing to provide Excelsior mineral rights to 550 acres of property and to provide easements across RGGS land in accordance with commercially reasonable terms. See Figure 29.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☐ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting

Technical

Site Control

Other Discussion

IGCC Power Station footprint would impact only 11 acres of NWI wetlands.

§ 404 (b)(1) Compliance Summary Matrix

Section No.	ACOE	Description of Compliance Criteria	Complies	DNC
§230.10(a)	1	Overcome presumption that practicable, less environmentally damaging alternative site, outside special aquatic sites, exists	X	
	2	No alternative that is practicable, is less damaging to the aquatic ecosystem, and has no other significant environmental effects	X	
§230.10(b)	3	Discharge must not violate state water quality standards or CWA Section 307 toxic effluent standards or bans	X	
	4	Project not jeopardize the continued existence of an endangered species	X	
§230.10(c)	5	Must not cause significant adverse effects ("MNCSAE") on municipal water supplies, plankton, fish, shellfish, wildlife, special aquatic sites or other aspects of human health or welfare	X	
	6	MNCSAE on life stages of aquatic life and other wildlife dependent on aquatic ecosystems	X	
	7	MNCSAE on ecosystem diversity, productivity, or stability	X	
	8	MNCSAE on recreational, aesthetic or economic values	X	
§230.10(d)	9	All appropriate and practicable steps taken to minimize adverse impacts	X	

Conclusions

West Range site is least damaging practicable alternative for the reasons set forth in the narrative text beginning at page 21.

Large portions of the TTRA are unsuitable due to insufficient proximity to rail lines and other necessary infrastructure.

The portion of of DWP track north of Britt is unsuitable due to insufficient proximity to transmission lines.

The crosshatched portion of the TTRA represents the 'Search Area,' as it meets threshold requirements for rail, HVTL and water access. See Figures 2 through 23 for in-depth examination of this region.

The portion of DMIR track east and south of the Hoyt Lakes site is unsuitable due to insufficient proximity to transmission lines and/or the lack of water sources.

Fond du Lac Reservation

MINNESOTA

Margie
Nett Lake
Cusson
Buyck
Orr
Gheen
Winton
Ely
Craigville
Effie
Cook
Togo
Soudan
Tower
Forest Center
Grand Marais
Bigfork
Wirt
Angora
Babbitt
Embarrass
Britt
Lutsen
Isabella
Max
Marcell
Inger
Tofte
Schroeder
Taconite Harbor
Murphy City
Mountain Iron
Franklin
Virginia
McKinley
Biwabik
Aurora
Hoyt Lakes
Kinney
Pohl
Chisholm
Gilbert
Leonidas
Whyte
Stevenson
Kelly Lake
Iron Junction
Finland
Little Marais
Keewatin
Nashwauk
Forbes
Makinen
Norshor Junction
Ball Club
Zemple
Deer River
Tacon
Marble
Pengilly
Bovey
Coleraine
Zim
Silver Bay
Beaver Bay
Brimson
Rollins
Cohasset
Grand Rapids
La Prairie
Merrude
Wales
Highland
Blackberry
Goodland
Taconite
Kelsey
Cotton
Shaw
Castle Danger
Tobique
Warba
Elmer
Payne
Meadowlands
Swan River
Remer
Wawina
Canyon
Two Harbors
Hill City
Jacobson
Prosit
Alborn
Larsmont
Knife River
Floodwood
Culver
Bornett
French River
Swatara
Brookston
Saginaw
Arnold
Gowan
Cornucopia
Red Cliff
Herbster
Bayfield
Outing
Hermantown
La Pointe
Duluth
Port Wing
Emily
Proctor
Superior
Palisade
Sheshebee
Cloquet
Scanlon
Washburn
Wright
Cromwell
Carlton
Oliver
South Superior
Barksdale
Odanah
Tamarack
Sawyer
Thomson
Ashland
Wrenshall
Hassman
McGregor
South Range
Wentworth
Poplar
Blueberry
Moquah

Legend

- Cities
- Highways
- Rivers
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Lakes

Source: ESRI, Excelsior Energy, and SEH.

UTM Zone 15 Meters
NAD83

N W E S

0 9 Miles

Figure 1: Overview of TTRA Site Selection

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Taconite Tax Relief Area

January 2007

Map Document: (X:\AE\Exenr\050\20\00\03\Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
2/8/2006 – 8:38:13 AM

Bovey
Coleraine
Grand Rapids
La Prairie
56 25
56 24
56 23
55 25
55 24
55 23
54 25
54 24
54 23
MINNESOTA
Limited space; proximity to Trout Lake

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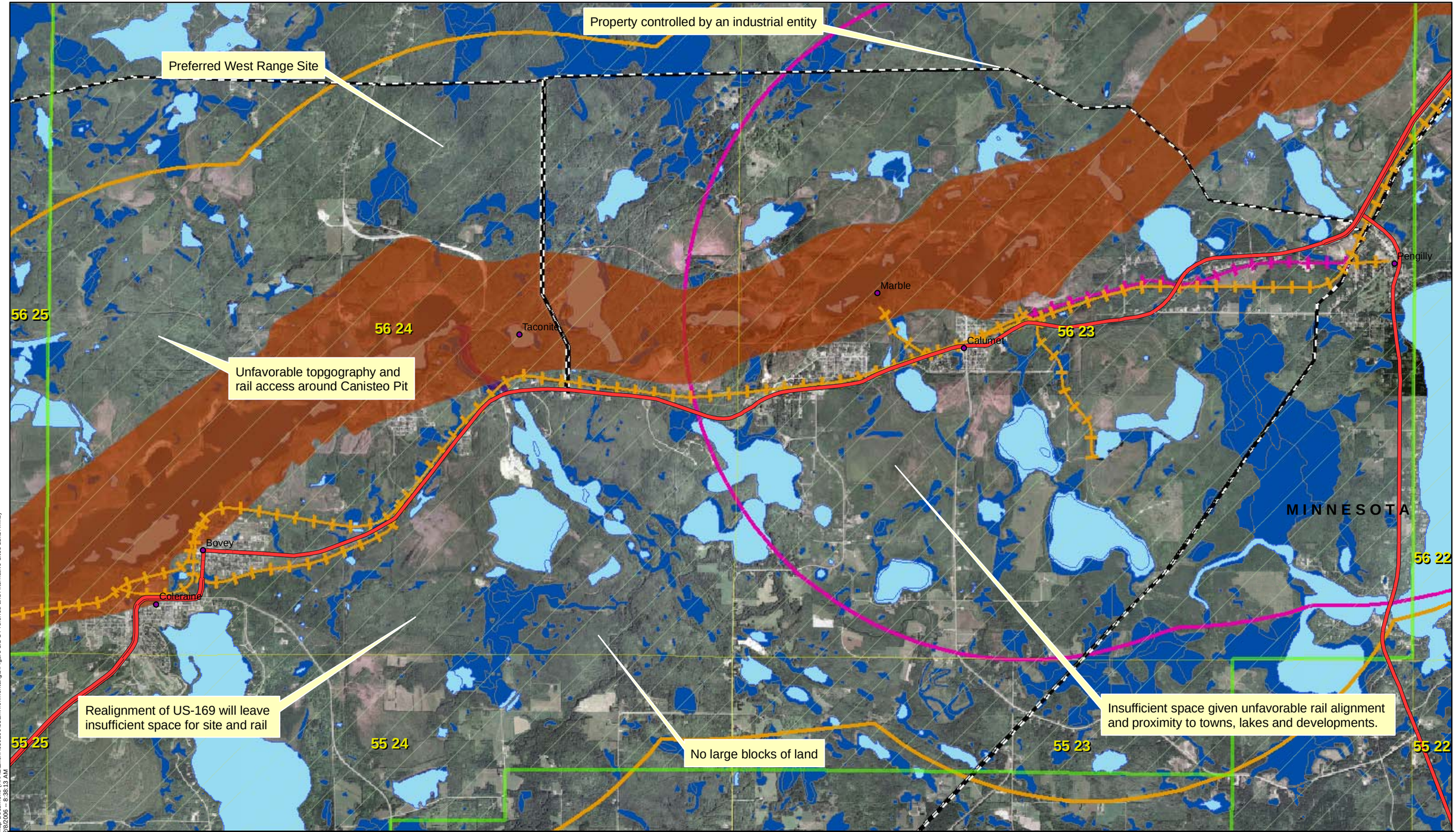
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Figure 2:
TTRA Site Selection

UTM Zone 15 Meters
NAD83

N
W E
S

0 1 Miles



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- Iron Formation
- Lakes
- Wetlands

Source: ESRI, Excelsior Energy, and SEH.

Figure 3: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles

Property controlled by an industrial entity; Sufficient availability of water unlikely

Property controlled by an industrial entity

57 23

57 22

57 21

Nashwauk

Keewatin

Kelly Lake

56 23

56 22

56 21

Pengilly

MINNESOTA

Property controlled by an industrial entity

Property controlled by an industrial entity

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- Floodplains
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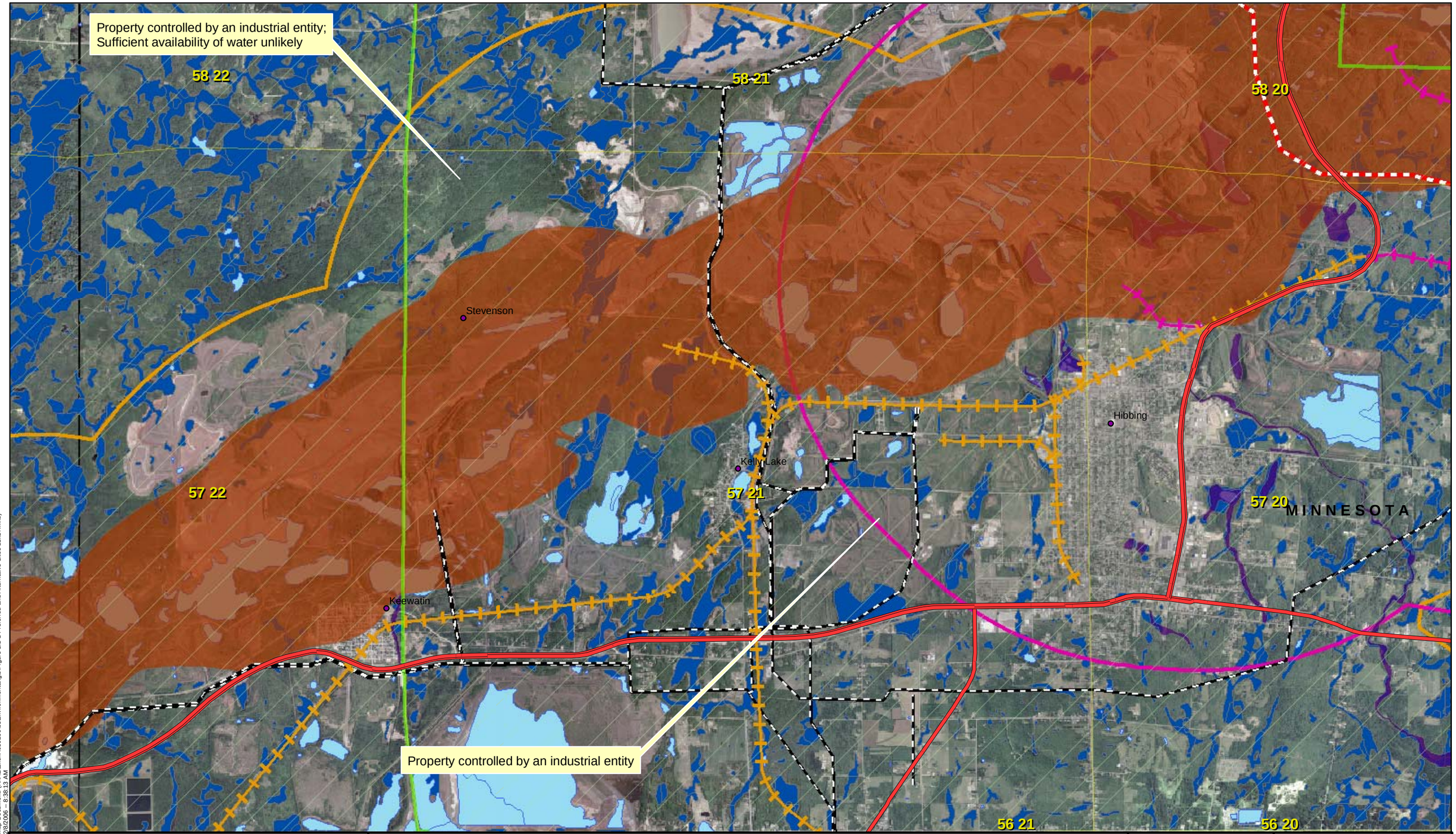
- Wetlands

Figure 4: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- HVTL_500_kV
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- Buffer of DWP
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- Wetlands

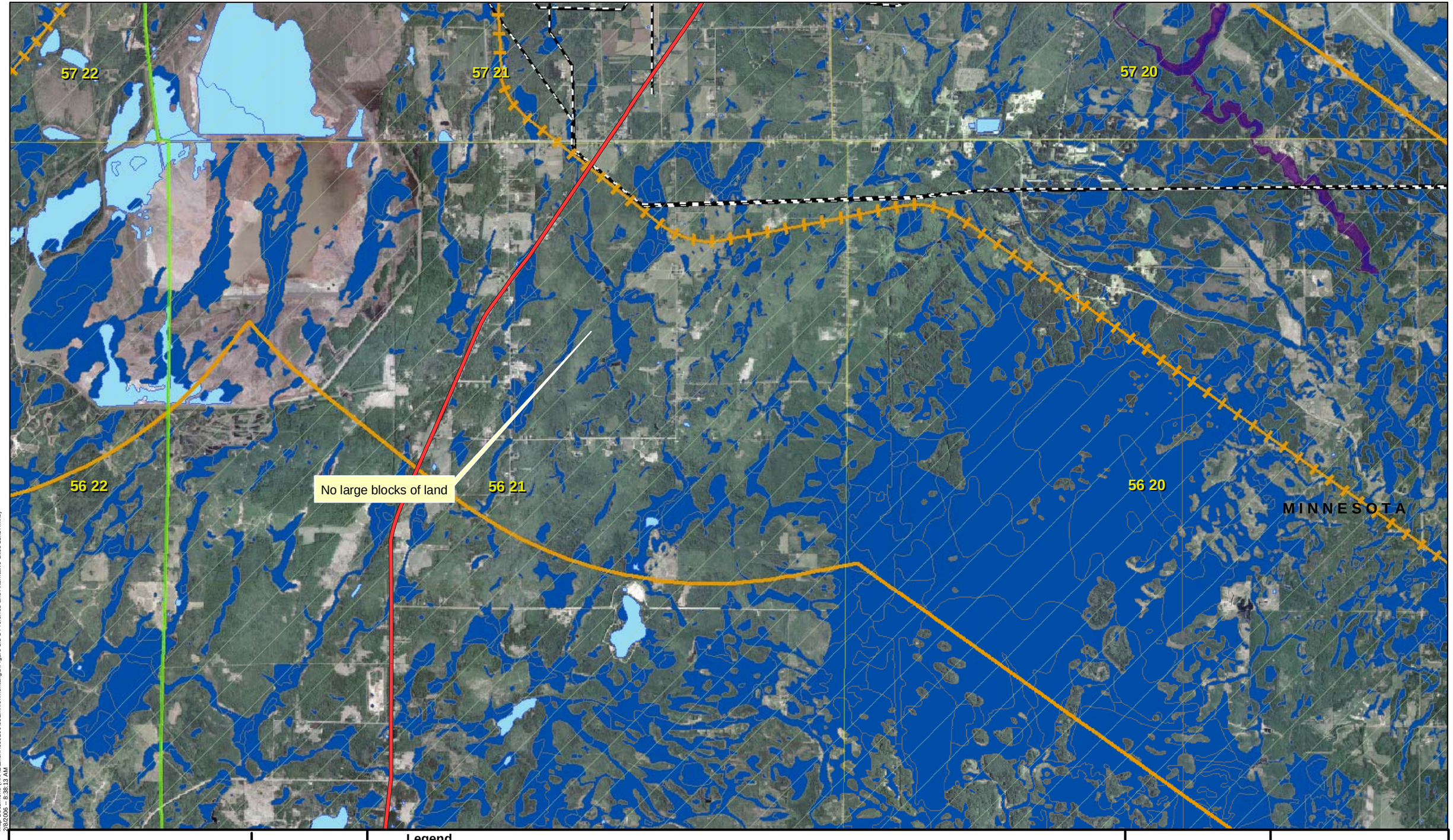
Source: ESRI, Excelsior Energy, and SEH.

Figure 5: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- Wetlands

Source: ESRI, Excelsior Energy, and SEH.

Figure 6: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles

GIS does not reflect that once nearby rail has since been removed

Alternative Site 13

Alternative Site 12

Alternative Site 14

No large blocks of land

Kinney

Buhl

Chisholm

58 21

58 20

58 19

58 18

57 21

57 20

57 19

57 18

MINNESOTA

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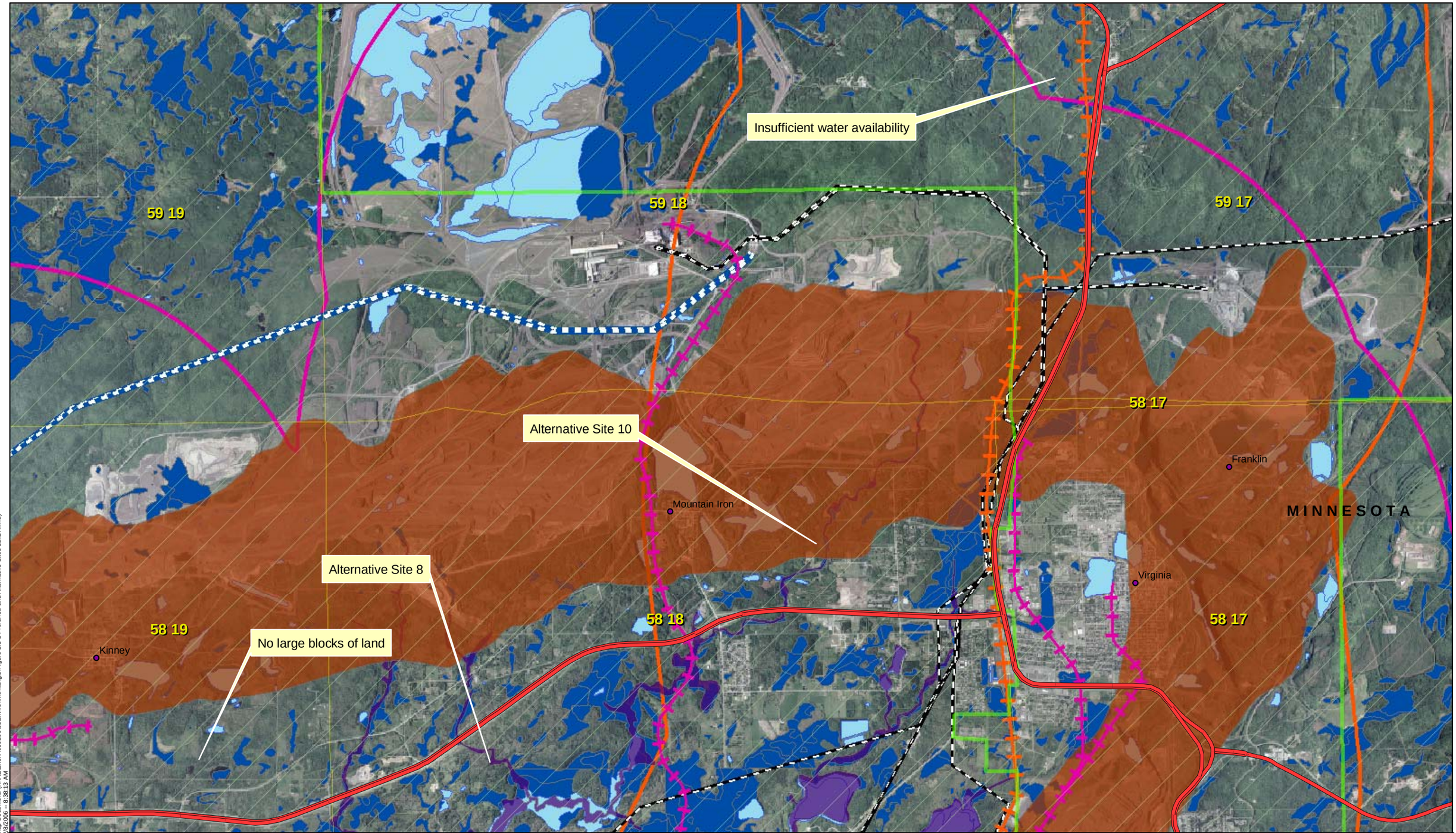
Figure 7: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- Wetlands

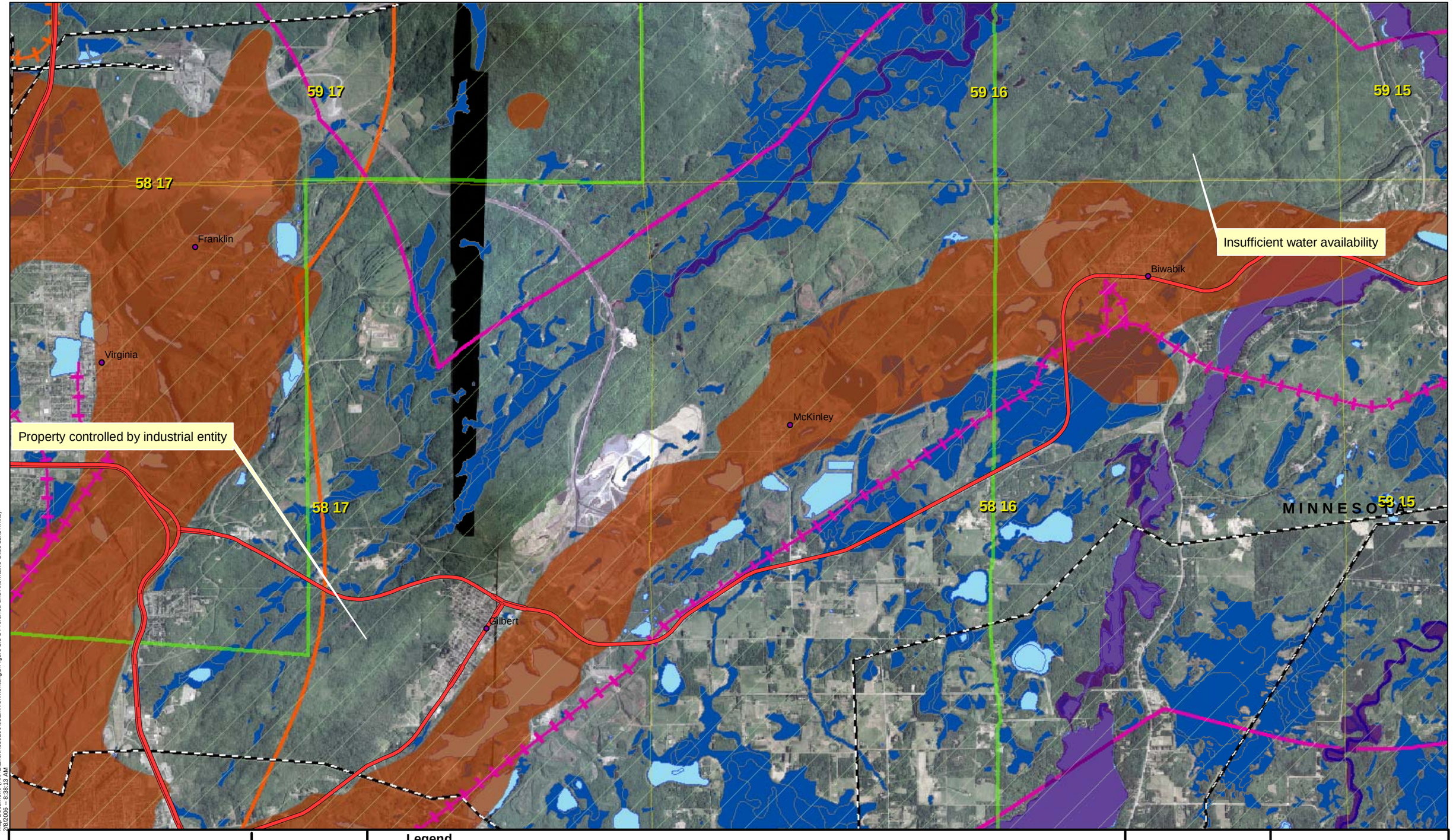
Source: ESRI, Excelsior Energy, and SEH.

Figure 8: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- Wetlands

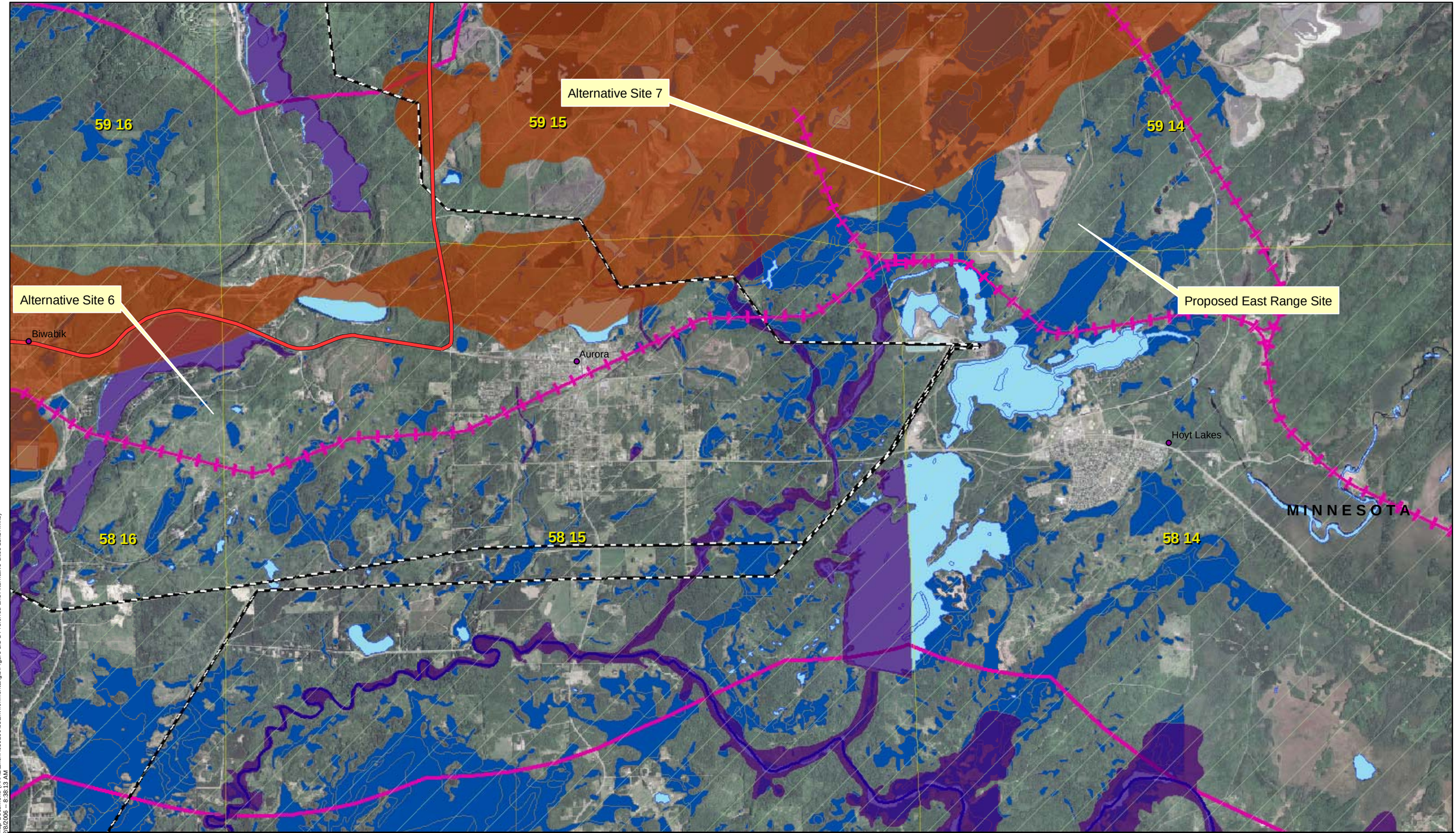
Source: ESRI, Excelsior Energy, and SEH.

Figure 9: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- Wetlands

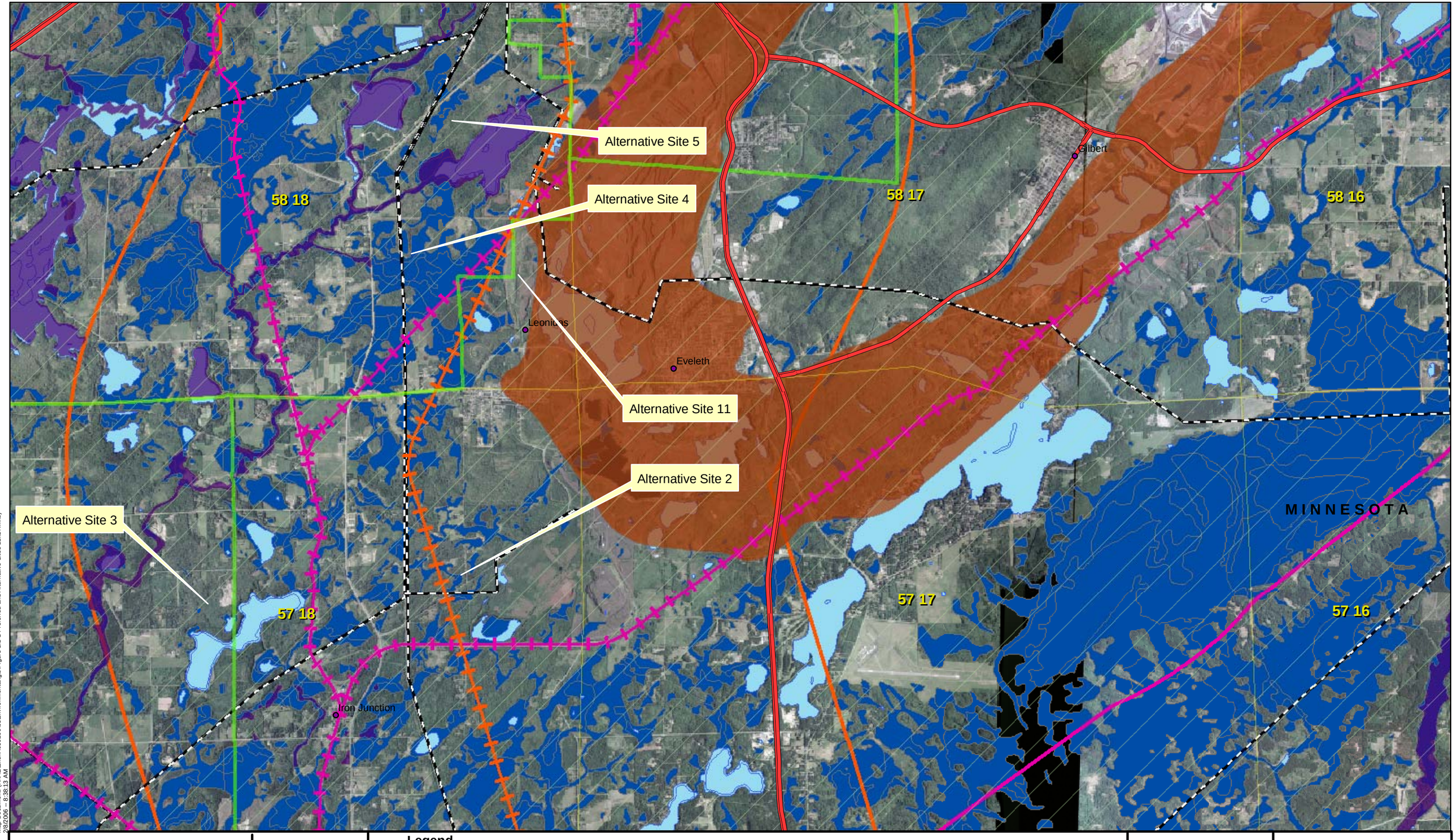
Source: ESRI, Excelsior Energy, and SEH.

Figure 10: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- Lakes
- Wetlands

Figure 11: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles

Iron Junction

57 19

57 18

57 17

57 16

Alternative Site 1

Forbes

No large blocks of land

MINNESOTA

56 19

56 18

56 17

56 16

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- Floodplains
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- Lakes
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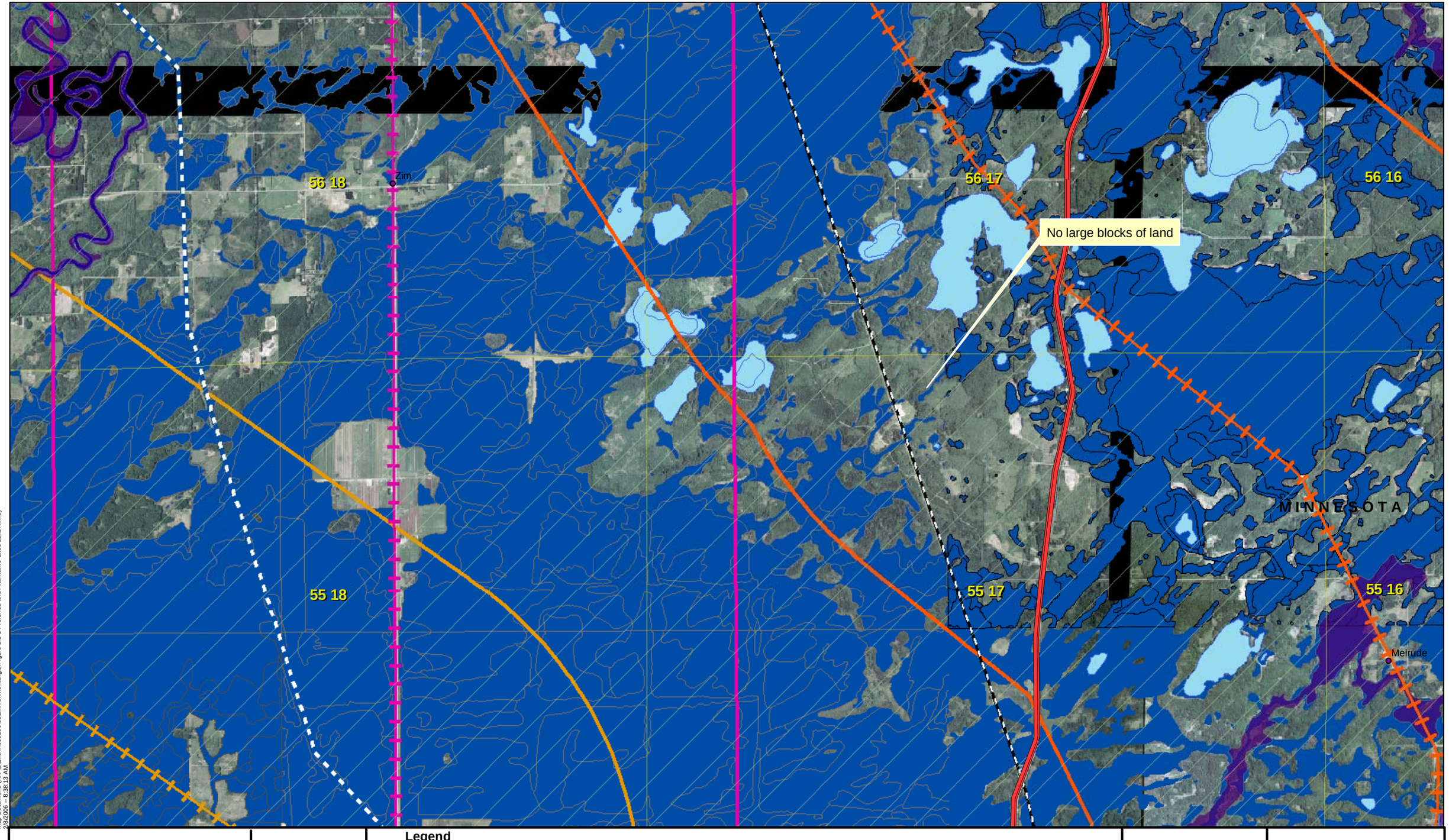
Figure 12: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N
W E
S

0 1 Miles



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- Buffer of DMIR
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- Floodplains
- Iron Formation
- Lakes
- Wetlands

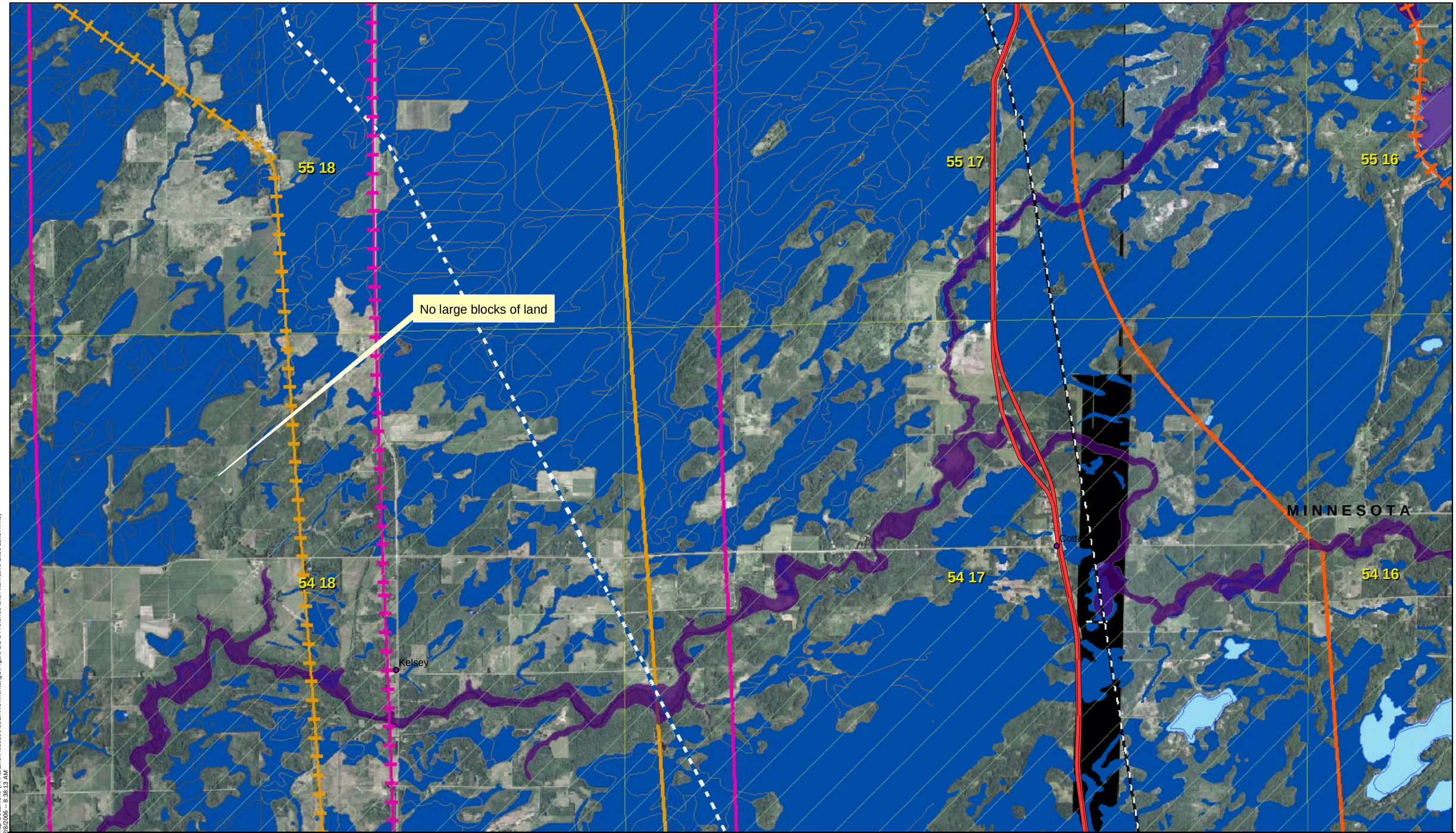
Source: ESRI, Excelsior Energy, and SEH.

Figure 13: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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- Wetlands

Source: ESRI, Excelsior Energy, and SEH.

Figure 14: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles

55 17

55 16

55 15

Insufficient water availability

Cotto

54 17

54 16

MINNESOTA

54 15

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- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Source: ESRI, Excelsior Energy, and SEH.

Figure 15: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N
W E
S

0 1 Miles

54 17
54 16
54 15
Shaw
Insufficient water availability
53 17
53 16
53 15
MINNESOTA
52 17
52 16
52 15

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- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Figure 16: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N
W E
S

0 1 Miles

Payne

Meadowlands

53 19

53 18

52 19

52 18

52 17

Abundance of wetlands makes siting unlikely

MINNESOTA

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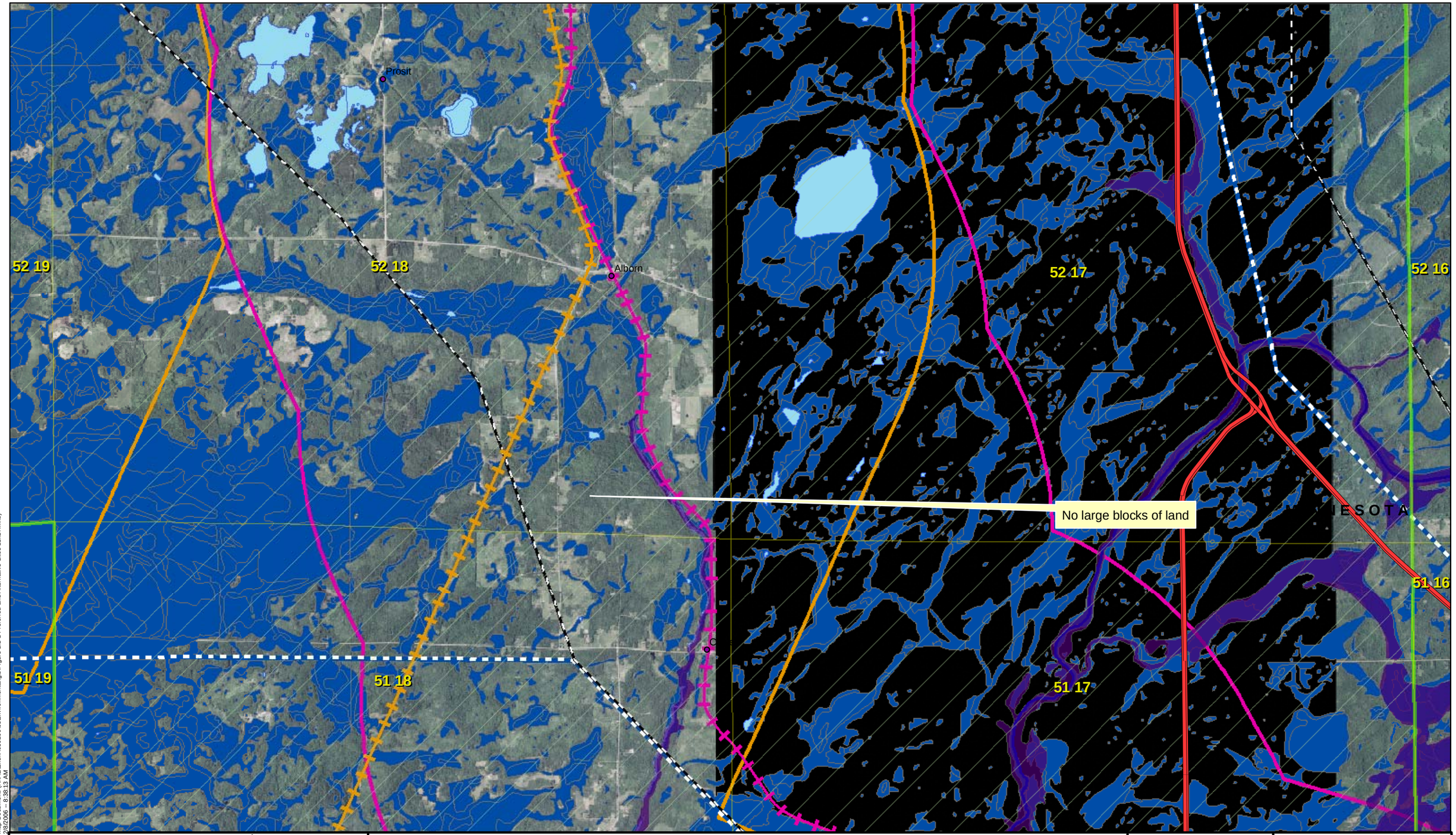
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Figure 17: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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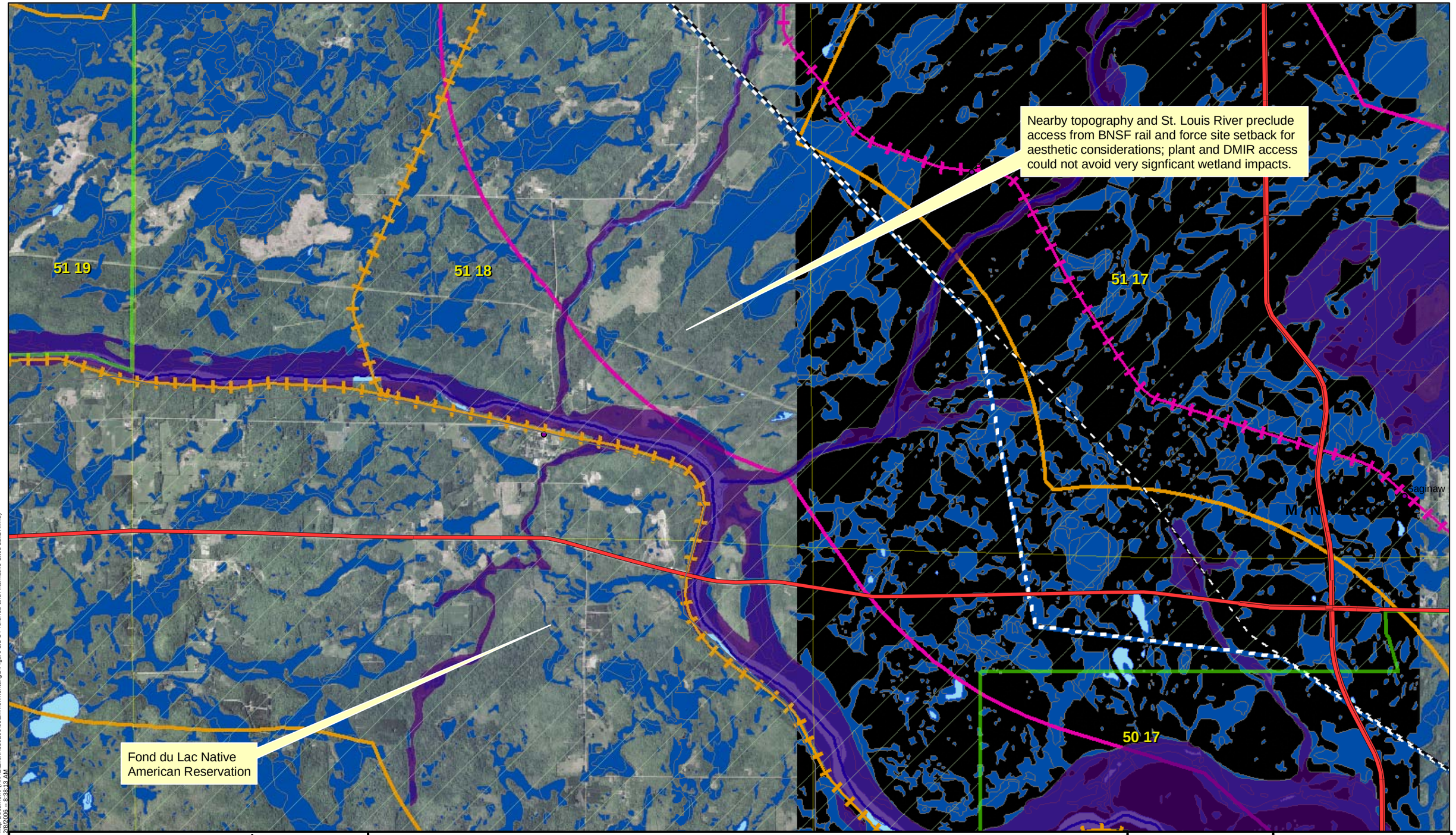
Phone 952.847.2360 Fax 952.847.2373

Taconite Tax Relief Area

January 2007

Figure 18: TTRA Site Selection



Map Document: (X:\AE\Exen\05020003\Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Taconite Tax Relief Area

January 2007

Legend

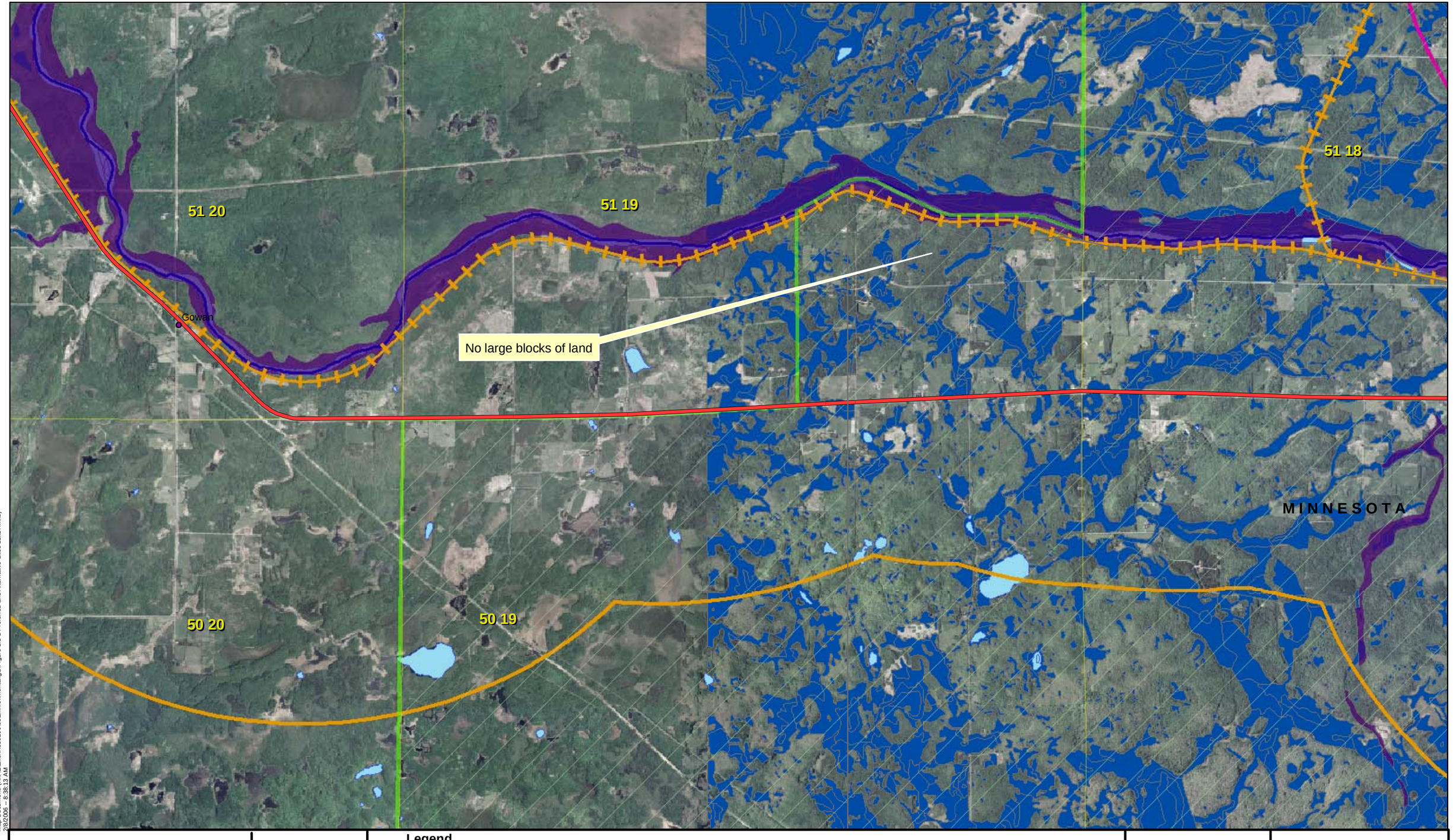
- Cities
- Highways
- Rivers
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Figure 19: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



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Legend

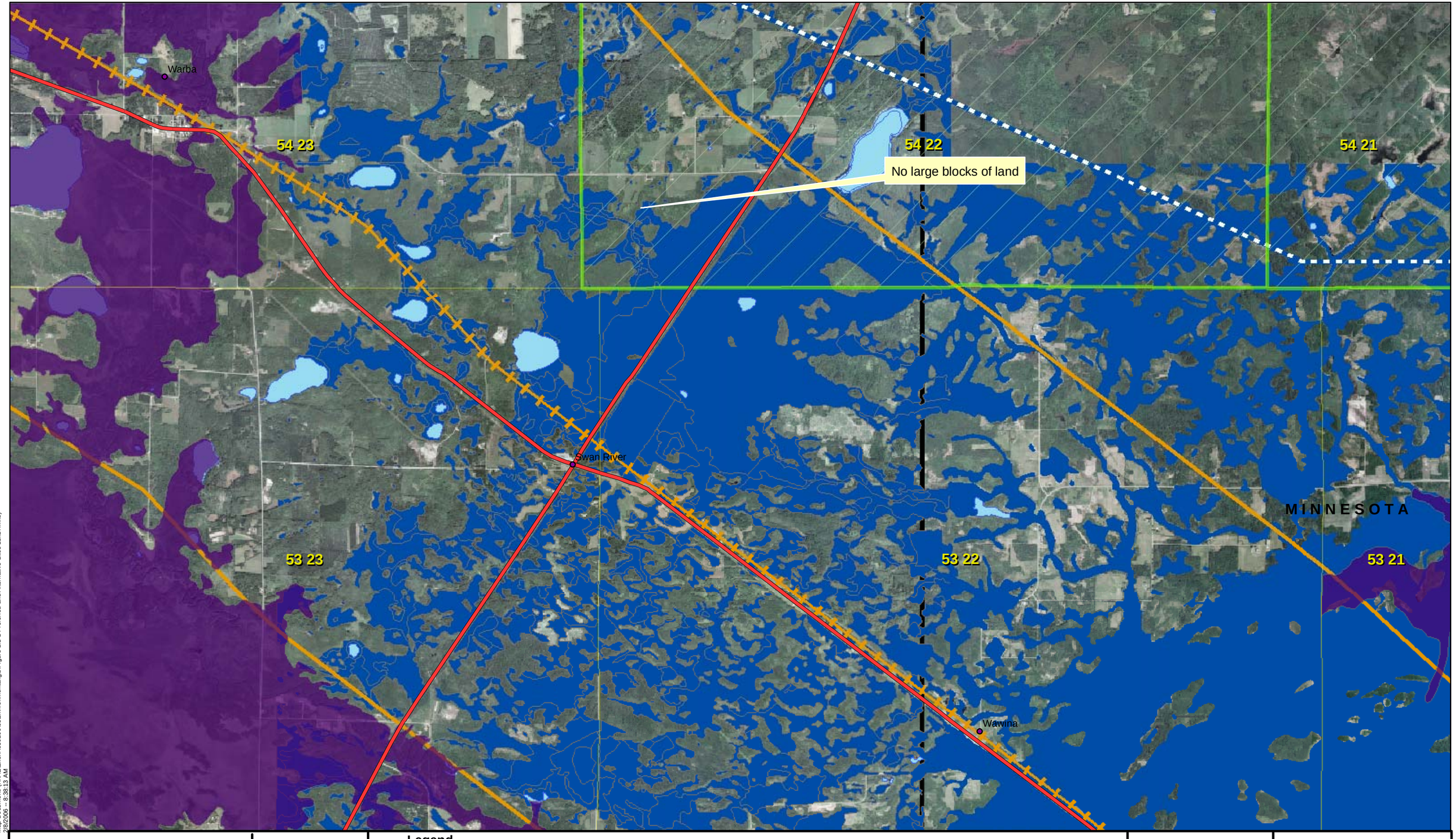
- Cities
- Highways
- Rivers
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Figure 20: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



Map Document: (X:\AE\Exen\050200\03Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Taconite Tax Relief Area

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Legend

- Cities
- Highways
- Rivers
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

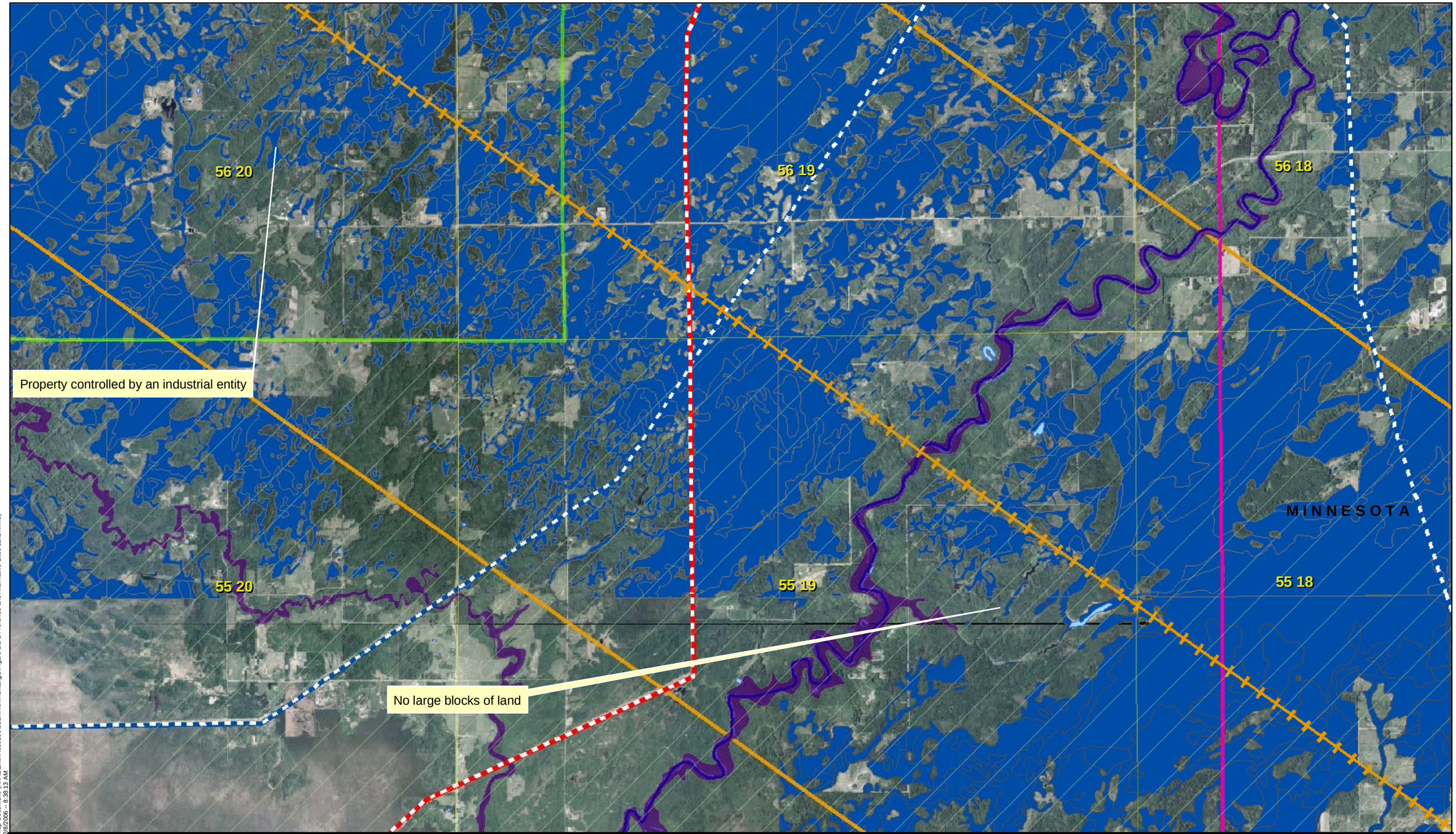
Source: ESRI, Excelsior Energy, and SEH.

Figure 21: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles



Map Document: (X:\AE\Exenr\05020003\Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Taconite Tax Relief Area

January 2007

Legend

- Cities
- Highways
- Rivers
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Source: ESRI, Excelsior Energy, and SEH.

Figure 22: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles

Alternative Site 12

58 20

58 19

58 18

Alternative Site 8

57 20

57 19

57 18

MINNESOTA

Iron Junction

Sufficient water unavailable; significant wetland impacts

Map Document: (X:\AE\Exenr\050200\03Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Taconite Tax Relief Area

January 2007

Legend

- Cities
- Highways
- Rivers
- TTRA
- BNSF Rail
- DMIR Rail
- DWP Rail
- HVTL_230_kV
- HVTL_115_kV
- HVTL_345_kV
- HVTL_500_kV
- Buffer of BNSF
- Buffer of DMIR
- Buffer of DWP
- Floodplains
- Iron Formation
- Lakes
- Wetlands

Source: ESRI, Excelsior Energy, and SEH.

Figure 23: TTRA Site Selection

UTM Zone 15 Meters
NAD83

N W E S

0 1 Miles

Site 1 IGCC Power Station Footprint

5718

5717

5616

5617

Map Document: (X:\AE\Exenr\05020003\Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Figure 24

January 2007

Legend

- fldwy_femapy3
- HVTL_500_kV
- HVTL_345_kV
- HVTL_115_kV
- HVTL_230_kV
- strm_majrvln2
- Buffer_of_TTRA_DMIR_4
- TTRA_DMIR
- Buffer_of_DWP_Rail
- DWP_Rail
- TTRA_CN
- TTRA_BNSF
- road_majorln3
- TTRA_Selection
- lakes
- Lower_48_Wetland_polygons

Source: Esri, Excelsior Energy, and SEH.

Site 1
Wetland Impacts

UTM Zone 15 Meters
NAD83

N W E S

0 830 Feet

Site 3 IGCC Power Station Footprint

Site 2 IGCC Power Station Footprint

5718

5717

8 9 10 11 12 7

17 16 15 14 13 18

Map Document: (X:\AE\Exenr\050200\03Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Figure 25

January 2007

Legend

- fldwy_femapy3
- HVTL_500_kV
- HVTL_345_kV
- HVTL_115_kV
- HVTL_230_kV
- strm_majrvln2
- Buffer_of_TTRA_DMIR_4
- TTRA_DMIR
- Buffer_of_DWP_Rail
- DWP_Rail
- TTRA_CN
- TTRA_BNSF
- road_majorln3
- TTRA_Selection
- lakes
- Lower_48_Wetland_polygons

Source: Esri, Excelsior Energy, and SEH.

Sites 2 & 3 Wetland Impacts

UTM Zone 15 Meters
NAD83

N W E S

0 830 Feet

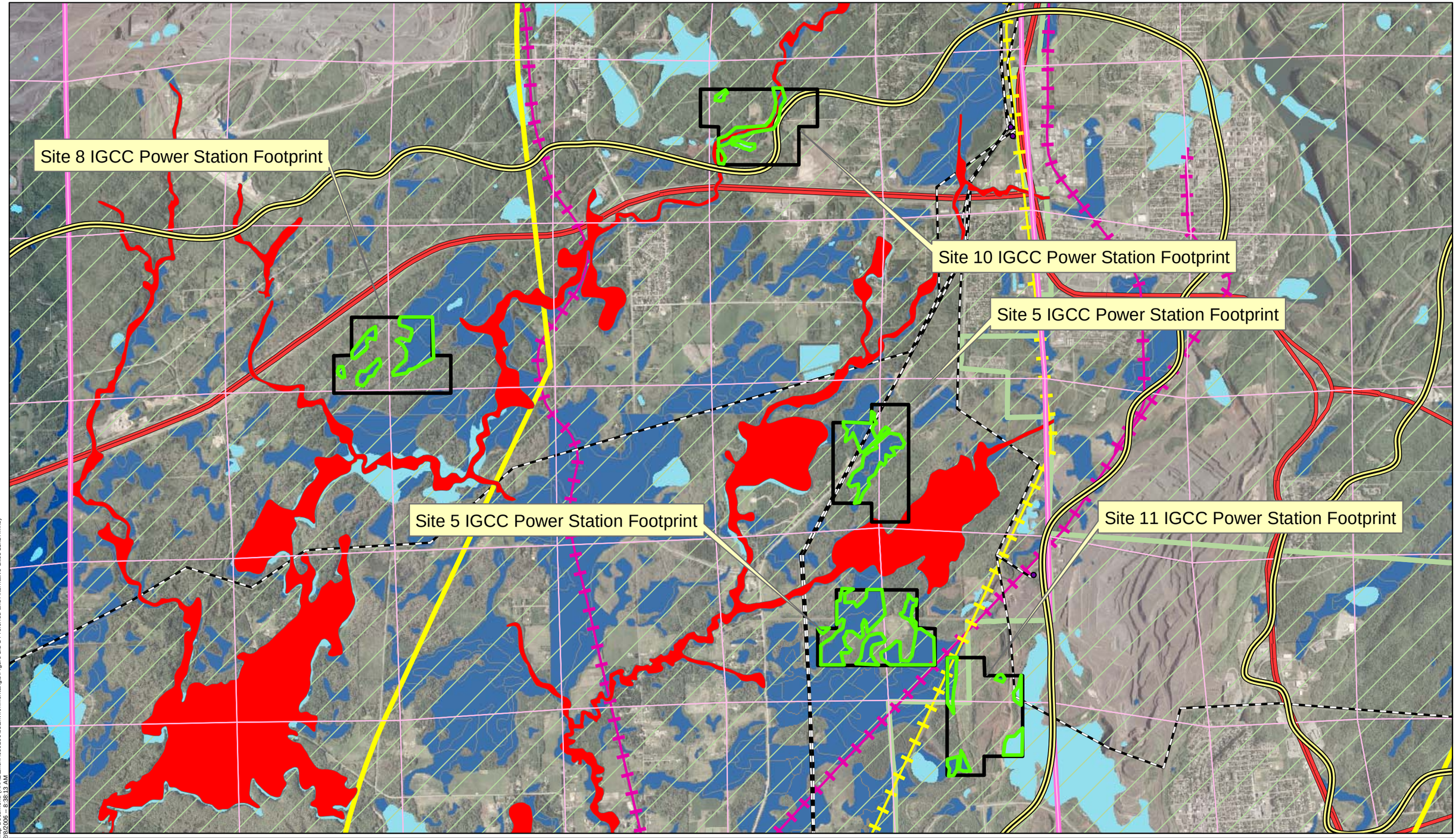

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Figure 26

January 2007

Legend

- fldwy_femapy3
- HVTL_500_kV
- HVTL_345_kV
- HVTL_115_kV
- HVTL_230_kV
- strm_majrvln2
- Buffer_of_TTRA_DMIR_4
- TTRA_DMIR
- Buffer_of_DWP_Rail
- DWP_Rail
- TTRA_CN
- TTRA_BNSF
- road_majorln3
- TTRA_Selection
- lakes
- Lower_48_Wetland_polygons

Sources: ESRI, Excelsior Energy, and SEH.

Sites 4, 5, 8, 10 & 11 Wetland Impacts

UTM Zone 15 Meters
NAD83

N W E S

0 1,500 Feet

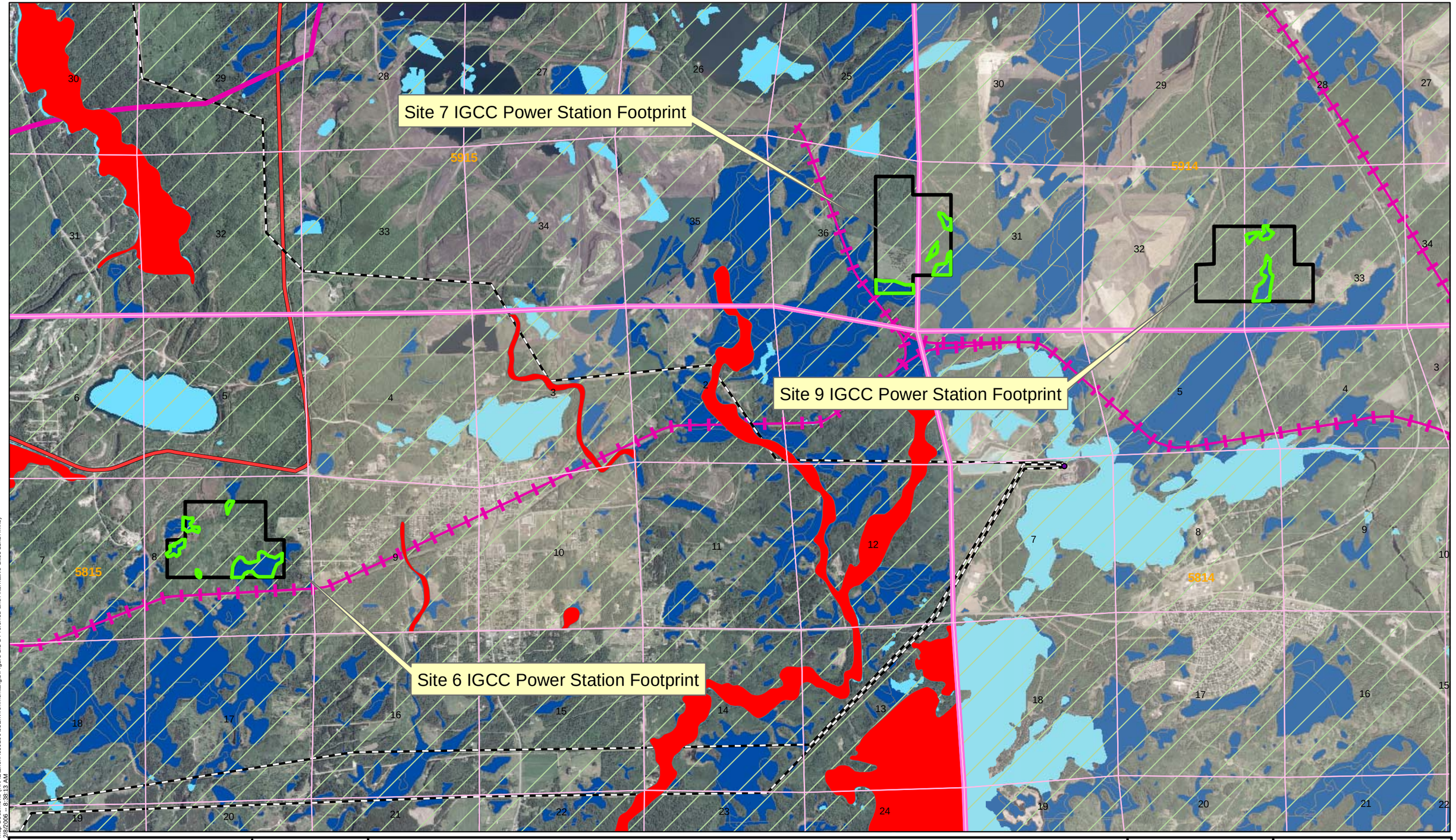

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Figure 27

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Legend

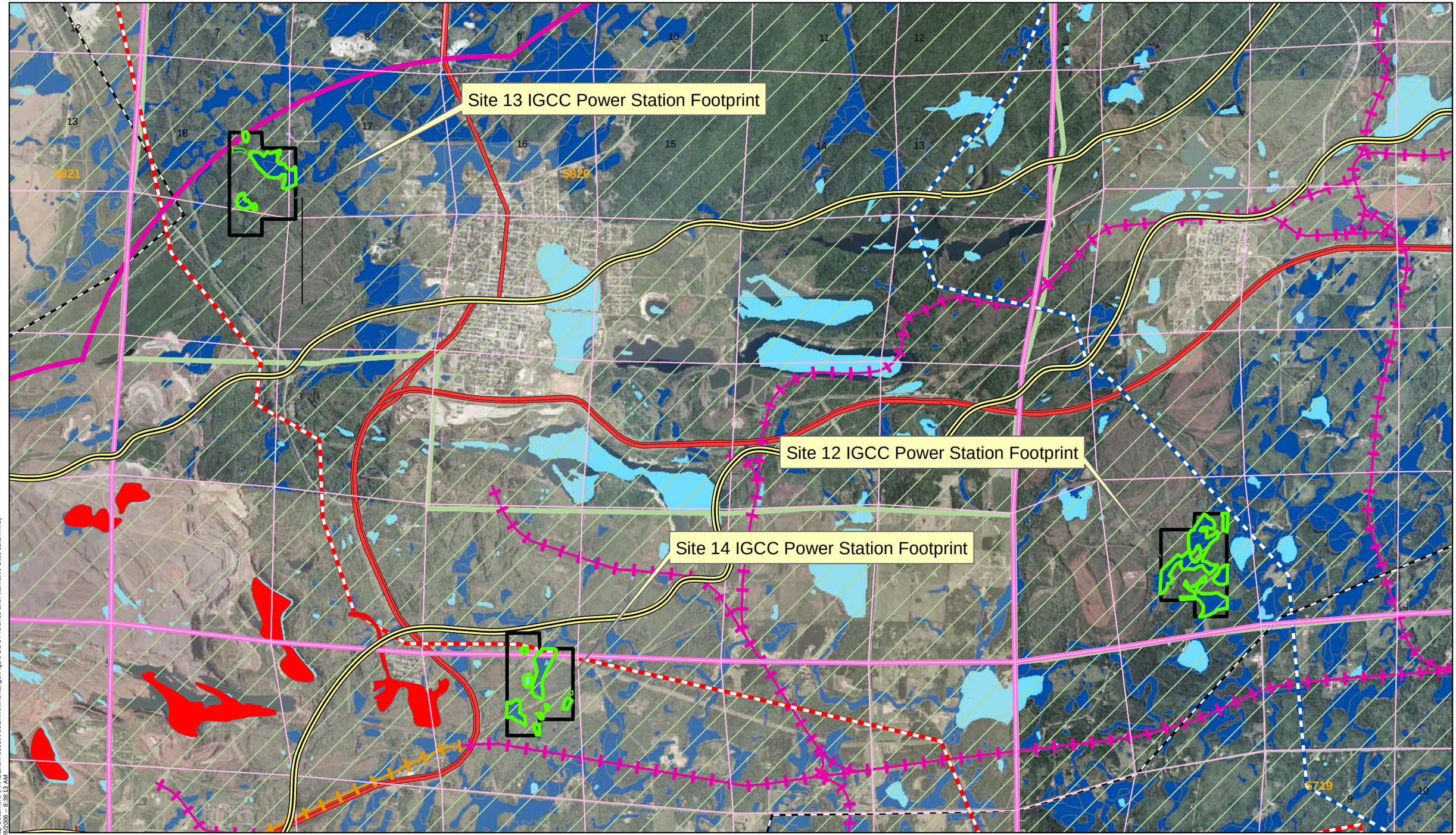
- fldwy_femapy3
- HVTL_500_kV
- HVTL_345_kV
- HVTL_115_kV
- HVTL_230_kV
- strm_majrvln2
- Buffer_of_TTRA_DMIR_4
- TTRA_DMIR
- Buffer_of_DWP_Rail
- DWP_Rail
- TTRA_CN
- TTRA_BNSF
- road_majorln3
- TTRA_Selection
- lakes
- Lower_48_Wetland_polygons

Sites 6, 7 & 9 Wetland Impacts

UTM Zone 15 Meters
NAD83

N W E S

0 1,500 Feet



Map Document: (X:\AE\Exenr\05020003\Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Figure 28

January 2007

Legend

- fldwy_femapy3
- HVTL_500_kV
- HVTL_345_kV
- HVTL_115_kV
- HVTL_230_kV
- strm_majrvln2
- Buffer_of_TTRA_DMIR_4
- TTRA_DMIR
- Buffer_of_DWP_Rail
- DWP_Rail
- TTRA_CN
- TTRA_BNSF
- road_majorln3
- TTRA_Selection
- lakes
- Lower_48_Wetland_polygons

Source: ESRI, Excelsior Energy, and SEH.

Site 12, 13 & 14 Wetland Impacts

UTM Zone 15 Meters
NAD83

N W E S

0 1,800 Feet

Site 15 IGCC Power Station Footprint

5624

5623

Map Document (X:\AE\Exenr\05020\03Environmental\gis\Figure 1.1-1 Preferred and Alternative Sites 11x17.mxd)
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Figure 29

January 2007

Legend

- fldwy_femapy3
- HVTL_500_kV
- HVTL_345_kV
- HVTL_115_kV
- HVTL_230_kV
- strm_majrvln2
- Buffer_of_TTRA_DMIR_4
- TTRA_DMIR
- Buffer_of_DWP_Rail
- DWP_Rail
- TTRA_CN
- TTRA_BNSF
- road_majorln3
- TTRA_Selection
- lakes
- Lower_48_Wetland_polygons

Source: ESRI, Excelsior Energy, and SEH.

Site 15
Wetland Impacts

UTM Zone 15 Meters
NAD83

N W E S

0 830 Feet

APPENDIX F2
Floodplain and Wetlands Assessment

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Table of Contents

F2.1 REGULATORY BACKGROUND

Executive Order 11988 *Floodplain Management* directs each Federal agency to evaluate the potential effects of its actions on floodplains and to ensure that flood hazards and floodplain management are considered in its planning programs. Executive Order 11990 *Protection of Wetlands* directs all Federal agencies to consider wetlands protection in decision making and to evaluate the potential impacts of any new construction proposed in a wetland. As stated in these Executive Orders, Federal agencies shall avoid direct or indirect support of development in a floodplain or new construction in a wetland wherever there is a practicable alternative. Department of Energy (DOE) requirements with respect to Executive Orders 11988 and 11990 are found in Title 10, Code of Federal Regulations (CFR) Part 1022, *Compliance with Floodplain and Wetland Environmental Review Requirements*.

Pursuant to 10 CFR 1022.11, DOE shall determine whether the Proposed Action would be located within a base floodplain (100-year) or critical action floodplain (500-year) and/or a wetland. In order to determine whether a Proposed Action would be located within a base or critical action floodplain, information available relative to site conditions from the following sources, as appropriate, would be reviewed: Flood Insurance Rate Maps (FIRM) or Flood Hazard Boundary Maps prepared by the Federal Emergency Management Agency (FEMA), information from a land-administering agency (e.g., Bureau of Land Management) or from other government agencies with floodplain-determination expertise [e.g., U.S. Army Corps of Engineers (USACE), Natural Resources Conservation Service (NRCS)], information contained in safety basis documents as defined at 10 CFR Part 830, and DOE environmental documents [e.g., National Environmental Policy Act (NEPA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documents]. To determine whether a Proposed Action would be located within a wetland, information available relative to site conditions from the following sources, as appropriate, would be reviewed: USACE "Wetland Delineation Manual" Wetlands Research Program Technical Report Y-87-1 (January 1987) or successor document, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) or other government-sponsored wetland or land use inventories, NRCS Local Identification Maps, U.S. Geological Survey Topographic Maps, and DOE environmental documents (e.g., NEPA and CERCLA documents). If there is no floodplain/wetland impact identified, the action may proceed without further consideration of the remaining procedures set forth below.

If a Proposed Action is located in or affects floodplains or wetlands, a floodplain/wetlands assessment shall be undertaken. DOE shall prepare the floodplain or wetland assessment concurrent with and included in the appropriate NEPA document to be used as a basis for determining floodplain and/or wetland impacts which may result from the implementation of a Proposed Action. In accordance with 10 CFR 1022.13, assessments shall consist of a description of the Proposed Action including a map showing its location with respect to the floodplain and/or wetland as well as a discussion of its positive and negative, direct and indirect, and long- and short-term impacts on the floodplain/wetland. In addition the assessment shall consider alternatives to the Proposed Action that avoid adverse impacts (including alternate sites, alternate actions, and no action) and evaluate measures that mitigate the adverse effects of actions in a floodplain or wetland.

Per DOE NEPA regulations, this Floodplain and Wetlands Assessment was written in support of an EIS for the Mesaba Energy Project. If DOE determines that there is no practicable alternative to implementing the Proposed Action in a floodplain, then a statement of findings must be prepared and can be included in the Final EIS (FEIS). The statement of findings (10 CFR 1022.14) shall include a brief description of the Proposed Action including a location map, an explanation indicating why the action is proposed to be located in the floodplain, a list of alternatives considered, a statement indicating whether

the Proposed Action conforms to applicable floodplain protection standards, and a brief description of steps to be taken to minimize potential harm to or within the floodplain.

F2.2 PROJECT DESCRIPTION

As described in Section 1.3 of the EIS, DOE's Proposed Agency Action is to provide a total of $36 million in co-funding through a cooperative agreement with Excelsior Energy, Inc. to demonstrate technologies under the Clean Coal Power Initiative (CCPI) Program. Excelsior proposes to design, construct, and operate the Mesaba Energy Project, which is a two-phased nominal 606 $MWe_{[net]}$ (1,212 $MWe_{[net]}$ total) Integrated Gasification Combined Cycle (IGCC) power plant to be located in northeastern Minnesota.

The DOE purpose and need for Agency Action (EIS Sections 1.4.1.2 and 1.4.2.2) are to commercially demonstrate IGCC technology, which includes advanced gasification and air separation systems, feedstock flexibility, improved environmental performance characteristics, and improved thermal efficiency. Excelsior's purpose and need for the proposed project are described in EIS Section 1.4.1.1 and 1.4.2.1 and Appendix F1. The proposed IGCC power plant would be designed for long-term commercial operation following a 12-month minimum demonstration period. The project would represent Phase I of a proposed two-phased Mesaba Generating Station; however, the EIS considers both phases of the proposed power plant as connected actions. DOE may also provide a loan guarantee pursuant to the Energy Policy Act of 2005 for a portion of the private sector financing of the project. As described in EIS Section 2.1.1.2, DOE's decision in the EIS relates to the co-funding of a project selected competitively in accordance with the objectives of the CCPI Program, and DOE has not participated in the identification or selection of alternative sites or corridors for the Mesaba Energy Project.

In conformance with Minnesota Rules described in EIS Section 1.5.2, Excelsior has proposed two alternative locations, the West and East Range Sites, for construction of the Mesaba Energy Project in the Taconite Tax Relief Area. Excelsior's process for screening candidate sites and selecting the potential alternative sites is described in EIS Appendix F1. Both of the sites are currently undeveloped, unoccupied, wooded lands located in the immediate vicinity of former iron ore mining operations. The West Range Site is located on approximately 1,260 acres of land owned by RGGS Land & Minerals Ltd. within the city limits of Taconite in Itasca County, Minnesota (see Figure 2.3-1 of the EIS). The East Range Site is located on approximately 810 acres of land owned by Cliffs-Erie, LLC within the western boundary of Superior National Forest and the city limits of Hoyt Lakes in St. Louis County, Minnesota (see Figure 2.3-5 of the EIS). The features of Excelsior's proposed project at the West Range Site are described and illustrated in EIS Section 2.3.1. The features at the East Range Site are described and illustrated in EIS Section 2.3.2.

F2.3 FLOODPLAIN AND WETLAND IMPACTS

This section provides a discussion of the potential impacts of the Proposed Action and alternatives, including impacts that would be associated with each of the project proponent's site alternatives.

F2.3.1 Basis for Assessing Impacts

A floodplain or wetlands assessment is required to discuss the positive and negative; direct and indirect; and long- and short-term effects of the Proposed Action on the floodplain and/or wetlands (10 CFR 1022.13(a)(2)). In addition, the effects on lives and property and on natural and beneficial values of floodplains must be evaluated. For actions taken in wetlands, the assessment should evaluate the effects of the Proposed Action on the survival, quality, and function of the wetlands. If DOE finds no practicable

alternative to locating activities in floodplains or wetlands, DOE must design or modify its actions to minimize potential harm to these resources (10 CFR 1022.14(a)).

For the purposes of this Floodplain and Wetlands Assessment, the region of influence for direct impacts to floodplains and wetlands includes the areas of land disturbance. The region of influence for indirect impacts includes those floodplain and wetland areas adjacent to locations that would experience direct impacts. For the Mesaba Energy Project, indirect impacts are expected to be of lesser consequence than direct impacts, because all land disturbing activities would be performed in accordance with appropriate regulatory requirements and BMPs for sediment and erosion control and pollution prevention. Of most importance for avoiding or minimizing impacts on floodplains and wetlands is the careful pre-planning of activities and investigations that aim to identify and assess potential impacts before they occur.

The potential for a Proposed Action to have an adverse impact on floodplains and wetlands has been evaluated by DOE based on whether the Proposed Action located at either alternative site would cause any of the conditions listed in Table F2-1.

Table F2-1. Approach to Impact Assessment

Resource	Basis for Assessing Adverse Impact
Floodplains	Cause construction of aboveground facilities in or otherwise impede or redirect flows in the 100-year floodplain or other flood hazard areas that would adversely affect the qualities or functions of jurisdictional floodplains. Substantially alter flood water discharges and adversely affect drainage patterns, flooding, and/or erosion and sedimentation causing risk to human lives and property.
Wetlands	Cause construction in (dredging or filling of) wetlands or otherwise alter drainage patterns that would adversely affect the qualities or functions of jurisdictional wetlands.

F2.3.2 Floodplains

For the purposes of this assessment, the DOE No Action Alternative is assumed to be equivalent to a "No Build" Alternative (see EIS Section 2.1.1.2). Under the No Action Alternative, there would be no changes to water resources in the project area and floodplains would continue to function in their current form.

Although for its Proposed Action, DOE has not participated in the identification or selection of alternative sites or corridors for the Mesaba Energy Project, DOE evaluated the comparative impacts of Excelsior's proposed project at two alternative sites in the EIS and in this floodplain assessment. The following subsections provide descriptions of potential impacts to floodplains associated with both of Excelsior's site alternatives under consideration for the Proposed Action. The locations of floodplain areas were determined with the use of FEMA Flood Insurance Rate Maps (see EIS Sections 3.6.2.1 and 3.6.2.2 for information on the specific FEMA Flood Insurance Rate Maps that were consulted). Maps showing the locations of floodplains in relation to the West and East Range Sites are provided in Section 3.6 (Floodplains) of this EIS (Figures 3.6-1 and 3.6-2). Potential impacts of the Mesaba Energy Project are described in EIS Section 4.6.

F2.3.2.1 West Range Site Floodplain Impacts

There would be no anticipated impacts to floodplains for the West Range Site with respect to the placement of the Mesaba IGCC Power Plant, the HVTL Alternatives, the Cooling Tower Blowdown Pipelines, Segments 2 and 3 of the Process Water Supply Pipelines, potable water and sewer pipelines, or the transportation corridors because these structures would be situated outside of the boundaries of any 100-year floodplain areas. No 500-year floodplains have been identified that could be impacted by the implementation of the Proposed Action at the West Range Site. No impacts would be expected to result in any locations considered high-hazard areas (portions of riverine floodplains nearest the source of flooding that are frequently flooded and where the likelihood of flood losses and adverse impacts on the natural and beneficial values served by floodplains is greatest).

Proposed utilities that could potentially affect floodplains due to their siting within or near 100-year floodplains include: Natural Gas Pipeline Alternatives 1, 2, and 3, and the Process Water Supply Pipeline – Segment 1 (Lind Pit to Canisteo Pit). These linear corridors are described and illustrated in EIS Section 2.3.1.

West Range Natural Gas Pipeline Alternatives 1, 2, and 3

The Natural Gas Pipeline Alternatives 1, 2, and 3 would each cross at least one 100-year floodplain area. Alternative 1 would cross the Swan River and an adjacent 100-year floodplain. Alternative 2 would cross both the Swan River and the Prairie River and adjacent 100-year floodplains. Alternative 3 would cross the Prairie River and adjacent 100-year floodplains.

During the construction phase of the Mesaba Energy Project there may be some temporary impacts to the floodplain areas caused by the installation of necessary pipelines. These temporary impacts may result from the presence of construction equipment, materials stockpiles, etc. being temporarily situated within the boundaries of the 100-year floodplain areas, which could redirect flood flows during a major storm event. However, these impacts would be minimized through the use of appropriate engineering procedures and BMPs, which would ensure that river and stream flows be maintained during construction. For example, the natural gas pipelines would be directionally drilled beneath these and all other water body crossings at approximately 100 feet from the edge of each water body. This method would ensure that no permanent impacts would occur to floodplains from the placement of structures within water bodies that could divert or otherwise impede stream flows. Upon completion of construction activities within the floodway, the construction equipment and stockpiles would be removed, and contours would be restored to their original grade and seeded, stabilized, or planted with plants native to the region.

West Range Process Water Supply Pipeline – Segment 1 (Lind Pit to Canisteo Pit)

Segment 1 of the Process Water Supply Pipeline would be located in relatively close proximity to a 100-year floodplain area adjacent to the Prairie River. There would be no anticipated impacts associated with this pipeline due to it being placed outside of the floodplain as well as it not crossing any rivers or streams associated with the neighboring floodplain area. All construction equipment and materials would be kept out of the floodplain area.

F2.3.2.2 East Range Site Floodplain Impacts

There would be no anticipated impacts to floodplains for the East Range Site with respect to the placement of the Mesaba IGCC Power Plant, the Process Water Supply Pipelines, potable water and sewer pipelines, or the transportation corridors, because these structures would be situated outside of the

boundaries of any 100-year floodplain areas. No 500-year floodplains have been identified that could be impacted by the implementation of the Proposed Action at the East Range Site. No impacts would be expected to result in any locations considered high-hazard areas (portions of riverine floodplains nearest the source of flooding that are frequently flooded and where the likelihood of flood losses and adverse impacts on the natural and beneficial values served by floodplains is greatest).

Proposed utilities that could potentially affect floodplains due to their potential placement within or near 100-year floodplains include HVTL Alternatives 1 and 2 and the Natural Gas Pipeline Alternative 1. These linear corridors are described and illustrated in EIS Section 2.3.2.

East Range HVTL Alternatives 1 and 2

The HVTL Alternative 1 would cross the Partridge River, Cedar Island Lake, the East Two River, and 100-year floodplains adjacent to each of these surface waters. The HVTL Alternative 2 would cross the Partridge River, the Embarrass River, the East Two River, and 100-year floodplains adjacent to each of these surface waters.

Each of the potential HVTL alignments would utilize existing HVTL corridors with negligible alterations required to the ROWs. HVTL Alternative 1 would utilize the existing 38 Line corridor and HVTL Alternative 2 would utilize a combination of the existing 39 and 37 Lines corridors. No permanent impact on flood elevations would occur, because permanent structures would be limited to HVTL towers that have small footprints and these structures would be located outside of floodplains to the extent practicable.

East Range Natural Gas Pipeline Alternative 1

The Natural Gas Pipeline Alternative 1 would cross 100-year floodplains along the Partridge River and an area between Fourth Lake and Esquagama Lake. As previously described for the West Range Site (Section F2.3.2.1), the construction of pipelines may cause some temporary impacts to floodplains, however these impacts would be minimized through the use of appropriate engineering procedures and BMPs to maintain existing river and stream flows. Following construction activities, efforts would be taken to restore floodway contours as closely as possible to their original condition as well as the right of ways (ROWs). Therefore, no permanent impacts to floodplains would be anticipated.

F2.3.3 Wetlands

For the purposes of this assessment, the DOE No Action Alternative is assumed to be equivalent to a "No Build" Alternative (see EIS Section 2.1.1.2). Under the No Action Alternative, there would be no changes to water resources in the project area and wetlands would continue to function in their current form.

Although for its Proposed Action, DOE has not participated in the identification or selection of alternative sites or corridors for the Mesaba Energy Project, DOE evaluated the comparative impacts of Excelsior's proposed project at two alternative sites in the EIS and in this wetlands assessment. The following subsections provide descriptions of potential impacts to wetlands associated with both of Excelsior's site alternatives under consideration for the Proposed Action. This section summarizes these potential impacts on wetlands due to construction and operation activities, including how such impacts would be minimized or avoided due to construction practices, or where temporary impacts may be restored.

Wetland areas were determined through the use of USFWS NWI mapping. Also, detailed wetland delineations were performed by Excelsior's contractors in the areas of the potential power plant site

footprints and the immediate vicinity. Land access restrictions have not allowed for field delineations to be performed along the utility and transportation corridors. DOE evaluated the methods, results, and conclusions of the wetland delineations performed by the contractors.

Whenever possible, wetland habitats are characterized based on the USFWS Circular 39 classification scheme as described in Table F2-2. Some wetland areas are described as a complex of different wetland types (e.g., Type 3/6/8).

Table F2-2. Wetland Types and Definitions

Wetland Type	Definition
Type 1 – Seasonally flooded basin or flat	Soil is covered with water or is waterlogged during variable seasonal periods but usually is well-drained during much of the growing season. Vegetation varies greatly according to season and duration of flooding from bottomland hardwoods (floodplain forests) to herbaceous plants.
Type 2 – Wet meadow	Soil is usually without standing water during most of the growing season but is waterlogged within at least a few inches of surface. Meadows may fill shallow basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. Other wetland plant community types include low prairies, sedge meadows, and calcareous fens.
Type 3 – Shallow marsh	Soil is usually waterlogged early during the growing season and may often be covered with as much as 6 inches or more of water. These marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. These are common as seep areas on irrigated lands. Vegetation includes grass, bulrush, spikerush, and various other marsh plants such as cattail, arrowhead, pickerelweed, and smartweed.
Type 4 – Deep marsh	Soil is usually covered with 6 inches to 3 feet or more of water during growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattail, reeds, bulrush, spikerush, and wild rice. In open areas, pondweed, naiad, coontail, water-milfoil, waterweed, duckweed, waterlily, or spatterdock may occur.
Type 5 – Shallow open water	Shallow ponds and reservoirs are included in this type. Water is usually less than 10 feet deep and fringed by a border of emergent vegetation similar to areas of Type 4.
Type 6 – Shrub swamp	Soil is usually waterlogged during growing season and is often covered with as much as 6 inches of water. These occur mostly along sluggish streams and occasionally on flood plains. Vegetation includes alder, willow, buttonbush, dogwood, and swamp-privet.
Type 7 – Wooded swamp	Soil is waterlogged at least within a few inches of surface during growing season and is often covered with as much as 1 foot of water. These occur mostly along sluggish streams, on old riverine oxbows, on flat uplands, and in ancient lake basins. Forest vegetation includes tamarack, arborvitae, black spruce, balsam fir, red maple, and black ash. Deciduous swamps frequently support beds of duckweed and smartweed. Other wetland plant community types include lowland hardwood swamps and coniferous swamps.
Type 8 – Bogs	Soil is usually waterlogged. These occur mostly in ancient lake basins, on flat uplands and along sluggish streams. Vegetation is woody or herbaceous or both, usually on a spongy covering of mosses. Typical plants are heath shrub, sphagnum moss, and sedge. In the North, leatherleaf, Labrador tea, cranberry, and cottongrass are often present. Scattered, often stunted, black spruce and tamarack may occur.

Note: The eight wetland types described in this table include all wetland types defined in the USFWS Circular 39 document that are recognized as existing in Minnesota.

Source: Shaw and Fredine, 1956 (USFWS Circular 39)

Maps showing the locations of wetlands in relation to the West and East Range Sites are provided in Section 3.7 (Wetlands) of this EIS (Figures 3.7-1 and 3.7-2).

Potential indirect impacts would be common to any wetland area adjacent to a location that would experience direct impacts. The main potential indirect impacts that could occur would include increased sedimentation into undisturbed wetland areas that could result from construction activities in neighboring locations as well as changes in local hydrology, resulting in increased surface runoff in some areas, while decreasing surface runoff and subsurface flows in other areas. The utilization of standard engineering design measures and BMPs would reduce indirect impacts to adjacent wetlands.

The wetland acreages impacted by the project as summarized in Sections F2.3.3.1, F2.3.3.2 and in Section 4.7 represent the maximum potential impacts. In DOE's fulfillment of the requirements of Executive Order 11990 as articulated in 10 CFR Part 1022 these impacts would be further minimized and mitigated as described in Section F2.3.3.4.

F2.3.3.1 West Range Site Wetland Impacts

Table F2-3 and the following subsections summarize the estimated total wetland impacts in the temporary and permanent ROWs for the West Range Site and the associated utility and transportation corridors. Total permanent impacts to wetlands would consist of a range of 89.3 to 181.2 acres of wetlands lost. The final impact acreage would be dependent upon the selected utility and transportation corridor alternatives as well as the configuration of the interior of the rail line center loop. Alternative utility and transportation corridors were developed in order to provide a greater range of possibilities in terms of deciding which corridors would cause the least amount of environmental impacts.

West Range IGCC Power Station

Permanent wetland losses for the West Range IGCC Power Station Footprint are estimated at 31 acres, including Phase 1 wetland losses estimated at 17.3 acres and Phase II wetland losses estimated at 13.6 acres. These wetlands are primarily Type 3/7 or Type 7 basins and it is the preliminary opinion of DOE that most of these basins are isolated; however, USACE has not made a final determination of wetland jurisdiction.

Type 7 wetlands are the most abundant wetland type present within the project limits and would incur the most impacts for both phases of the IGCC Power Station. Phase I would have the majority of wetland impacts for the facility, most of which are Type 7 wetlands. The Phase II Development would involve less wetland impact acreage overall, but would include impacts to Type 3 and Type 3/6/8 (bog habitat) wetlands.

Table F2-3. Summary of Total Temporary and Permanent ROW Wetland Impacts for West Range Site and Associated Utility and Transportation Corridors

Project Alternative	Total Wetland Impacts (acres)		
	Temporary ROW		Permanent ROW
	Temporary Impacts in ROW	Permanent Impacts in ROW	Permanent Impacts in ROW
IGCC Power Station	n/a [1]	n/a [1]	30.96
HVTL Alternative 1	n/a [1]	n/a [1]	0.01 [2]
HVTL Alternative 1A	n/a [1]	n/a [1]	0.01 [2]
HVTL Phase II	n/a [1]	n/a [1]	0.03 [2]
Gas Pipeline 1	24.69	0	17.47
Gas Pipeline 2	28.86	0	18.13
Gas Pipeline 3	12.82	0	9.12
Cooling Tower Blowdown Outfall 1 (IGCC Power Station to Canisteo Pit)	20.38	0	13.60
Cooling Tower Blowdown Outfall 2 (IGCC Power Station to Holman Lake)	5.86	0	4.07
Process Water Segment 1 (Lind Pit to Canisteo Pit)	0	0	0
Process Water Segment 2 (Canisteo Pit to West Range Site)	5.48	0	3.73
Process Water Segment 3 (Gross-Marble Pit to Canisteo Pit)	6.17	0	3.79
Railroad Alternative 1A and Center Loop	0 [3]	26.45 [3]	77.08 (includes 64.85 within center loop) [4]
Railroad Alternative 1B and Center Loop	0 [3]	18.11 [3]	64.23 (includes 52.23 within center loop) [4]
Potable Water and Sewer Pipelines	4.48	0	1.79
Roads	9.72	0	5.67
Estimated Range of Total Permanent Wetland Impacts [5]			**89.3 – 181.2**

[1] Temporary construction areas for the Mesaba Generating Station or temporary ROW for the HVTL corridors are not defined for the project area; therefore temporary wetland impacts are not anticipated for these project alternatives.
[2] Permanent impacts in the permanent ROW for HVTL is limited to placement of new power poles.
[3] Impacts in railroad temporary ROW are permanent impacts due to grading in the construction limits, which should be included with total permanent wetland impacts for mitigation purposes.
[4] The impacts for the rail loops could be reduced upon completion of final design specifications associated with the rail corridor.
[5] The range of impact values represents the differing total acreages that could result, which is dependent upon the project alternatives that are ultimately selected and the configuration of the interior of the selected rail line center loop (the low range assumes no center loop impacts and the high range assumes complete center loop impacts).

Source: Excelsior, 2006b

West Range HVTL Alternative 1

For HVTL Alternative 1, an estimate of 0.01 acres of Types 2, 3, 6, 7, and 8 wetlands would be permanently lost for placement of new utility poles. To the extent practicable, wetlands would be avoided for installation of the HVTL, and construction activities would be planned during the winter months to further minimize direct impacts to wetlands. Permanent wetland impacts would be limited to those areas where HVTL utility poles would be placed within wetland habitat.

Tree and shrub clearing in wetlands would be initiated along new areas of ROW to be established for HVTL Alternative 1. An estimated total of 30.2 acres of trees and shrubs would be cleared in Types 6, 7, and 8 wetlands. No vegetation clearing would be anticipated in Type 1-5 wetlands (i.e., herbaceous dominated vegetation in seasonal basins, wet meadow, shallow marsh, or open water wetlands). Direct impacts to these wetlands would not be anticipated because no stump grubbing, excavation, or fill is planned for the areas to be cleared of woody vegetation. Ultimately some wetland areas may be converted to different types (e.g., Type 6 scrub-shrub habitat may convert to Type 2/3 wet meadow/shallow marsh); however, direct loss of wetlands would not be anticipated. In addition, tree clearing activities would be completed during the winter months, thereby avoiding direct impacts to the wetlands from equipment and the bird nesting period which is in compliance with the Federal Migratory Bird Treaty Act. In the future and beyond the scope of this project, maintenance of the ROW would likely include clearing of trees and shrubs that re-establish in wetlands, but maintenance would be completed during the winter months to avoid direct impacts on wetlands or to potential nesting birds.

West Range HVTL Alternative 1A

For HVTL Alternative 1A, an estimate of 0.01 acres of Types 2, 3, 5, 6, 7, and 8 wetlands would be permanently lost for placement of new utility poles. To the extent practicable, wetlands would be avoided for installation of the HVTL, and construction activities would be planned during the winter months to further minimize direct impacts to wetlands. Permanent wetland impacts would be limited to those areas where HVTL utility poles would be placed within wetland habitat.

Similar to HVTL Alternative 1, tree and shrub clearing in wetlands would be initiated along new areas of ROW to be established for HVTL Alternative 1A. An estimated total of 24.5 acres of trees and shrubs would be cleared in Types 6, 7, and 8 wetlands. No vegetation clearing would be anticipated in Type 1-5 wetlands (i.e., herbaceous dominated vegetation in seasonal basins, wet meadow, shallow marsh, or open water wetlands). Direct impacts to these wetlands would not be anticipated because no stump grubbing, excavation, or fill is planned for the areas to be cleared of woody vegetation. Ultimately, some wetland areas may be converted to different types (e.g., Type 6 scrub-shrub habitat may convert to Type 2/3 wet meadow/shallow marsh); however, direct loss of wetlands would not be anticipated. In addition, tree clearing activities would be completed during the winter months, thereby avoiding direct impacts to the wetlands from equipment and the bird nesting period which is in compliance with the Federal Migratory Bird Treaty Act. In the future and beyond the scope of this project, maintenance of the ROW would likely include clearing of trees and shrubs that re-establish in wetlands, but this would be completed during the winter months avoiding direct wetland impacts by equipment or to potential nesting birds.

West Range HVTL Phase 2

For HVTL Phase 2, an estimate of 0.03 acres of Types 2, 3, 6, 7, and 8 wetlands would be permanently lost for placement of new utility poles. To the extent practicable, wetlands would be avoided for installation of the HVTL, and construction activities would be planned during the winter months to further

minimize direct impacts to wetlands. Permanent wetland impacts would be limited to those areas where HVTL utility poles would be placed within wetland habitat.

No tree and shrub clearing in wetlands would be anticipated for HVTL Phase 2 as this alternative is proposed along an existing utility corridor maintained by Minnesota Power. In the future and beyond the scope of this project, maintenance of the ROW would likely include clearing of trees and shrubs that re-establish in wetlands, but this would be completed during the winter months avoiding direct wetland impacts by equipment or to potential nesting birds.

West Range Natural Gas Pipeline Alternative 1

Wetlands within the Natural Gas Pipeline Alternative 1 corridor include a total of 24.69 acres of Types 1, 2, 3, 6, and 7 wetland habitats in the proposed temporary ROW. For the permanent ROW, wetland losses would be 17.5 acres. Temporary impacts are needed for construction limits, but would be mitigated by restoring the habitat upon completion of construction activities. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the pipeline corridor.

The Natural Gas Pipeline Alternative 1 would cross approximately 133 linear feet of surface waters, not including adjacent wetland habitat. For water crossings, the natural gas pipeline would be directionally drilled under water bodies starting at approximately 100 feet from the edge of each bank. This method would minimize impacts to wetlands associated with water crossings. Impacts to wetlands adjacent to water bodies include 1.3 acres in the temporary ROW and 0.9 acres of wetland losses in the permanent ROW. The remainder of the natural gas pipeline would include open trench installation. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

West Range Natural Gas Pipeline Alternative 2

Wetlands within the Natural Gas Pipeline Alternative 2 corridor include a total of 28.9 acres of Types 2, 3, 6, 7, and 8 wetland habitats in the proposed temporary ROW. For the permanent ROW, wetland losses would be 18.1 acres. Temporary impacts are needed for construction limits, but would be mitigated by restoring the habitat upon completion of construction activities. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the pipeline corridor.

The Natural Gas Pipeline Alternative 2 would cross approximately 313 linear feet of surface waters, not including adjacent wetland habitat. For water crossings, the natural gas pipeline would be directionally drilled under water bodies starting at approximately 100 feet from the edge of each bank, which would minimize impacts to wetlands associated with water crossings. Impacts to wetlands adjacent to water bodies include 2.2 acres in the temporary ROW and 1.5 acres of wetland losses in the permanent ROW. The remainder of the natural gas pipeline would include open trench installation. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

West Range Natural Gas Pipeline Alternative 3

Wetlands within the Natural Gas Pipeline Alternative 3 corridor include a total of 12.8 acres of Types 2, 3, 4, 6, 7, and 8 wetland habitats in the proposed temporary ROW. For the permanent ROW, wetland losses would be 9.1 acres. Temporary impacts are needed for construction limits, but would be mitigated by restoring the habitat upon completion of construction activities. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the pipeline corridor.

The Natural Gas Pipeline Alternative 3 would cross approximately 236 linear feet of surface waters, not including adjacent wetland habitat. For water crossings, the natural gas pipeline would be directionally drilled under water bodies starting at approximately 100 feet from the edge of each bank, which would minimize impacts to wetlands associated with water crossings. Impacts to wetlands adjacent to water crossings include 2.3 acres in the temporary ROW and 1.6 acres of wetland losses in the permanent ROW. The remainder of the natural gas pipeline would include open trench installation. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

West Range Process Water Supply Pipeline

Segment 1 – Lind Pit to Canisteo Pit

No wetlands have been identified for Process Water Supply Pipeline Segment 1, therefore wetland impacts are not anticipated due to construction or operation activities. Field investigations would be performed prior to construction activities to confirm that impacts would not occur.

Segment 2 – Canisteo Pit to West Range Site

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed Process Water Supply Pipeline Segment 2 corridor include a total of 5.5 acres of Types 3/6/8, 6, and 7 wetland habitat in the 150-foot temporary ROW. For the 100-foot permanent ROW, wetland losses would be 3.7 acres. There are no water crossings associated with the Process Water Supply Pipeline Segment 2. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the Process Water Supply Pipeline Segment 2 corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

Segment 3 – Gross-Marble Pit to Canisteo Pit

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Process Water Supply Pipeline Segment 3 would include a total of 6.2 acres of Types 4, 5, 6, 6/7, 7, and 8 wetland habitat impacts in the 150-foot temporary ROW. For the 100-foot permanent ROW, wetland losses would be 3.8 acres. Type 6 scrub-shrub wetland would sustain the greatest impacts due to this alternative. There are no water crossings associated with the Process Water Supply Pipeline Segment 3. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the Process Water Supply Pipeline Segment 3 corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

West Range Cooling Tower Blowdown Outfall 1 (Facility to Canisteo Pit)

Wetland impacts would be minimized to the maximum extent feasible by routing the blowdown pipeline along existing and proposed roadways, railroads, and utility ROWs. The blowdown alignment would include a total of 20.4 acres of Types 6, 7, and 8 wetland habitat impacts in the temporary ROW. For the permanent ROW, wetland losses would be 13.6 acres. The blowdown pipeline would be placed in wetlands and below water bodies through open-cut trenching. There are no water crossings (i.e., streams, rivers, or lakes) associated with this alignment for the blowdown pipeline.

Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the pipeline corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

West Range Cooling Tower Blowdown Outfall 2 (Facility to Holman Lake)

Wetland impacts would be minimized to the maximum extent feasible by routing the blowdown pipeline along existing and proposed roadways, railroads, and utility ROWs. The blowdown alignment would include a total of 5.9 acres of Types 3/6/8, 6, 7, and 8 wetland habitat impacts in the temporary ROW. For the permanent ROW, wetland losses would be 4.1 acres. The blowdown pipeline would be placed in wetlands and below water bodies through open-cut trenching.

There are two water crossings associated with the Cooling Tower Blowdown Outfall 2 pipeline alignment. Wetland impacts include the total length of the crossing through water bodies and adjacent wetlands. The total length of water crossings would be 6 linear feet over water, and a total of 50 linear feet in the adjacent wetlands. Impacts to wetlands due to the water crossings are based on a 150-foot temporary ROW and 100-foot permanent ROW. Wetland habitats associated with the water crossings that would be affected include 7,500 square feet (0.2 acres) in the temporary ROW and 5,000 square feet (0.1 acres) of wetland losses in the permanent ROW.

Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the pipeline corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

West Range Potable Water and Sewer Pipelines

Wetland impacts would be minimized to the maximum extent feasible by routing the sewer and water lines adjacent to the process water lines, which would be placed along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed sewer and water corridor would include a total of 4.5 acres to Types 3/6/8, 6, and 7 wetland habitats in the 100-foot temporary ROW. For the 40-foot permanent ROW, wetland losses would be 1.8 acres. No water crossings are associated with the water and sewer lines.

West Range Rail Line Alternative 1A

Siting for the railroad alternatives first considered avoidance of both Dunning and Big Diamond Lakes. Preliminary alignments for the railroad included a design that would have required filling as much as one quarter of Big Diamond Lake to maintain railway design standards for grades and turning radii; however this was removed from further consideration based on the extent of potential impact. At the southeast corner of Big Diamond Lake, Alternative 1A was shifted away from Big Diamond Lake to reduce direct impacts on the lakebed and any surrounding aquatic habitat.

Wetland impacts from rail alignments in the vicinity of the West Range Site are essentially unavoidable, because railway design standards require level grades and wide turning radii. The railroad alternatives are the only utility or transportation corridors that have established construction limits, which may be considered as temporary ROW. For the West Range Railroad Alternative 1A, the construction limits (temporary ROW) vary in width from 80 to 450 feet. The permanent ROW for the railroad would be an established 100-foot ROW, which includes the ROW width needed for the center loop.

Permanent wetland impacts within the railroad alternatives would occur within the construction limits (temporary ROW) and the center loop. There would be no temporary wetland impacts anticipated for the railroad alternatives due the necessary grading required for the railroad bed; therefore, those impacts would all be considered permanent. Permanent wetland losses within the construction limits (temporary ROW) would include 26.5 acres. Approximately 77.1 acres of permanent wetland losses would occur in the permanent ROW; of this, an estimated 64.9 acres of Type 7 (wooded swamp) wetlands would be within the center loop of the rail spur for Alternative 1A. Therefore, maximum impacts to wetlands could be 103.5 acres lost to Types 3, 3/6, 3/7/8, 3/6/8, 6, 6/7, and 7 wetlands. The impacts estimated for the center loop may be reduced upon completion of final design when the layout within the center loop is determined. No water crossings are associated with Railroad Alternative 1A.

West Range Rail Line Alternative 1B

For the West Range Railroad Alternative 1B, the construction limits (temporary ROW) vary in width from 60 to 760 feet. The permanent ROW for the railroad would be an established 100-foot ROW, which includes the ROW width needed for the center loop. Permanent wetland losses within the construction limits (temporary ROW) would include 18.1 acres. Approximately 64.2 acres of permanent wetland losses would occur in the permanent ROW; of this, an estimated 52.2 acres of Type 7 (wooded swamp) wetlands would be within the center loop of the rail spur for Alternative 1A. Therefore, maximum impacts to wetlands could be 82.3 acres lost to Types 3, 3/6, 3/7, 5, 5/6/7, 6, 6/7, 6/8, and 7 wetland habitats. The impacts estimated for the center loop may be reduced upon completion of final design when the layout within the center loop is determined. No water crossings are associated with Railroad Alternative 1B.

West Range Access Roads

For the design of access roads, corridors were identified that would minimize overall impacts, considering grading requirements, existing topography, accessible properties, and presence of wetlands, while achieving the access needs for the West Range Site. Although there would be impacts to wetlands due to the placement of corridors, these impacts would be balanced during the overall site grading requirements. In some instances it would become more feasible to impact a small area of wetland than attempt grading hillsides or steep slopes.

Access Roads 1 and 2 that would serve the facility would impact a total of 9.7 acres of Types 1/2/3/5, 3/6/8, 4, 6, 6/7, 7, and 8 wetlands in the 200-foot temporary ROW. For the 12-foot permanent ROW, wetland losses would be 5.7 acres. The largest wetland impacts for roads would be within the large wetland complex near the southern boundary of the West Range Site. No water crossings are associated with the roads.

Because Excelsior has included both road alignments (Access Roads 1 and 2) within its plan for highway access to the power plant at the West Range Site, the impacts of road construction are the combined impacts for both roads. Although Access Road 1 would consist of the realignment of CR 7 by Itasca County as a separate action, it is considered a connected action by DOE to ensure that all potential impacts from the access roads are addressed. In the event that the realignment of CR 7 by Itasca County would not proceed, the effect of constructing only Access Road 2 from the power plant to the existing alignment of CR 7 would likely reduce the wetland impacts by a roughly proportional amount.

F2.3.3.2 East Range Site Wetland Impacts

Table F2-4 and the following subsections summarize the estimated total wetland impacts in the temporary and permanent ROWs for the East Range Site and the associated utility and transportation

corridors. Total permanent impacts to wetlands would consist of a range of 99.1 to 143.2 acres of wetland habitat lost. The final impact acreage would be dependent upon the selected utility and transportation corridor alternatives as well as the presence or absence of a rail line center loop and the configuration of the interior of the potential rail line center loop. Alternative utility and transportation corridors were developed in order to provide a greater range of possibilities in terms of deciding which corridors would cause the least amount of environmental damage.

East Range IGCC Power Station

The Mesaba IGCC Power Plant preliminary layout was planned to minimize wetland impacts. Wetland losses for the East Range IGCC Power Station Footprint are estimated at 15.6 acres, of which Phase 1 wetland losses are estimated at 11.9 acres, and Phase 2 wetland losses are estimated at 3.7 acres. Type 7 wetlands are the most abundant within the project limits and would incur the most impacts for both phases of the Mesaba IGCC Power Plant. Phase 1 would have the majority of wetland impacts for the facility, most of which are Type 7 wetlands. Phase 2 would involve less wetland impact acreage overall, but would include impacts to a small Type 2 wetland not impacted by Phase 1.

East Range HVTL Alternative 1

For HVTL Alternative 1, an estimate of 0.05 acres of Types 2, 5, 6, 7, and 8 wetlands would be permanently lost for placement of new utility poles. To the extent practicable, wetlands would be avoided for installation of the HVTL, and construction activities would be planned during the winter months to further minimize direct impacts to wetlands. Permanent wetland impacts would be limited to those areas where HVTL utility poles would be placed within wetland habitat.

Tree and shrub clearing in wetlands would usually be initiated along new areas of ROW. Trees and shrubs would be cleared in Types 6, 7, and 8 wetlands. No vegetation clearing would be anticipated in Type 1-5 wetlands (i.e., herbaceous dominated vegetation in seasonal basins, wet meadow, shallow marsh, or open water wetlands). However, wetlands are not anticipated to be cleared of trees in shrubs for HVTL Alternative 1 because it is located entirely within existing ROW, and this existing ROW is already maintained free of trees and shrubs. In the future and beyond the scope of this project, maintenance of the ROW would likely include clearing of trees and shrubs that re-establish in wetlands, but this would also be completed during the winter months avoiding direct wetland impacts or to potential nesting birds.

There are 21 crossings of streams or water bodies associated with HVTL Alternative 1 that would require crossing 1,194 linear feet of water. Placement of the power poles supporting the HVTL would be designed to avoid direct impacts to streams, rivers, or other bodies of water within the project area. The average expanse between poles would be approximately 650 feet, but in sensitive or otherwise important areas that should be avoided, the expanse between power poles may be shortened to whatever length necessary or lengthened to approximately 1,000 feet. Therefore, wetland impacts within the bed of any water bodies would be avoided.

Table F2-4. Summary of Total Temporary and Permanent ROW Wetland Impacts for East Range Site and Associated Utility and Transportation Corridors

Project Alternative	Total Wetland Impacts (Acres)		
	Temporary ROW		Permanent ROW
	Temporary Impacts in ROW	Permanent Impacts in ROW	Permanent Impacts in ROW
IGCC Power Station	n/a [1]	n/a [1]	15.61
HVTL Alternative 1	n/a [1]	n/a [1]	0.05 [2]
HVTL Alternative 2	n/a [1]	n/a [1]	0.04 [2]
Natural Gas Pipeline Alternative 1	67.29	0	46.81
Process Water Supply Pipeline (Area 2WX to Footprint)	1.45	0	0.87
Process Water Supply Pipeline (Area 2WX to Area 2W)	0	0	0
Process Water Supply Pipeline (Area 2W to Area 2E)	0	0	0
Process Water Supply Pipeline (Area 3 to Area 2E)	0.41	0	0.23
Process Water Supply Pipeline (Knox Mine to Area 2WX)	0	0	0
Process Water Supply Pipeline (Area 6 and Stephens Mine to Area 2WX)	0.45	0	0.26
Process Water Supply Pipeline (Area 9 South to Area 6)	0.54	0	0.29
Process Water Supply Pipeline [Area 9 North (Donora Mine) to Area 6]	0	0	0
Railroad Alternative 1 and Center Loop	0 [3]	17.21 [3]	58.59 (includes 47.91 within center loop) [4]
Railroad Alternative 2 (no center loop)	0 [3]	18.35 [3]	13.37 (no center loop)
Potable Water and Sewer Pipelines	0	0	0
Roads	5.53	0	3.23
Estimated Range of Total Permanent Wetland Impacts [5]			**99.1 – 143.2**

[1] Temporary construction areas for the Mesaba Generating Station or temporary ROW for the HVTL corridors are not defined for the project area; therefore temporary wetland impacts are not anticipated for these project alternatives.
[2] Permanent impacts in the permanent ROW for HVTL is limited to placement of new power poles.
[3] Impacts in railroad temporary ROW are permanent impacts due to grading in the construction limits, which should be included with total permanent wetland impacts for mitigation purposes.
[4] The impacts for the rail loops could be reduced upon completion of final design specifications associated with the rail corridor.
[5] The range of impact values represents the differing total acreages that could result, which is dependent upon the project alternatives that are ultimately selected and the configuration of the interior of the selected rail line center loop (the low range assumes no center loop impacts and the high range assumes complete center loop impacts).

Source: Excelsior, 2006b

East Range HVTL Alternative 2

For HVTL Alternative 2, an estimate of 0.04 acres of Types 2, 5, 6, 7, and 8 wetlands would be permanently lost for placement of new utility poles. To the extent practicable, wetlands would be avoided for installation of the HVTL, and construction activities would be planned during the winter months to further minimize direct impacts to wetlands. Permanent wetland impacts would be limited to those areas where overhead utility poles would be placed within wetland habitat.

The majority of HVTL Alternative 2 is proposed within an existing 100-foot power utility ROW. Approximately 1.5 miles of the proposed corridor is new and would require tree and shrub clearing in wetlands. A total of 0.6 acres of trees and shrubs would be estimated to be cleared in Type 6 wetlands. No vegetation clearing would be anticipated in Type 1-5 wetlands (i.e., herbaceous dominated vegetation in seasonal basins, wet meadow, shallow marsh, or open water wetlands). Direct wetland impacts to these wetlands are not anticipated as no stump grubbing, excavation, or fill is planned for the areas to be cleared of woody vegetation. Ultimately some wetland areas may be converted to different types (e.g., Type 6 scrub-shrub habitat may convert to Type 2/3 wet meadow/shallow marsh); however, direct loss of wetland would not be anticipated. In addition, tree clearing activities would be completed during the winter months, thereby avoiding direct impacts to the wetlands from equipment and the bird nesting period which is in compliance with the Federal Migratory Bird Treaty Act. In the future and beyond the scope of this project, maintenance of the ROW would likely include clearing of trees and shrubs that re-establish in wetlands, but this would be completed during the winter months avoiding direct wetland impacts by equipment or to potential nesting birds.

There are 20 crossings of streams or water bodies associated with HVTL Alternative 2 that would require crossing 1,760 linear feet of water. Placement of the power poles supporting the HVTL would be designed to avoid direct impacts to streams, rivers, or other bodies of water within the project area. The average expanse between poles would be approximately 530 feet, but in sensitive or otherwise important areas that should be avoided, the expanse between power poles may be shortened to whatever length necessary or lengthened to approximately 1,000 feet. Because of this, wetland impacts within the bed of any water bodies would be avoided.

East Range Natural Gas Pipeline Alternative 1

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed Natural Gas Pipeline Alternative 1 corridor would include a total of 67.3 acres of Types 2, 5, 6, 7, 8, and riverine wetlands in the 100-foot temporary ROW. For the 70-foot permanent ROW, wetland losses would be 46.8 acres. These impacts are based upon the NWI maps, because the locations have not been field delineated.

For water crossings, the natural gas pipeline would be directionally drilled under water bodies starting at approximately 100 feet from the edge of each bank. This method would minimize impacts to wetlands associated with water crossings. The East Range Natural Gas Pipeline Alternative 1 would require crossing approximately 792 linear feet of streams and bodies of water, not including adjacent wetland habitat. Impacts to wetlands due to the stream crossings are based on a 100-foot temporary ROW and a 70-foot permanent ROW. Wetland habitats adjacent to the stream crossings that would be affected where the pipeline emerges on either side of the crossing include 21.1 acres in the temporary ROW. These impacts would be temporary in nature and wetlands would be restored upon completion of the installation. The pipeline would also cause 14.8 acres of wetland losses in the permanent ROW. The remainder of the natural gas pipeline would include open trench installation.

East Range Process Water Supply Pipeline – Area 2WX to Site

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed Process Water Supply Pipeline – Area 2WX to Site corridor would include a total of 1.5 acres of Types 3, 7, and 8 wetlands in the 150-foot temporary ROW. For the 100-foot permanent ROW, wetland losses would be 0.9 acres. These impacts are based upon the NWI maps because the locations were not field delineated. There are no stream crossings associated with the Process Water Supply Pipeline – Area 2WX to Site. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the process water line corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

East Range Process Water Supply Pipeline – Area 2WX to Area 2W

No wetland impacts have been identified for Water Process Line – Area 2WX to Area 2W, therefore no affects due to construction or operation activities are anticipated for this alignment.

East Range Process Water Supply Pipeline – Area 2W to Area 2E

No wetland impacts have been identified for Water Process Line – Area 2W to Area 2E, therefore no affects due to construction or operation activities are anticipated for this alignment.

East Range Process Water Supply Pipeline – Area 3 to Area 2E

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed Process Water Supply Pipeline – Area 3 to Area 2E corridor would include a total of 0.4 acres of Type 4 wetlands in the 150-foot temporary ROW. For the 100-foot permanent ROW, wetland losses would be 0.2 acres. These impacts are based upon the NWI maps because the locations were not yet field delineated. There are no stream crossings associated with the Process Water Supply Pipeline – Area 3 to Area 2E. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the water process line corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

East Range Process Water Supply Pipeline – Knox Mine to Area 2WX

No wetland impacts have been identified for Water Process Line – Knox Mine to Area 2WX, therefore no affects due to construction or operation activities are anticipated for this alignment.

East Range Process Water Supply Pipeline – Area 6 and Stephens Mine to Area 2WX

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed Process Water Supply Pipeline – Area 6 and Stephens Mine to Area 2WX corridor would include a total of 0.5 acres of Type 6 wetlands in the 150-foot temporary ROW. For the 100-foot permanent ROW, wetland losses would be 0.3 acres. These impacts are based upon the NWI maps because the locations were not yet field delineated.

There are two stream crossings associated with the Process Water Supply Pipeline – Area 6 and Stephens Mine to Area 2WX corridor. Wetland impacts would include the total length of the crossing through streams and adjacent wetlands. There are no wetlands mapped on the NWI adjacent to the crossing at Second Creek, therefore impacts to adjacent wetlands would be avoided for this crossing. The total length of stream crossings would be 33 linear feet over water, and a total of 270 linear feet in the adjacent wetlands. Impacts to wetlands adjacent to the stream crossings are based on a 150-foot temporary ROW and 100-foot permanent ROW. Wetland habitats adjacent to the stream crossings that would be affected include 0.9 acres in the temporary ROW and 0.6 acres lost in the permanent ROW. Temporary wetland impacts may include tree and shrub clearing for construction staging areas paralleling the water process line corridor. Where soils and vegetation may become disturbed in the construction areas, these areas would be restored by loosening the soils from compaction and reseeding with grasses and forbs native to the region.

East Range Process Water Supply Pipeline – Area 9 South to Area 6

Wetland impacts would be minimized to the maximum extent feasible by routing the process water lines along existing and proposed roadways, railroads, and utility ROWs. Wetland impacts within the proposed Process Water Supply Pipeline – Area 9 South to Area 6 corridor would include a total of 0.5 acres of Type 5 wetlands in the 150-foot temporary ROW. For the 100-foot permanent ROW, wetland losses would be 0.3 acres. These impacts are based upon the NWI maps because the locations were not yet field delineated.

There is one stream crossing associated with this alternative. There are no wetlands mapped on the NWI adjacent to this crossing, therefore impacts to adjacent wetlands would be avoided. The total length of stream crossings would be 3 linear feet over water.

East Range Process Water Supply Pipeline – Area 9 North (Donora Mine) to Area 6

No wetland impacts have been identified for Water Process Line – Area 9 North (Donora Mine) to Area 6 corridor, however, the UGSG topographic map for the area has identified one stream that flows from Donora Mine to Partridge River. Because of the mining activity in the area, it is not clear from aerial photographs whether or not this stream currently exists or what measures have been taken to divert its path. No field investigation has been conducted in this area to date. As such, this crossing is addressed below assuming the stream exists.

There are no wetlands mapped on the NWI adjacent to this crossing, therefore impacts to adjacent wetlands due to stream crossings would be avoided. The total length of stream crossings would be 3 linear feet over water.

East Range Potable Water and Sewer Pipelines

Wetland impacts would be avoided by routing the sewer and water lines along existing and proposed roadways and utility ROWs. Construction of the potable water and sewer pipelines would require crossing approximately 460 linear feet of Colby Lake. Construction of the pipelines would be performed through directional drilling or microtunneling underneath the lake; therefore, no permanent impacts to the lake would be expected. There are no wetlands adjacent to Colby Lake at the point of crossing; therefore, no wetland impacts would be anticipated.

East Range Railroad Alternative 1

Wetland impacts from rail alignments in the vicinity of the East Range Site are essentially unavoidable, because railway design standards require level grades and wide turning radii. The railroad alternatives are the only utility or transportation corridors that have established construction limits, which may be considered as temporary ROW. For the East Range Railroad Alternative 1, the construction limits (temporary ROW) vary in width from 75 to 490 feet. The permanent ROW for the railroad would be an established 100-foot ROW, which includes the ROW width needed for the center loop.

Permanent wetland impacts within the railroad alternatives would occur within the construction limits (temporary ROW) and the center loop. There would be no temporary wetland impacts anticipated for the railroad alternatives due the necessary grading required for the railroad bed, therefore, those impacts are considered permanent. Permanent wetland losses within the construction limits (temporary ROW) would include 17.2 acres. Approximately 58.6 acres of permanent wetland losses would occur in the permanent ROW; of this, an estimated 47.9 acres of wetlands would be within the center loop of the rail spur for Alternative 1A. Therefore, maximum wetland losses could be 75.8 acres to Types 2, 2/3/4/6/7/8, and 6 wetlands. The impacts estimated for the center loop may be reduced upon completion of final design when the layout within the center loop is determined.

Railroad Alternative 1 would require crossing approximately 6 linear feet of streams and bodies of water. Wetland impacts are based upon wetlands adjacent to streams being crossed within the established construction limits. Approximately 15 acres of wetland would be lost due to grading of the railroad bed for Railroad Alternative 1. This includes 8 acres that would be in the corridor's permanent ROW. Permanent impacts from construction in the streambed for the center loop would be minimized by use of culverts under the railroad bed.

East Range Railroad Alternative 2

For the East Range Railroad Alternative 2, the construction limits (temporary ROW) vary in width from 60 to 500 feet. The permanent ROW for the railroad would be an established 100-foot ROW. There is no center loop associated with East Range Railroad Alternative 2. Permanent wetland losses within the construction limits (temporary ROW) would include 18.4 acres. Permanent wetland losses within the permanent ROW (the railroad bed itself) would include 13.4 acres. Therefore, maximum wetland losses could be 31.7 acres of Types 2, 3/7/8, 6, 7, and 7/8 wetlands.

Railroad Alternative 2 would require crossing approximately 6 linear feet of streams and bodies of water. Wetland impacts are based upon wetlands adjacent to streams being crossed within the established construction limits. Approximately 6.3 acres of wetland would be lost due to grading of the railroad bed for Railroad Alternative 2. This includes 2.6 acres that would be in the corridor's permanent ROW.

East Range Roads

For the design of access roads, corridors were identified that would minimize overall impacts, considering grading requirements, existing topography, accessible properties, and presence of wetlands, while achieving the access needs for the East Range Site. Although there would be impacts to wetlands due to the placement of the corridors, these impacts would be balanced by the overall site grading requirements.

Roads that would serve the facility would impact a total of 5.5 acres of Types 6 and 7 wetlands in the 200-foot temporary ROW. For the 120-foot permanent ROW, wetland losses would be 3.2 acres. No water crossings are associated with the road alignments.

F2.3.3.3 Wetland Permitting

Implementation of the Mesaba Energy Project would require submittal of a Combined Wetland Permit Application and Replacement Plan, which would be prepared and submitted to the following agencies (Excelsior, 2006b):

- USACE – Section 404 Clean Water Act wetland dredge-and-fill activities permit.
- Minnesota Pollution Control Agency (MPCA) – Section 401 Clean Water Act water quality certification.
- Minnesota Department of Natural Resources (MNDNR) – Public Waters work permit.
- Itasca County Soil and Water Conservation District (SWCD) – Wetland Conservation Act (WCA) approval (West Range Site and Associated Corridors).
- St. Louis County, Minnesota – WCA approval (East Range Site and associated corridors not within the city limits of Hoyt Lakes, Minnesota).
- City of Hoyt Lakes, Minnesota – WCA approval (Associated corridors for East Range Site within the city limits of Hoyt Lakes, Minnesota).

Mitigation of wetland impacts would be in the form of direct replacement or by the purchase of credits through an approved wetland bank. Wetland mitigation would follow USACE and Board of Water and Soil Resources (BWSR) requirements and guidance and include addressing the provisions of the Replacement Plan requirements set forth in the WCA. No specific plans for wetland mitigation have been proposed by the project proponent at this time. Detailed mitigation plans would be created during the wetland permitting process following site selection under the guidance of respective regulatory entities. Documentation accompanying the Combined Wetland Permit Application would include any design details on wetland replacement sites, wetland banks, and/or sources of wetland credit for the project. Mitigation requirements would be determined during the wetland-permitting phase of the project (Excelsior, 2006b).

In accordance with USACE and BWSR wetland mitigation policy, wetland replacement options would be explored in the following sequence:

- Step 1: Project-specific wetland replacement options (on or adjacent to the project site) would be investigated first. If no project-specific wetland replacement opportunities exist or additional mitigation credit is required, Step 2 would be followed.
- Step 2: Potential wetland replacement opportunities within the sub-watershed, watershed, or county where the project is located would be investigated. If no opportunities are available or additional wetland mitigation credit is required, Step 3 would be followed.
- Step 3: Potential wetland replacement opportunities within the MNDNR-defined eco-region, neighboring watersheds or counties or within a geographic area that is as close as possible to the project would be investigated.

F2.3.3.4 Wetland Impact Minimization and Mitigation

The wetland acreages impacted by the project as summarized in Sections F2.3.3.1, F2.3.3.2 and in Section 4.7 represent the maximum potential impacts. DOE expects that the wetland permitting process described above will result in permit conditions enforced by USACE that would address the minimization and mitigation of impacts as described in this section. In addition, DOE could also include minimization and/or mitigation of impacts as a condition of the Record of Decision, if necessary to fulfill DOE's obligations under 10 CFR 1022.

Pursuant to 10 CFR 1022.13(a)(3) "DOE shall evaluate measures that mitigate the adverse effects of actions in a...wetland including but not limited to minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically sensitive areas." Some of the methods and procedures to be used in the design, permitting and construction of the project are described below. In some instances, specific alternatives are discussed as an example of how the minimization could be achieved. The same process would be applied to whichever alternative is ultimately selected.

Minimize Area of Filling

There are a variety of design options to be exercised and evaluated during the design and permitting of the project that would reduce the area of wetlands to be filled. Some of the options available to the project proponent include:

- When placing fill, instead of employing grass embankments on a 3:1 slope down to the adjacent wetlands, design options could include gabion walls or retaining walls to minimize the footprint of disturbance. The deeper the fill (and therefore the longer the side slope) the more important this is. This approach is effective for all areas of filling whether for the power plant, the access roads, or the new rail lines.
- If, because of grade issues, roads or especially railways need to be placed on high embankment areas with a corresponding wide footprint, consideration would be given to placing some of the rail line or roadway on elevated structures to minimize the wetlands impacted.
- In Section 4.7, both the permanent and temporary ROWs for the railroads and the entire permanent ROWs of the roads are assumed to be totally impacted, with all wetlands filled. During the design process, every attempt would be made to minimize the footprint of the actual permanent fill, thus reducing, potentially by a large amount, the actual wetlands to be filled.

As an example, Rail Line Alternative 1A at the West Range Site would require 103.6 acres of vegetation to be cleared within the permanent ROW, including 77.1 acres of wetlands, 64.9 of which are within the center loop. An additional 108.5 acres of vegetation would be cleared within the broader construction limits including 26.5 acres of wetlands (see EIS Tables 4.7-7 and 4.8-14). However, if other locations for proposed activities within the center loop can be found, the filling of 64.9 acres of wetlands would be minimized or avoided.

Maximize Hydrologic Connections

In order to maintain many of the wetland functions such as flood control, sediment trapping and wildlife habitat, adequate drainage across and through the road and rail ROWs must be maintained. Some of the options available include:

- Frequent spacing of culverts under roadways and railroads.
- Installing several larger culverts that are frequently flowing or inundated with open bottoms that allow the natural substrate of the stream to remain.
- Grade for wide grass swales wherever practicable.

Limit the Number of Wetland Functions Impacted

During the design and construction process, efforts would be taken to minimize the temporary impacts to wetlands and to minimize the permanently filled wetlands. Some of the options available include:

- Limit the compression of temporarily disturbed wetland soils by minimizing heavy vehicular traffic across the compressible soils to the extent possible.

- In wetlands to be temporarily disturbed, stockpile the organic topsoil so that the existing substrate can be replaced after construction has been completed.
- Design roads and railroads to be as close to existing grade as possible, since the smaller the depth of fill, the smaller corresponding width of filling that would be required.

Provide Mitigation

The primary emphasis would be on restoration, enhancement and creation of wetlands within the project area and within the temporary and permanent ROWs of the roads, railroads and utility lines.

Continuing with the prior example of Rail Line Alternative 1A for the West Range Site:

- As an example of wetland restoration, efforts would be made during design and construction to restore grades and allow the 26.5 acres within the temporary disturbance area to be restored to the extent possible.
- As an example of wetland creation, grading plans during detailed design would incorporate measures to create new wetlands in areas adjacent to existing wetlands, such as in the 82 acres (108.5 minus 26.5 acres of wetlands) of upland vegetation cleared for grading outside the permanent ROW.

To the extent that insufficient on-site mitigation areas could be found, off-site mitigation banks and areas would be researched and evaluated in accordance with mitigation guidance provided by USACE.

Best Management Practices (BMPs)

The selection and inclusion of appropriate BMPs would be made during the permitting and design of the project. There are a multitude of BMPs related to stormwater and other indirect impacts to wetlands, which are discussed at numerous websites, including:

USEPA: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

The Minnesota Pollution Control Agency: http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html *and* http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html

University of Minnesota Water Resources Center:

http://wrc.umn.edu/outreach/stormwater/bmpassessment/

Minnesota DOT: http://www.dot.state.mn.us/tecsup/tmemo/active/tm05/06env04.pdf

Some additional information may be available for and included in the FEIS. More detailed discussions concerning USACE permitting may be found in EIS Section 4.7.7. Discussions pertaining to stormwater permitting may be found in EIS Section 4.5.2.5.