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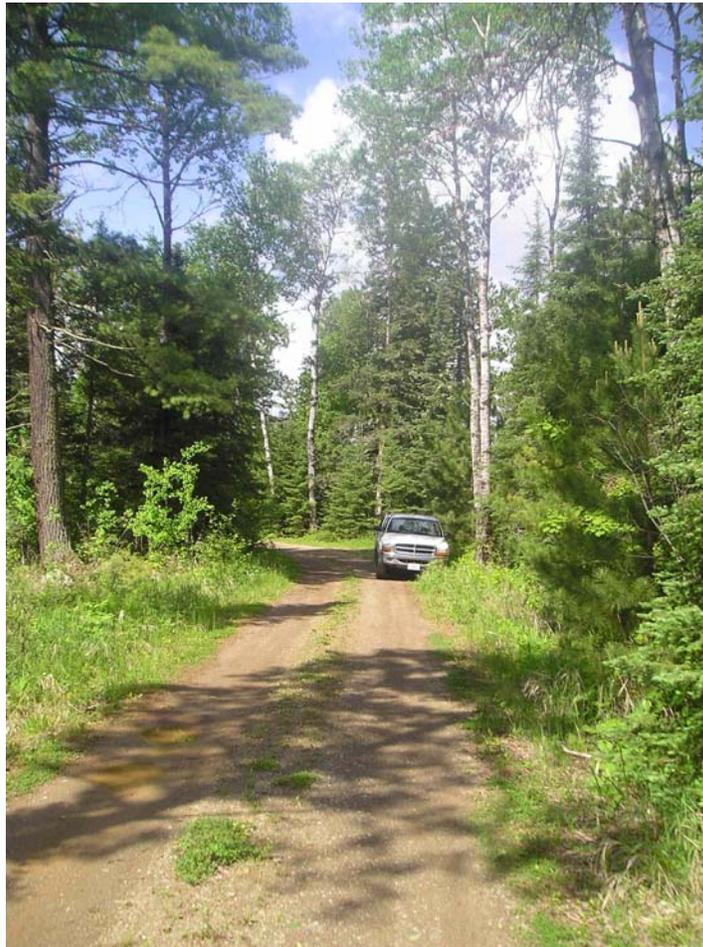
Eastern
Region

November
2007



Environmental Assessment for Kawishiwi Minerals Exploration

Superior National Forest



FR 186 Near South Kawishiwi River Recreation Residences

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Preface

The Forest Service has prepared this environmental assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This environmental assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into:

Chapter 1 - Introduction: The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2 - Comparison of Alternatives, including the Proposed Action: This section provides a more detailed description of the proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3 - Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area and significant issues. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

Chapter 4 - Agencies and Persons Consulted: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Kawishiwi Ranger District Office in Ely, Minnesota, and a duplicate is available at the Superior National Forest Supervisor's Office in Duluth, MN.

Chapter 1 – Purpose and Need

1.0 Introduction

The Eastern States-Milwaukee Field Office of Bureau of Land Management (BLM) has received three operating plans proposing exploration (not development) of federal hardrock minerals beneath the Superior National Forest on the Kawishiwi Ranger District. The drilling plans of operations are from three separate companies; Duluth Metals Corporation (Duluth Metals), Encampment Resources L.L.C. (Encampment) and Franconia Minerals Corporation (Franconia). Two of the companies, Duluth Metals and Encampment, hold federal mineral prospecting permits. Franconia has an earn-in agreement with Beaver Bay Joint Venture (BBJV) who holds a federal mineral lease.¹

Duluth Metals' proposed plan of operations is for their prospecting permits, MNES-050652 and MNES-050846, and Encampment's is for their prospecting permit, MNES-050817. Franconia's proposed plan of operations is for BBJV federal mineral lease ES-1352.

The federal laws and policies outlined in this document require the Forest Service, as the agency managing the surface, and the Bureau of Land Management, as the agency responsible for sub-surface resources, to consider the proposed plans of operations. Each agency will make decisions regarding the plan of operations for exploratory drilling on the Kawishiwi Ranger District as a result of this environmental assessment. First, the Kawishiwi District Ranger must determine what mitigation and reclamation conditions of approval for surface resource protection will be recommended to the BLM for the prospecting permit and lease operating plans. Second, based on the Forest Service's recommendation, the Bureau of Land Management will decide on authorizing the operating plans to explore federal minerals within the permit and lease areas.

1.0.1 Project Area

The areas of the permits and leases delineate the project area for this project. The proposed activities would occur about 10 miles southeast of Ely, MN, on State Highway 1 in an area southeast of the South Kawishiwi River (Figure 1.1 Project Area Locator Map and Figure 1.2, Map of Project Vicinity). The area is mostly managed by the Forest Service but the State of Minnesota also administers some areas in the vicinity of the permit and lease areas. There is a long history of both recreation and resource management in this area.

The area has had timber harvesting within the last 10 years and is mainly managed to meet Forest Plan objectives and desired conditions on the land. In the past 40 years, there have also been mineral exploration projects mainly involving drilling, mapping, rock sampling, soil sampling, and geophysical activities. Northeastern Minnesota has a long tradition of mineral development of iron ore.

¹ Lehmann Exploration Management Inc. was identified in the April 16, 2007, Forest Service scoping as the proponent for the lease plan of operations. Lehmann Exploration Management Inc. is the Operator and Attorney-in-Fact for BBJV. BBJV has entered into an earn-in agreement with Franconia Minerals Corporation (Franconia), whereby Franconia can earn a controlling interest in Beaver Bay's mineral interests in St. Louis and Lake Counties, Minnesota.

At various points in the figures "Lehmann" or "Lehmann Exploration Management Inc." is shown as the owner of federal lease ES 1352 or implied to be the operator of the proposed work. The leasehold interest is owned by Beaver Bay Joint Venture and the proposed work would be carried out by Franconia Minerals Corporation under its earn-in agreement with Beaver Bay Joint Venture.

Figure 1.1 Kawishiwi Minerals Exploration Locator Map

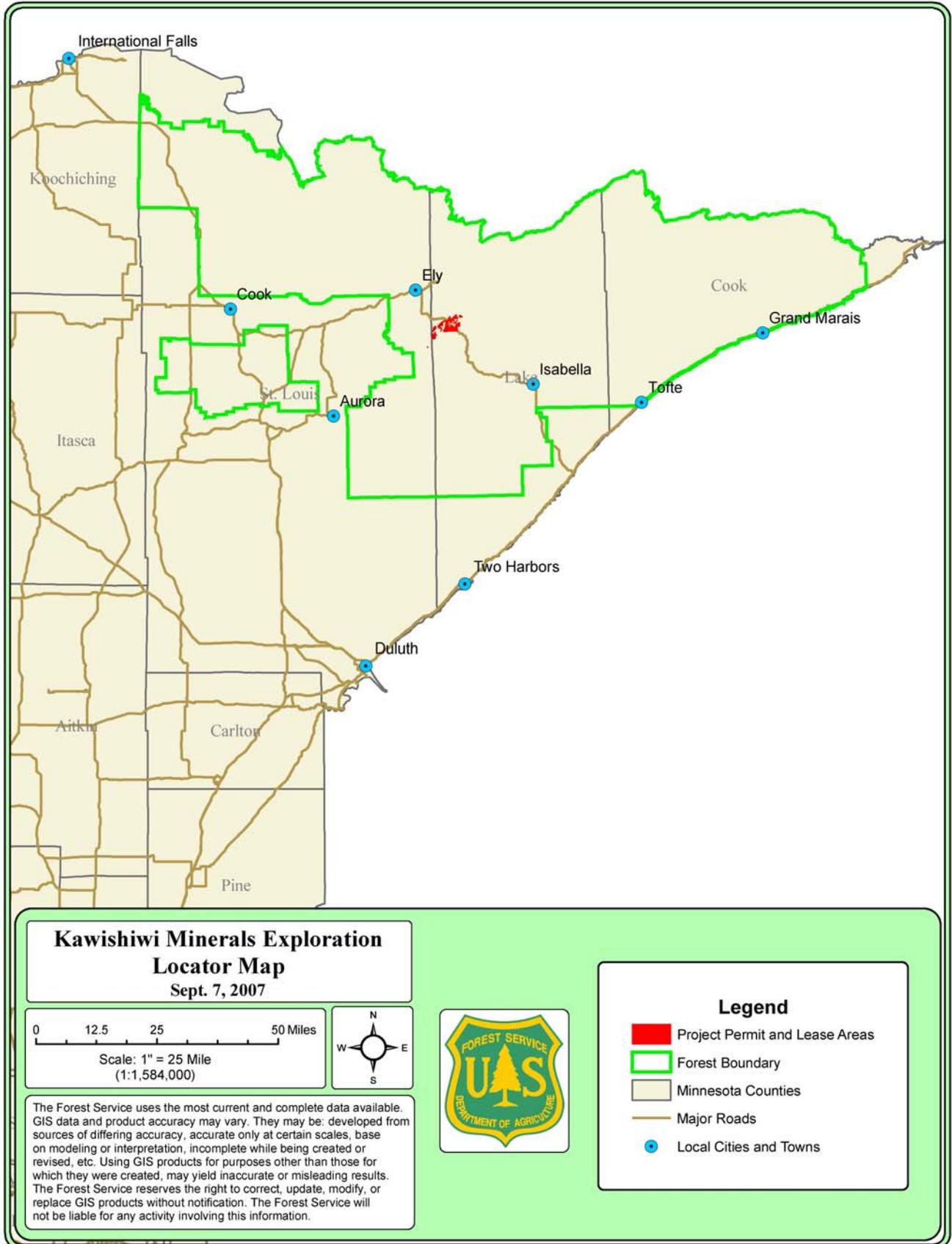
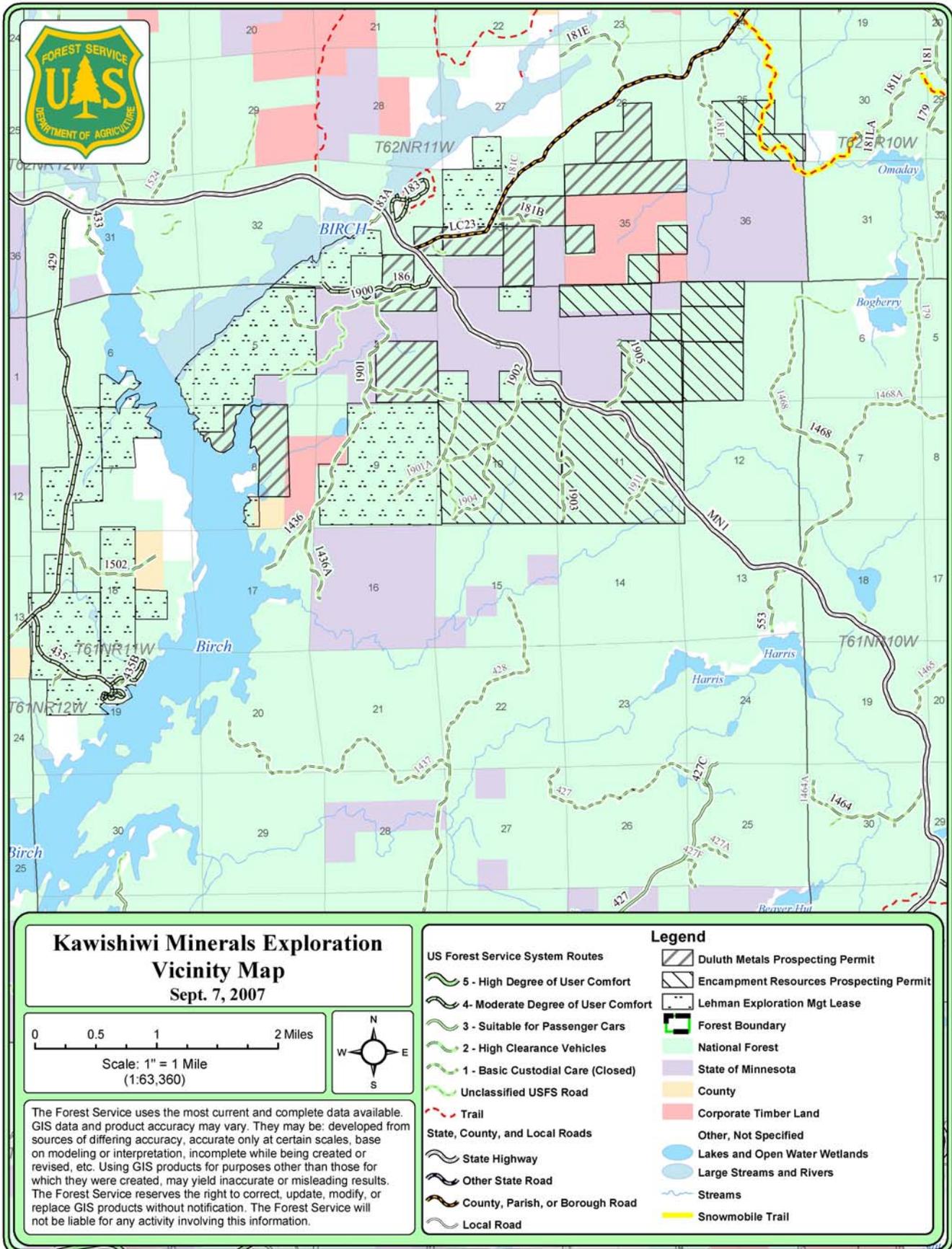


Figure 1.2: Kawishiwi Minerals Exploration Vicinity Map



The South Kawishiwi River is connected to several other lakes and rivers and this part of the river is one of many canoe routes in the area. Visitors enjoy fishing, canoeing, and other recreational activities. The South Kawishiwi River Campground is on the southeast bank of the river, just off the north side of Highway 1. The campground has 31 campsites, boat landing, swimming beach, picnic area, and nature trail. South Kawishiwi River Campground is a National Forest Campground operated by the Ely Area Campground Concessionaires.

Across Highway 1 from the campground there is an inactive Forest Service experiment station. The station is administered by the Forest Service Northern Research Station. Also on the south shore of the river on Forest Road 186, there are 30 recreation residences. These cabins are privately owned but on land administered by the Forest Service, so cabin owners have special use permits to occupy federal land. Further south on the river, there are two dispersed campsites on the east side of the river.

A designated snowmobile trail skirts outside the north and eastern edges of the proposed exploration. The snowmobile trail is a grant-in-aid trail that takes riders from Ely to Babbitt or to the Isabella area. Many of the roads in the area are open to ATV traffic, however there are no designated ATV trails in or immediately adjacent to the proposed drilling.

The Boundary Waters Canoe Area Wilderness lies to the north and east of the project area, approximately one and a half miles from project area. The Keeley Creek Research Natural Area is roughly 2 miles south of proposed drilling sites and the Harris Lake Natural National Landmark, a Unique Biologic Area (Forest Plan, pages 3-27 – 3-29), is roughly 2 ½ miles south of proposed drilling sites.

1.0.2 Key Terms

To help readers understand this analysis and decision process, Table 1.1 defines important terms used in this document.

Table 1.1: Key Terms

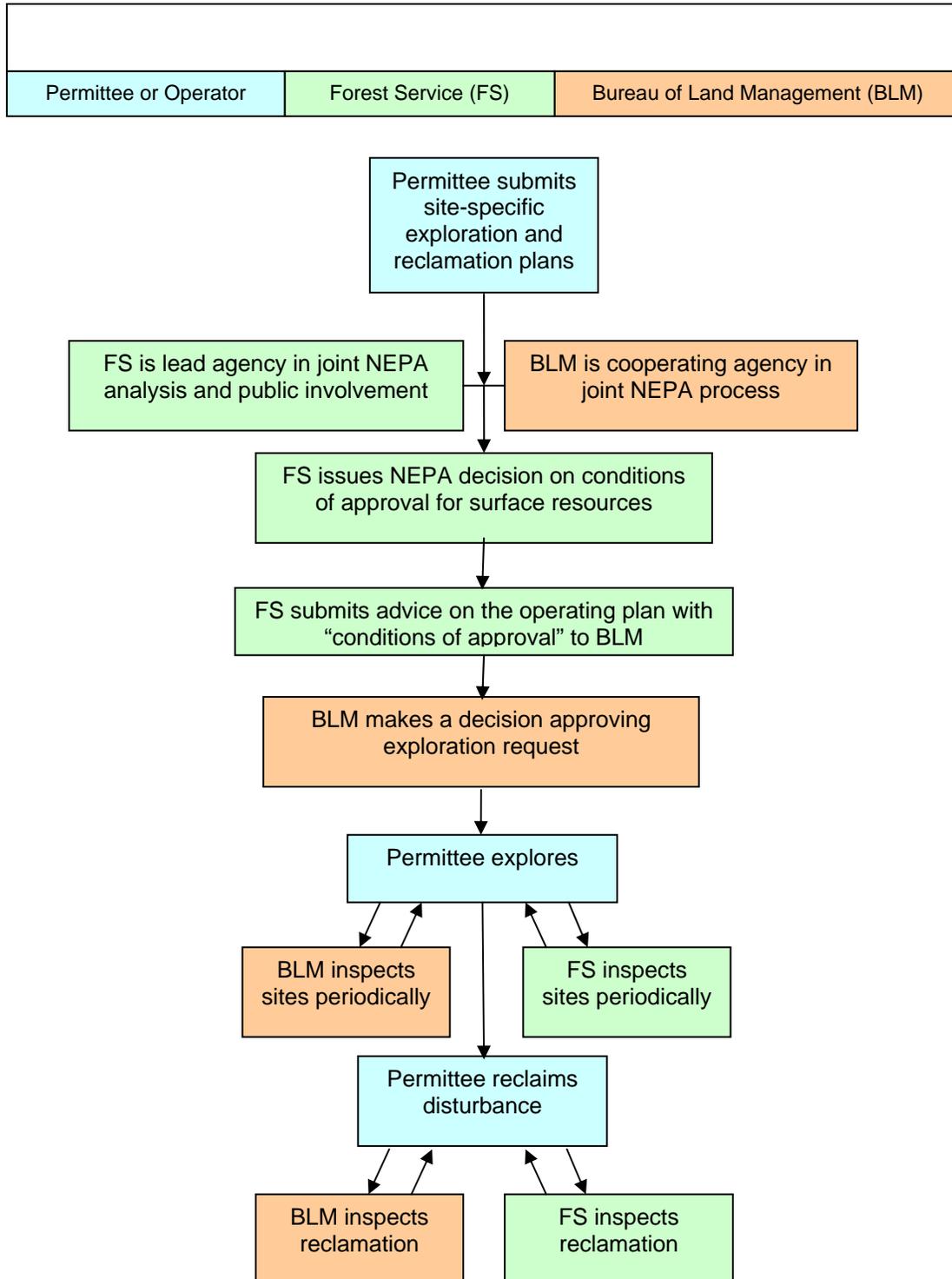
Term	Definition/Description
Abandonment	The process of permanently abandoning and rehabilitating a bore hole. Process must be completed according to State regulations that are designed to protect ground water.
Aquifer	A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to be able to yield significant quantities of water to wells and springs.
Cap	A fitting usually threaded onto the end of the core hole casing sticking out of the ground.
Cased	A hole that has casing installed.
Casing	Casing means a pipe or curbing placed in a well or boring to: A. prevent the walls from caving; B. seal off surface drainage; or C. prevent gas, water, or other fluids from entering the well or boring except through the screen, open hole, or perforated casing. [Minnesota Department of Health Rules (MDH) 4725.0100 Definitions, subpart 22]
Categorical exclusion	A category of actions that do not individually or cumulatively have a significant effect on the human environment. Neither an environmental assessment nor an environmental impact statement is required.
Cuttings	Ground up subsurface rock and a byproduct of drilling.

Term	Definition/Description
Decision notice	A concise written record of the responsible official's decision based on an environmental assessment and finding of no significant impact (FONSI).
Drill water/fluid	Water used for drilling to lubricate and flush the drill hole, typically brought to the drilling site from another source.
Environmental Assessment	A document prepared to determine if a proposed action, or its alternatives, may have significant environmental effects. If significant effects may occur, an EIS is prepared. If not, a FONSI and Decision Notice are issued.
Environmental Impact Statement	A document prepared for proposed actions that may have significant effects on the human environment. An EIS discloses significant issues and effects from the action and alternatives, for public review.
Federal minerals	Mineral rights owned by the United States government.
Federal mineral lease (hardrock)	BLM authorization that grants the leasee exclusive rights to explore for, develop, and produce valuable metals within the constraints of laws, regulations, and policies at the time the lease/claim was established or authorized. The BLM must obtain the consent of the surface management agency before they issue a lease or prospecting permit.
FONSI	Acronym for Finding of No Significant Impact. It is prepared and issued to the public when the results of an EA identify no significant impacts.
Forest Plan	A forest plan (land and resource management plan) guides all natural resource management activity and establishes management standards and guidelines for a National Forest, embodying the provisions of the National Forest Management Act of 1976.
Grout	A material used to fill the annular space around a casing, or to seal a well or boring. Grout is either neat cement grout, concrete grout, bentonite grout, or high solids bentonite grout. (MDH Rules 4725.0100, subpart 30)
Hardrock minerals	The term, hardrock minerals, includes mineral deposits that are found in sedimentary and other rocks. Hardrock minerals include base metals, precious metals, industrial minerals, and precious or semi-precious gemstones. Hardrock minerals do not include coal, oil shale, phosphate, sodium, potassium, or gilsonite deposits. Also, hardrock minerals do not include commodities the government sells such as common varieties of sand, gravel, stone, pumice or cinder.
Hydrogeology	The science that deals with subsurface waters and related geologic aspects of surface waters (Gary, 1974)
HUC6	Represents the boundaries of the United States Geological Survey's 6-digit hydrologic (watershed) unit.
Interim Reclamation	Interim reclamation is site stabilization after drilling operations have ceased yet before the hole is permanently plugged and abandoned.
Mineralization	The process or processes by which a mineral or minerals are introduced into a rock and can result in an economically valuable or potentially valuable deposit. This is a general term, incorporating various types and modes of mineralization.
NEPA	Acronym for the National Environmental Policy Act of 1969. This is the procedural guide for the decision-making and public disclosure process for site-specific project proposals and decisions.
Overburden	The loose soil, silt, sand, gravel, or other unconsolidated material overlying bedrock, either transported or formed in place (Gary, 1974)
Permanent sealing	The process of preparing an exploratory boring to be filled with grout and filling the exploratory boring with grout.

Term	Definition/Description
Potable water	Water which is safe for human consumption in that it is free from impurities in amounts sufficient to cause disease or harmful physiological effects. (MDH Rules 4725.0100 Definitions, subpart 35)
Preference right lease	A permittee, upon making a discovery of a valuable deposit of phosphate, sodium, or potassium (or hard-rock minerals on acquired lands) generally may apply for a preference right lease. A lease may be issued if (1) the deposit was discovered under terms of a permit issued for that specific mineral, (2) the land is shown to be chiefly valuable for that mineral (not applicable to phosphate), (3) the land is available for noncompetitive leases, and (4) the permittee follows special conditions that may apply and makes appropriate application within the time allowed. (Forest Service Manual 2820) This also applies to public domain lands in Minnesota.
Plan of Operations	An exploration plan submitted to the BLM and Forest Service that shows how the company intends to determine the existence and workability of a valuable deposit. The plan includes who the operator will be, a brief description of the affected environment, a narrative describing the method of exploration, equipment, measures to prevent or control fire, soil erosion, pollution of surface and ground water and air, damage to fish and wildlife or their habitat, damage to other natural resources, public health and safety hazards, actions necessary to meet all applicable laws and regulations, method for plugging drill holes, measures to reclaim the land, estimated timetable for each phase of the work, maps showing the proposed location of drill holes, roads, trenches and other disturbances, and any other data the BLM may require.
Primary terms	Initial duration of permit or lease.
Project	An action proposed by the Forest Service subject to public notice comment provisions under NEPA. It can also refer to a project proposed by a permittee/leasee.
Prospecting	To search for or explore (a region) for mineral deposits or oil.
Prospecting permits	A permit issued by the Bureau of Land Management, Department of Interior, who has jurisdiction over federally owned mineral rights, which grants the permittee the exclusive right to prospect on and explore the lands involved to determine the existence of, workability of, and/or commercial value of the mineral deposits therein. (From Forest Service Manual 2820)
Reclamation (plan)	Plan listing and describing steps taken to reclaim and stabilize drill sites once drilling activities have ceased.
Resistivity	Geophysical survey technique where electrical current is introduced into the ground and the potential difference is measured.
Return water	Water returned to surface from the bore hole. Used to lubricate drill bit and transport cuttings to the surface and into the sump.
Scoping	A process required by NEPA to solicit important issues and information related to a proposed action from within the agency, from other agencies, and from the public. Scoping aids in the development of alternatives for a proposed action.
Stipulations	A modification of the terms and conditions on a standard lease or permit form at the time of the permitting or lease. It often is associated with special measures to protect/mitigate resources.
Surface inspection	Inspection by Forest Service personnel in order to ensure plan of operations and/or reclamation plan has been followed.
Temporary sealing	Protecting an exploratory boring by following the construction and operation practices under Minnesota Rule 4727.0950 to 4727.0985 until the boring is permanently sealed.

1.1 Process and Agency Roles

Figure 1.3: Approving a Request for Exploration on a Prospecting Permit



When an exploration mineral operations plan is submitted to the BLM, they will review the plan prior to forwarding it to the FS to ensure compliance with applicable regulations. The BLM will forward the plan proposal to the FS with a request for recommendations for appropriate

conditions of approval for protection of surface resources, integration with other authorized uses of the surfaces, and required reclamation. The FS will forward to the BLM proposals for authorizations (special use permits) to use and occupy the NFS for associated activities (e.g., roads, transmission lines, pipelines, and other ancillary facilities) outside the prospecting permit/lease areas with a request for recommendations for appropriate conditions of approval.

Onsite inspections of the plan proposals will be conducted by the BLM and/or the FS as required. Onsite inspections of plan proposals were done in June 2007 by the FS and company representatives. During the inspections of the proposed sites, the FS negotiated with operators to ensure specific sites were consistent with the terms of the leases and permits. In all cases, the BLM is responsible for the mineral operations plan and has the administrative lead in the permit process. The FS has the administrative lead in the authorization of all other associated uses (e.g. special uses, road use permits) outside of the BLM authority.

The Forest Service reviews and advises the BLM on the adequacy of the permittee's operating plan in protecting and reclaiming the surface resources, including roads, as required by the terms and conditions of the lease or permit and in accordance with Forest Land and Resource Management Plan direction. In accordance with the interagency agreement between the BLM and the FS for leasable mineral operations on the National Forest System (1987), the Forest Service will lead the preparation of an environmental assessment, if required, with the BLM as a cooperating agency.

The Forest Service is the lead agency for this analysis and the United States Department of the Interior, BLM is a cooperating agency. The three operating plans propose similar drilling and exploration activities, and the proposed explorations are near each other (see Figure 2.1 in Chapter 2). Because these operating plans are located on federal lands managed by the Superior National Forest, the BLM must have advice on the conditions of approval from the Forest Service authorizing officer, Kawishiwi District Ranger, advising the BLM to approve these drilling plans of operations. Advised conditions of approval may include additional plan of operation stipulations designed for the protection of surface resources. Figure 1.3 outlines the process used to evaluate and administer mineral exploration on existing prospecting permits.

The process for evaluating and administering mineral exploration on existing leases is very similar to the process shown in Figure 1.3 for prospecting permits.

1.2 Background on Permits and Leases

1.2.1 Prospecting Permits

Duluth Metals, Ltd. - MNES-050652 and MNES-050846

Permits were issued by BLM effective December 1, 2001 and expiring November 30, 2003 with the consent of the Forest Service. The permits were extended by BLM with Forest Service consent effective December 1, 2003 and expire November 30, 2007. The BLM granted a prospecting permit suspension on July 19, 2007, effective retroactively to November 30, 2006. The suspension will remain in effect until the BLM resumes its permission to conduct prospecting operations.

Duluth Metals submitted an operating plan to the Forest Service in September 2006. A Categorical Exclusion for the proposal was signed on November 30, 2006. In January 2007, the Forest Service withdrew its decision on the operating plan until further environmental assessment was completed.

Encampment Resources Inc. - MNES-050817

Permit was issued by the BLM effective December 1, 2001 and expiring November 30, 2003 with the consent of the Forest Service. The permit was extended by BLM with Forest Service consent effective November 1, 2003 and expiring October 31, 2007. The BLM granted a prospecting

permit suspension on September 25, 2007, effective retroactively to November 30, 2006. The suspension will remain in effect until the BLM resumes its permission to conduct prospecting operations.

Encampment Resources submitted an operating plan to the Forest Service in June 2006. A Categorical Exclusion for the proposal was signed on November 30, 2006. In January 2007, the Forest Service withdrew its decision on the operating plan until further environmental assessment was completed.

1.2.2 Federal Mineral Leases

Franconia Mineral Corporation – Lease ES-1352

The BLM preference right lease was initially issued to the International Nickel Company, Inc. in 1966. In 1988, the lease was assigned/transferred to American Copper and Nickel Company. In 2004, the lease was transferred to Beaver Bay Joint Venture (BBJV), the current lease holder. Franconia Minerals Corporation has an earn-in agreement with BBJV and is the operator for this exploration project.

The primary term for the lease is 20 years. At the end of the primary term, the lessee has the right to apply for and receive three 10-year renewals as long as operations are in compliance with the terms and conditions of the lease. The lease was renewed for 10 years on July 1, 1989. All lease stipulations were analyzed through the NEPA process prior to renewal in 1989. The Forest Service documentation for approving the renewal is contained in a Decision Notice dated February 6, 1987 and signed by Clay G. Beal, Forest Supervisor. The lease was renewed for another 10 years effective January. Any and all operations relating to the lease were subject to the 1986 Forest Plan and its amendments.

1.2.3 Exploration and Reclamation Operations

Following is a brief description of activities typically associated with hardrock mineral prospecting.

1.2.3.1 Geophysical Surveys

Geophysical prospecting enables a geophysicist to look for magnetic or conductive rocks (anomalies) several hundred feet below the earth's surface without drilling exploratory holes. The magnetic or conductive rocks may represent mineralization. The geophysical survey techniques proposed within these areas are magnetic, electro-magnetic, electro-conductivity/resistivity, and gravity. These surveys are done in a grid type fashion where there is usually one base line that is one-half to one mile in length and several grid or wing lines that run perpendicular to the base line with varying lengths (usually equal to or less than one mile) set 200 to 1000 feet apart. A geophysicist and sometimes one or two assistants walk on and/or around these lines carrying hand held instruments laying and pulling small cables while taking readings every 50 to 1320 feet. Since the surveyors have to traverse these grid lines they may need to cut vegetation that is too dense to allow them and their equipment to get through. Normally the vegetation is thick shrubs and young trees. The grid line usually does not exceed three feet in width. Flags are attached to stakes, tree or shrubs to mark these lines. Access to the site may require clearing of overgrown roads and trails and sometimes new temporary road construction.

1.2.3.2 Core Drilling

The following is a description what typically is required for mineral exploration drilling.

- **Access to the drill site:** A road approximately 12-15 feet in width is needed to transport the drill rig to the site and to provide access for a water truck and personnel associated with the

drilling operation. Existing roads are used wherever possible. Roads are normally constructed to the lowest standard needed for access to protect resources. If access is needed through low or saturated areas, operations occur only during the winter months, at a time when the ground has sufficiently frozen to support vehicles. Other activities that occur for providing access in developing a temporary road include installing culverts and clearing vegetation, and removing trees. In addition to overland access on temporary roads, helicopters can be utilized to deliver equipment and supplies to the drilling sites.

- **Drilling pad:** A drilling pad is an area where the drill rig is set up. It can vary in size from 50 feet x 50 feet for a skid mounted drill to 100 feet x 100 feet for a truck mounted drill. This area would be cleared of all vegetation that would obstruct the setting up of the drill rig. The entire depth of a core hole would be drilled from this location.
- **Sump pit:** A sump pit is used to store and re-circulate water and bentonite for drilling and to collect and store drill cuttings (ground up subsurface rock and a byproduct of drilling). It is usually 30 to 60 feet long by 20 feet wide by 5 to 15 feet deep and is dug by a backhoe. In cases where ground water or bedrock is too close to the surface to dig a pit, a tank is used as a reservoir and settling point for core cuttings as water circulates through the drill hole during drilling.
- Water is used as a lubricant in the drilling operation. A river, lake or stream close to the drill site would be a likely water source. The water would either be pumped directly to the drill site (if the water source is within 1000 feet) using small hoses or pumped into a water truck and delivered to the drill site. Approximately 1000 to 2000 gallons of water are used per day for each hole depending on subsurface conditions. (The state of Minnesota requires permits for water use equal to or greater than 10,000 gallons per day.) To prevent water from escaping the drill hole and contaminating ground water, bentonite and rod casings are used. Bentonite is inert clay formed from the decomposition of volcanic ash. It is used in hardrock drilling operations because it absorbs water and expands, sealing off the drill hole and retarding lateral movement of water down hole. State requirements for down hole additives are covered under Minnesota Department of Health Rules Chapter 4725.2950, Drilling Fluids.



Figure 1.4: Truck Mounted Drill Rig

- **Drilling equipment and operation:** A standard truck-mounted drill rig, similar to a semi-truck and trailer, or skid mounted diamond core drill rig may be used. The skid mounted drill rig is approximately 20 feet long, 35 feet high (including boom), and 12 feet wide, and is pulled by a D-8 or comparable dozer. The drill rig would operate 24 hours a day in two 12 hour shifts.

More than one hole may be drilled at each site with different inclinations and directions depending on the geology. Support equipment may include a skid-mounted rod dray, a D-8 or comparable dozer, an excavator, a high lift and two or three axle trucks for transporting water, pipe, fuel and other equipments and drill core. Four wheel drive pickups and sport utility pickups (SUVs) are used to transport personnel and to service drill rigs. Vehicles and drills are equipped with the required fire-fighting equipment.

Drill hole depths are typically 500 to 1500 feet deep, but they can go as deep as 5,000 feet. Drill holes take about two to three weeks to complete. Cuttings settled out of the drill water in a sump pit or tank are subsequently buried in the sump pit or disposed off site in pre-approved areas for tank operations. Drill hole casings are temporarily capped with a threaded steel cap until permanent abandonment. Drill holes are permanently abandoned by cutting off drill hole casings at or below ground level and the bore hole is permanently sealed with cement grouting. Under Minnesota statute, Chapter 103I Wells, Borings and Underground uses, 103I.301 provides direction for sealing requirements for drill holes.



Figure 1.5 Skid Mounted Drill Rig

1.2.3.3 Reclamation

Final reclamation will occur after drilling activities and downhole geophysical surveys are completed and the company permanently seals the exploratory drill hole borings. The companies propose to leave some exploratory drill hole borings temporarily sealed (in accordance with State regulations and rules) for future work. In this situation, interim reclamation will occur after drilling operations have ceased and before the borings are permanently sealed. During interim reclamation, companies will be allowed to access sites for geophysical surveys and permanent sealing of the drill hole borings and reclamation. A reclamation bond estimation will be completed by the Forest Service for each plan of operation. The companies will be required to secure a reclamation bond with the BLM before the plan of operations are approved.

1.3 Superior National Forest 2004 Land and Resource Management Plan (Forest Plan)

The Land and Resource Management Plan (Forest Plan) provides guidance for a variety of resources that Forest Service managers use when developing management plans.

- Exploration and development of mineral resource is allowed on National Forest System land, except for federally owned minerals in designated wilderness (BWCAW) and Mining Protection Area (MPA) (D-MN-1, p.2-9).
- Ensure that exploring, developing, and producing mineral resources are conducted in an environmentally sound manner so that they may contribute to economic growth and national defense (D-MN-2, p.2-9).

Figure 1.6 displays the Management Areas within and in vicinity of the project area.

The project area is mostly in the General Forest management area.

- The General Forest management area emphasizes land and resource conditions that provide a wide variety of goods, uses, and services. These include wood products, other

commercial products, scenic quality, developed and dispersed recreation opportunities, and habitat for a diversity of terrestrial and aquatic wildlife and fish. Numerous roads open to public travel provide access to resources and roaded recreation opportunities. Non-motorized recreation opportunities also occur.

Areas adjacent to the South Kawishiwi River are in the Recreation Use in a Scenic Landscape management area.

- This management area emphasizes land and resource conditions that provide a scenic landscape for recreational activities in natural-appearing surroundings. These areas also provide wildlife habitat to enhance recreational wildlife watching opportunities. Concentrated recreation use is common. Facilities and access may be highly developed, resulting in a high degree of user interaction. Low-density recreation is also offered in areas with remote character. (FP p. 3-14).

The general desired condition for scenic environments across the Superior National Forest ranges from landscapes with high scenic quality, displaying little or no evidence of management activities, to landscapes with low scenic quality where evidence of management activities dominate. High scenic quality is protected or enhanced in landscapes with outstanding scenic value and in high public use recreation areas and corridors. (FP p.2-45, D-SC-1)

Areas along the South Kawishiwi River, recreation sites, and Highway 1 have high Scenic Integrity Objectives (SIO) (FP p. 2-48). See Figure 1.6. High SIO areas extend at least one-quarter mile from the actual location of travel ways, recreation sites, and bodies of water with access. In high SIO areas, vegetation management (including creating openings such as for clearing vegetation for drilling sites) that is visible from travel ways, recreation sites, and lakes with access:

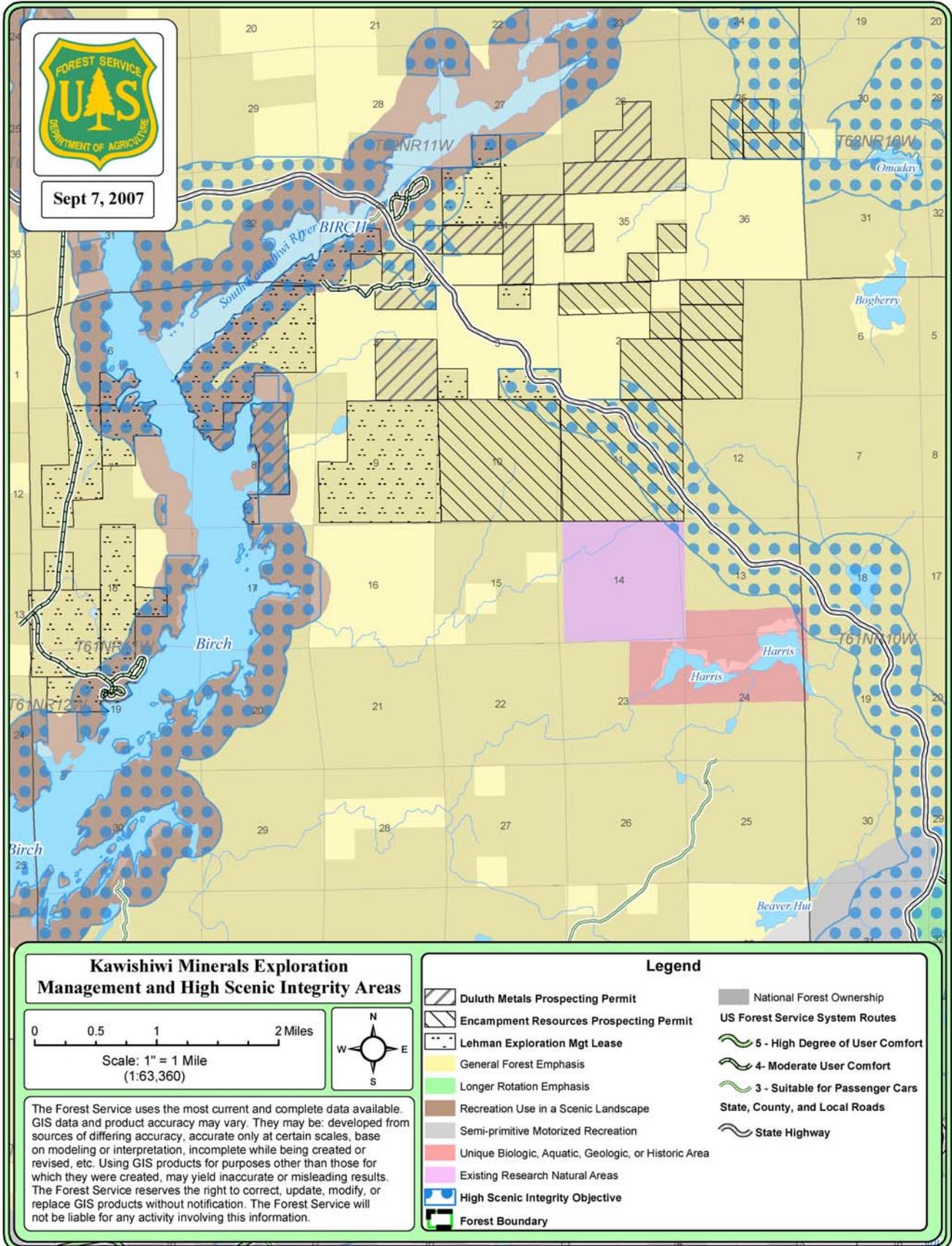
- Enhances views, creates vistas, and features natural openings,
- Retains canopies over travel routes,
- Encourages vegetative diversity and seasonal color contrast, and
- Enhances big-tree appearance. (FP p.2-45, D-SC-2)

One objective in the Forest Plan is to administer a recreation special use program providing for recreation uses associated with the existing resorts, residences, camps and other recreation special uses. “Recreation special uses will continue where their use enhances the recreation potential of the area, meets an apparent public need, and is compatible with other multiple-use goals and objectives.” (Forest Plan, p. 2-53, O-SU-3)

1.4 Purpose and Need for Action

The purpose and need of the project is for Duluth Metals, Encampment, and Franconia to conduct mineral exploration drilling and geophysical activities that will allow them to collect geologic information and drill core samples that may be used to analyze, map and discover the presence and extent of minerals. As the lead agency, the Forest Service needs to complete environmental analysis to ensure that exploration of mineral resources is conducted in an environmentally sound manner (Forest Plan D-MN-2, page 2-9), consistent with the terms of the permits and lease, and consistent with the goals and objectives and standards defined in the Forest Plan. This project needs to address the minerals exploration on specific sites proposed by Duluth Metals, Encampment Resources, and Franconia. In addition, the project needs to be consistent with Forest Plan Desired Conditions D-MN-1 and D-MN-2 (as described above) to ensure that the protection of federal surface would be accomplished.

Figure 1.6: Kawishiwi Minerals Exploration Project Management Area and High Scenic Integrity Objective Area Map



As the permitting and leasing agency, the BLM needs the following to be addressed in the environmental analysis:

- Down hole information regarding the size of their holes and casing specifics.
- Methods of proposed drilling including planned use of specific drilling additives.
- Methods for abandoning drill holes and drilling site restoration plans.

1.5 Proposed Action

The proposed operating plans considered in this environmental assessment are in Appendix A. Duluth Metals, Encampment Resources, and Franconia Exploration propose exploratory drilling on a total of 74 sites; 10 for Duluth Metals, 41 for Encampment Resources, and 23 for Franconia Exploration. The surface area disturbed by the combined 74 drill sites would total about 9 acres. Figure 2.1 displays the sites of the proposed drilling. Many of the proposed drill holes are sited in saturated soils or are otherwise accessible overland only when the ground is frozen. Where drilling is proposed in saturated soils, overland access to these sites would be during winter when the area is thoroughly frozen and access can be established with minimal disturbance.

Forest roads 181, 181B and F, 186, 1900 and 1905 would be used to transport drill rigs, personnel and supplies to the drill sites. A combined total of approximately 7.2 miles of temporary road would be constructed to access the drill sites. Temporary roads are roads authorized by contract, permit, lease, other written authorization, or emergency operation that are not intended to be a part of the forest transportation system, and not necessary for long-term resource management. These roads are not included on the National Forest System road inventory and are decommissioned after use (Forest Plan, Glossary-22 and Glossary-27).

Some clearing of overgrowth on existing roads may be required for passage of the drill rigs. All the proposed temporary roads would be closed from use after drilling operations and permanently decommissioned after the holes are plugged. All proposed temporary roads would be closed to public use during and after drilling operations. The closures and decommissioning would be monitored for effectiveness. Access to drill sites would also include the possibility of utilizing helicopters to lengthen the potential operations period beyond frozen conditions, where required for access considerations.

1.6 Decision Framework

1.6.1 Authorities

The FS manages the NFS for multiple use and sustained yield of products and services and is authorized to govern their use and occupancy under the authority of the Organic Administration Act of 1897, the Multiple-Use Sustained Yield Act of 1960, the National Forest Management Act of 1976, and the Federal Land Policy and Management Act of 1976.

The Federal Government's policy for minerals resource management is expressed in the Mining and Minerals Policy Act of 1970, "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs." The Forest Service's policy is to "administer its minerals program within the overall context of the principles of ecosystem management".

In Minnesota, on National Forest lands reserved from the public domain, deposits of hardrock minerals are subject to disposal under the Act of June 30, 1950. This act authorizes the Secretary of the Interior to permit the prospecting, development and utilization of federal hardrock minerals only with the consent of the Secretary of Agriculture.

Because the Act of June 30, 1950 authorizes leasing and development of conditions similar to those prescribed for like deposits covered by the President's Reorganization Plan of 1946, the Secretary of the Interior has prescribed the same regulations to the extent they are not inconsistent (43 CFR 3565). The regulations of the Secretary of the Interior for leasing mineral deposits in public lands and National Forest System lands are contained in title 43 of the Code of Federal Regulations, parts 3000 through 3568.6. The Bureau of Land Management (BLM) exercises the authority of the Secretary of Interior for exploration and leasing of federally owned minerals.

1.6.2 Decisions to Be Made

As explained above, Encampment Resources and Duluth Metals have federal mineral explorations permits, and Franconia has an earn-in agreement with BBJV on their federal mineral lease. The three parties have, consistent with the rights previously conveyed to them, submitted plans of operations to continue to explore the federal minerals beneath the Superior National Forest.

The FS is responsible for surface resource management and the BLM is responsible for subsurface resource management as it relates to the plan of operation proposals. The FS and BLM will identify and disclose, in the environmental assessment document, the potential impacts of the operation and other authorized uses on the environment, surface and subsurface resources, and develop appropriate measures to mitigate unacceptable impacts. Such measures shall be in conformance with applicable Federal statutes, regulations, lease and prospecting permits terms and stipulations, and the Forest Land and Resources Management Plan. These measures, including the reclamation requirements, which are identified in the environmental assessment to mitigate adverse impacts of the proposed mineral activity, may be included in the FS's recommendations to the BLM so they consider them in their approval(s) of the mineral plan of operations.

1.6.2.1 Prospecting Permit Operating Plans for Duluth Metals, Ltd. (MNES-050652 and MNES-050846) and Encampment Resources Inc. (MNES-050817)

The Kawishiwi District Ranger must determine what mitigation and reclamation conditions of approval for surface resource protection will be included in the Forest Service advice to the BLM for the prospecting permit operating plan concurrence (FSM 2822.04c and 2822.62). This decision will be based on Duluth Metals and Encampment's existing permit terms and conditions, Forest Plan goals and objectives, public comments and analysis disclosed in this environmental assessment.

Then, based on the Forest Service's advice, the Bureau of Land Management will decide how to authorize Duluth Metals and Encampment Resources plan of operations to explore federal minerals within the permit areas. The BLM must determine if Duluth Metals and Encampment Resources have adequately described, within their Exploration Plans, how they will prospect for the mineral commodities targeted on their permits. There is a list of requisites which an Exploration Plan must include prior to approval such as: anticipated drilling schedules, the location of proposed drill sites, the type of equipment to be used, description of the local geology, hydrology and other physical aspects of the environment which will be affected by the proposed action, to name a few. The BLM will determine what additional stipulations are needed in addition to Forest Service recommendations.

1.6.2.2 Lease Operating Plan for Franconia (ES-1352)

The Kawishiwi District Ranger decision is to determine what mitigation and reclamation conditions of approval for surface resource protection will be included in the Forest Service

advice to the BLM for the hardrock mineral lease operating plan concurrence (FSM 2822.04c and 2822.62).

Then, based on the Forest Service advice, the Bureau of Land Management will decide how to authorize Franconia's plan of operations to explore federal minerals within the permit area. The BLM must determine if Franconia has adequately described, within their exploration plan, how they will prospect for hardrock minerals. There is a list of requisites which an exploration plan must include prior to approval such as: anticipated drilling schedules, the location of proposed drill sites, the type of equipment to be used, description of the local geology, hydrology and other physical aspects of the environment which will be affected by the proposed action, to name a few. The BLM will determine what additional stipulations are needed.

1.6.2.3 Consideration of Future Mining in the Decisions to Be Made

Potential future mining is not an element of the decision to be made in this document and it is not included in this analysis. It is not a connected action and not reasonably foreseeable since it is dependent on the unknown outcomes of the proposed plans of operations for minerals exploration. There is not enough information to reliably indicate where and how mining would occur, what would be mined, or when it would take place. Therefore, effects to the human environment from mine development would not be meaningfully evaluated.

Prospecting Permits MNES-50652 & MNES-050846 (Duluth Metals) and MNES-50817 (Encampment)

Both BLM and FS have had appeal decision-makers make clear that there is no regulatory connection between prospecting conducted under the auspices of a BLM prospecting permit and future mining on those lands.

For BLM, the Interior Board of Land Appeals definitively addressed the issue in 1992 in IBLA 92-392 *et. al.* (124 IBLA 218). With respect to exploratory drilling the Board stated: "...no commitment to authorize development has occurred by virtue of the authorization of [exploratory] drilling. BLM may properly defer any assessment of the environmental consequences of mineral development until after discovery of a valuable mineral deposit and prior to issuance of a lease."

The Washington Office of the Forest Service addressed the issue on September 27, 1999 at the second level appeal of a FS consent for a prospecting permit for clay in Shawnee National Forest. The Associate Deputy Chief's decision letter to appellant Mark Donham stated: "With respect to the question of whether prospecting and mining are connected actions, I wish to point out that the prospecting permit involved would contain a stipulation reserving to the government the right to deny the permittee a preference right lease even if the permittee makes a discovery. [Similar wording is contained in prospecting permits MNES50652 and MNES50817]. Without a preference right lease, no mining can occur. Therefore, the government is not making an irretrievable commitment to allow mining at the time the prospecting permit is issued, and the Forest service is not required to comprehensively analyze the environmental effects of mining prior to consenting to issuance of the permit. This is not to say that the stipulation totally eliminates the need to consider mining prior to consenting to a prospecting permit, simply that mining does not have to be analyzed in detail. If it is clearly evident when an application for a prospecting permit is being reviewed that no method of mining would be acceptable, the Forest Service should not consent to the issuance of the permit. In this case, it appears that clay mining was generally considered in the Shawnee National Forest Land and Resource Management Plan, and found acceptable or at least worthy of site by site consideration. Based on this general consideration of mining and the use of the stipulation that nevertheless reserves the right to deny mining, the Regional Forester's decision consenting to issuance of the prospecting permit without comprehensively analyzing the reasonably foreseeable impacts of mining can be supported."

In this EA, therefore, BLM does not need to perform any mining analysis for the current exploration plans, and FS needs only to demonstrate that a general consideration of mine development was available in the applicable Forest Plan when its consent decisions for the two permits were rendered. The Forest Service satisfied the “general consideration” of mine development in the 2004 Forest Plan, providing desired conditions and standards and guidelines for minerals exploration and development of mineral and mineral material resources (Forest Plan, pages 2-9 to 2-10).

Mineral Lease ES-1352 (Franconia)

The hardrock mineral lease issued by the BLM gives the leasee the right to construct and maintain structures and other facilities necessary or convenient for the mining, preparation, and removal of minerals under lease. Before these activities may proceed, an Environmental Impact Statement must be performed on a site-specific mine plan and it has been determined that all pertinent regulatory statutes such as the Clean Air Act, Clean Water Act, and Endangered Species Act will be complied with. Exploration is on-going under the lease and the company has not proposed a mine plan to date. This EA will not analyze a mine since it is not reasonably foreseeable and would be speculative, there is not enough information to reliably indicate where and how mining would occur, what would be mined, or when it would take place. Therefore, effects to the human environment from mine development would not be meaningfully evaluated.

1.7 Public Involvement

The proposals were listed in the Superior National Forest Schedule of Proposed Actions in July 2007. The proposed action was provided to the public and other agencies for comment in April 2007. The public submitted responses to the proposed action into June 2007. The Superior National Forest received 55 letters, e-mails, and phone calls regarding the proposal from individuals, South Kawishiwi River Recreation Residence owners, resort owners, environmental organizations, tribal representatives, and government agencies. A list of the letters, e-mails, and phone calls is in Appendix D.

In addition, as part of the public involvement process, the Kawishiwi Ranger District notified the public of the proposed drilling operations under the permits for Duluth Metals and Encampment in September 2006. Using the comments from individuals and local property owners, organizations, government agencies, Boise Forte Band of the Ojibwe, the interdisciplinary team developed the issues to address.

1.8 Issues

1.8.1 Significant Issues

Significant issues were defined as those directly or indirectly caused by implementing the proposed action. The Forest Service identified 2 significant issues raised during scoping, including.

Table 1.2 Significant Issues Disposition

Issue Topic	Where Addressed in the EA
Road/Access - Location of temporary roads could impact the road conditions and traffic on FR 186 which provides access to the S. Kawishiwi Recreation Residences.	1.2.3, 1.8.1, 2.2, 2.3, 2.5 & 3.3
Noise – Rec. Res. - Noise resulting from Franconia's proposed core drilling plan of operations has potential to be disruptive to people at the residences	1.8.1, 2.2, 2.2.2.6, 2.4, 2.5 & 3.2
Winter Ops/Season of Ops. Drilling during only frozen conditions would correspond to when Recreation Residences are least likely to be in use.	1.2.3, 1.8.1, 2.2, 2.3, 2.4, 2.5 & 3.2
Drilling Noise Effects on Recreation Opportunities - drilling could potentially be heard by Forest visitors at the South Kawishiwi River Campground, BWCAW entry points (#32 and #33), and other summertime and wintertime recreations.	1.0.1, 1.8.1, 2.2.2.6, 3.2 & 3.3

- **Access** – The issue relates to temporary road locations and methods of access. Indicators for this issue are:
 - Location of temporary road access routes in the vicinity of South Kawishiwi Recreation Residences to get to their cabins on the South Kawishiwi River. People noted that the proposed access of drill sites off of FR 186 would result in damage to the road such as rutting and traffic blockages or delays from drilling operations.
 - Method of Access concerns were raised about noise from Encampments proposed helicopter operations to access drill sites could affect local property owners and South Kawishiwi River Campground visitors.

- **Drilling Noise and Season of Operations** –The issue relates concerns about impacts to people at the South Kawishiwi River Recreation Residences, South Kawishiwi River Campground, and BWCAW from drilling noise. Indicators for this issue are:
 - Numbers of drilling sites by season of operations. People noted that they would be much less likely to be impacted by drilling noise if it were to occur in frozen conditions since they were much less likely to be using their recreation residences, the campground, or the BWCAW entry points during the winter.
 - Change in decibels of sound that can be potentially heard at points of concern, South Kawishiwi River Recreation Residences, South Kawishiwi River Campground, and BWCAW entry points of concern identified in scoping, points South Kawishiwi River #32 and Little Gabbro Lake #33. Estimated changes in decibels would indicate potential changes in levels of noise that people would experience at their recreation residences, the campground, and the BWCAW entry points during drilling.

1.8.2 Non-Significant Issues

Non-significant issues were identified as those:

- 1) outside the scope of the proposed action;
- 2) already decided by law, regulation, Forest Plan, or other higher level decision;
- 3) irrelevant to the decision to be made; or

- 4) conjectural and not supported by scientific or factual evidence.

The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..."

Table 1.3 Non-Significant Issues Disposition

Issue Topic	Rationale for Non-significant Issue	Where Addressed in the EA
Time of Operations - core drilling operations occur continuously 24 hours a day for the duration of the drilling at any site.	Affects of noise from drilling operations is addressed as a significant issue. Drilling operations typically take place 24 hours a day to shorten the duration of drilling during operating seasons and generally accomplish effective and efficient operations.	1.2.3, 1.8.1, 1.8.2, 2.2, 2.3, 3.2, & Appendix A
Damage Deposit should be required so road repair work is ensured. There is also concern that tax dollars would be used to repair and/or build the access roads.	All existing Forest Service system roads used by companies to haul equipment require a road use permit. This permit requires roads to be maintained to Forest Service standards or repaired at companies' expense to Forest Service standards. Companies are also bonded by Bureau of Land Management. If the Forest Service determines that roads/drill sites are not rehabilitated appropriately, this money is used for that purpose.	1.8.2
Proposal is inconsistent with the recreational and quiet nature of the area.	The Recreation Opportunity Spectrum identified in the Forest Plan for this area is Roded Natural in the General Forest Management Area (Forest Plan page 3-45). Interactions between users may be moderate to high, with evidence of other users prevalent.	1.8.2 & 3.2
Effects on System Roads – concern that operational traffic could negatively effect native vegetation along the roads and ruin roads	Use on road systems would be within the use design of Forest Service system roads, county roads, and state roads.	1.8.2, 2.2, 2.3 & 3.3
Effects of Temporary Roads – concern that temporary roads built could: <ul style="list-style-type: none"> ▪ become permanent, ▪ fragment forest habitat, ▪ increase unauthorized motor vehicle use, which is hard to enforce, ▪ result in trampled brush, shrub and tree limbs as well as big piles of trees, boulders and debris here and there, wetlands with run-off. ▪ result in surface erosion on and along roads which makes them mud holes. 	Roads authorized by contract, permit, lease, other written authorization, or emergency operation that are not intended to be a part of the forest transportation system, and not necessary for long-term resource management. These roads are not included on the National Forest System road inventory and are decommissioned after use. Activities that occur for providing access in developing a temporary road include installing culverts and clearing vegetation, and removing trees. Cut brush and slash would be utilized to protect and rehabilitate temporary roadways	1.2.3.2, 1.5, 2.2.2.2, 2.2.2.7, & 2.3

Issue Topic	Rationale for Non-significant Issue	Where Addressed in the EA
Traffic – FRs and Hwy 1 – concern that heavy vehicle traffic on FRs and Highway 1 would inconvenience forest recreational visitors (consider reconstruction of Hwy 1)	The projected traffic associated with the Kawishiwi Exploratory Drilling Project would not change the level of service for the forest roads or Highway 1.	1.8.2, 2.2, 2.3 & 3.3.3
<p>Safety:</p> <ul style="list-style-type: none"> ▪ Heavy operational vehicle traffic could put walkers and bikers at increased risk. ▪ Increase in traffic and heavy operational vehicles on the road could increase traffic accidents. ▪ Temporary roads open in the winter could increase cabin break-ins when nobody is around. ▪ More roads near cabins will increase the amount of people roaming around the area, especially hunters. 	<p>It is anticipated the vehicular operators and non-vehicular users of the roadway would abide by local traffic speed limits and operate their vehicles in a safe manner.</p> <p>Proposed temporary roads do not lead to private property or increase existing access to private property. It is assumed that the users of the temporary roads will not engage in illegal activity</p> <p>The Recreation Opportunity Spectrum identified in the Forest Plan for this area is Roded Natural in the General Forest Management Area (Forest Plan page 3-45). Interactions between users may be moderate to high, with evidence of other users prevalent.</p>	1.8.2 & 2.2.1
<p>BWCAW –</p> <ul style="list-style-type: none"> ▪The proposals could affect the well-being of the BWCAW. The proposals could disrupt to the ecosystem that surrounds the BWCAW. 	The existing untrammeled, undeveloped, natural, and primitive and unconfined recreation aspects of the BWCAW would be unchanged by this project since there are no activities proposed within the BWCAW. There would be no exploration activities within the BWCAW from this project. However, noise from the proposed drilling operations could have an affect on the opportunity for solitude within the BWCAW.	1.8.2, 1.8.4, 3.2, & 3.3
RMV in BWCAW – The proposals could illegal ATV and snowmobile access into sensitive areas of the BWCAW.	There are no proposed temporary roads that lead into or near the BWCAW.	2.3, 3.3, & Appendix A
Heavy equipment could degrade FR 181, the access road to BWCAW entry points 32 and 33.	All existing Forest Service system roads used by companies to haul equipment require a road use permit. This permit requires roads to be maintained to Forest Service standards or repaired at companies' expense to Forest Service standards. Companies are also bonded by Bureau of Land Management. If the forest Service determines that roads/drill sites are not rehabilitated appropriately, this money is used for that purpose.	1.8.2 & 3.3
BWCAW Water Quality – The proposals could have detrimental effects on water resources in the BWCAW.	Due to the scope of potential effects, flow patterns and distance to the BWCA, there are no anticipated effects on the water resources within the BWCA.	1.8.2 & 3.1
BWCAW Soils – The proposals could affect soils in the BWCAW	There are no proposed activities in the BWCA. Hence, there would be no effect on the soils within the BWCA.	1.8.2 & 2.3

Issue Topic	Rationale for Non-significant Issue	Where Addressed in the EA
Permits/Leases – What is the statutory authority for Hardrock mineral activity on the Superior NF?	See section 1.6.1 Authorities.	1.6.1
Drilling & Water Quality/Wetland Effects– concern that there will be impacts to wetlands even in frozen ground conditions from operations and access.	The equipment used will be similar to that used in logging activities. As a result of broad experience, Forest Plan Standards and Guidelines would be applied to minimize impact to the soil resource. (Forest Plan, Table G-WS-8 and G-WS-8a, pages 2-16 – 2-17)	1.8.2, 2.2.2.4, & 3.6, & 3.7
Crossing leased property during operations could expose summer homes to risk of damage.	Operators would not need to cross recreation residence leased property in order to accomplish their proposed operations.	2.2.2, 2.3, and Appendix A
Drilling Operations – Monitoring/Compliance with Stipulations and Mitigations – Operations could increase the risk of fire.	Vehicles and drills would be equipped with fire-fighting equipment. Minimizing fire risks requirements are addressed in the Standard Stipulations for the permits and lease and in the proposed plans of operation.	2.2.1.1, 2.2.1.3, 2.2.2, & Appendix A
Toilets/Garbage– Concern that there will not be sanitary facilities for operators and environmental damage would result.	During drilling, trash and waste would be stored in suitable containers and removed from the site for disposal. The proposed Plans of Operations submitted by Duluth Metals, Encampment, and Franconia address maintaining clean work sites. The existing stipulations also address maintaining conditions at the work sites.	2.2.1.1, 2.2.1.2, 2.2.1.3, 2.2.2 & Appendix A
Shipstead-Newton-Nolan Act – concern that there be a 400-ft setback from the Kawishiwi river.	All proposed drill sites are greater than 400 feet away from the South Kawishiwi River and are consistent with the Shipstead-Newton-Nolan Act. The existing stipulations for the permits and lease address the need for operations to be consistent with this act.	2.2.1.1, 2.2.1.2, 2.2.1.3, 2.2.2, & 3.8.6
Forest Plan consistency – concern that temporary roads are not consistent with the Forest Plan	The Forest Plan provides objectives, standards and guidelines relating to temporary roads. (Forest Plan, G-WS-12 , pg 2-15; G-WS-8, 2-16; G-WS-8a, pg 2-17; O-TS-3, pg 2-49; S-TS-3, G TS-13, and G TS-14, pg 2-50)	1.3, 1.4 & 1.8.2
The proposals could devalue the “true” or “inherent” values of the area.	Exploration drilling has been taking place in the vicinity of the proposed exploration and recreation sites, such as the South Kawishiwi River Campground and the South Kawishiwi River itself for the past 40 years. The Recreation Opportunity Spectrum identified in the Forest Plan for this area is Roaded Natural in the General Forest Management Area (Forest Plan page 3-45). Interactions between users may be moderate to high, with evidence of other users prevalent.	1.8.2 & Chapter 3
Economics – the proposals could affect the value of the land and the cabins (summer home group).	Land value is outside the scope of this analysis. The proposed actions are consistent with the of the management area direction within the project area.	1.3, 1.5, & 1.8.2

Issue Topic	Rationale for Non-significant Issue	Where Addressed in the EA
LRMP – concern that the Forest Plan does not address exploration.	<p>The Forest-wide Management direction desired condition for minerals states:</p> <ul style="list-style-type: none"> ▪ D-MN-1 - Explorations and development of mineral and mineral material resources is allowed on National Forest System land, and; ▪ D-MN-2 – Ensure that exploring, developing, and producing mineral resources are conducted in an environmentally sound manner so that they may contribute to economic growth and national defense.(Forest Plan, page 2-9) 	1.3, 1.4, & 1.8.2
Cost/Benefits – Recreation v. Mining, etc – concern that the proposal could affect the area’s reputation for clean, clear lakes and river, which would affect tourist economy.	<p>Exploration drilling has been taking place in the vicinity of the proposed exploration and recreation sites, such as the South Kawishiwi River Campground and the South Kawishiwi River itself for the past 40 years. The Recreation Opportunity Spectrum identified in the Forest Plan for this area is Roaded Natural in the General Forest Management Area (Forest Plan page 3-45). Interactions between users, such as between recreationists and exploratory drilling, may be moderate to high, with evidence of other users prevalent.</p>	1.0.1, 1.8.2 & 3.2

1.8.3 Other Resource Concerns

Table 1.4 lists other resource concerns identified through scoping efforts and it provides information on why these concerns are not issues for this project and analysis.

Table 1.4 Other Resource Concerns Identified in Scoping

Other Resource Concerns	Why This Not an Issue	Where Addressed in the EA
Recreation Residences - Broad concerns about impacts from drilling	<p>Broad concerns are addressed through Projects design and existing stipulations for the prospecting permits and hardrock leases. The recreation residence use is within the context of not only existing minerals exploration rights, but also other National Forest Management activities.</p>	1.0.1, 2.2, 3.2 & 3.3

Other Resource Concerns	Why This Not an Issue	Where Addressed in the EA
Water Quality – concern with potential effects from drilling operations and access on the quality of surface and ground water. Fluid leaks from drilling equipment could end up in water resources. What will be the effect to local well water?	Permit and Lease stipulations, project design, and Forest Plan direction (Forest Plan 2-13 - 2-18) would eliminate and minimize effects on water quality. Further discussion on water quality is in section 3.6.	2.2.1, 2.2.2 2.5 & 3.6
Fisheries - concern with potential effects from mining on fisheries	Permit and Lease stipulations, project design, and Forest Plan direction (Forest Plan 2-33 & 2-36) would eliminate and minimize effects on fisheries resources.	2.2.1, 2.2.2, 3.4, 3.5 & Appendix B
Air Quality – concern that drilling operations and site access could decrease air quality (specifically dust and fine particles)	The activities included in the project description are not expected to generate enough particulate matter to threaten the National Ambient Air Quality Standard.	3.8.3
Forest age and species – concern that the proposals would negatively affect forest resources.	No substantial effects would result to the vegetation making up the stands where temporary roads and drill pads would be established. Only about 9 acres would have any vegetation removed within 39 stands totaling about 950 acres. Existing stipulations and project design address potential revegetation needs.	2.2.1.1, 2.2.1.3, 2.2.2.8, & 3.8.1
Soils - concern that drilling operations could disturb soils, erosion and sedimentation are of particular concern.	The area affected would be limited to soils within areas disturbed by drilling operations and temporary road construction. Permit and Lease stipulations, project design, and Forest Plan direction (Forest Plan 2-16 - 2-18) would eliminate and minimize effects on soils.	2.2.2.3 & 3.7
Invasive Species – Temporary roads and other ground disturbing activities could increase non-native invasive species, including spread into the BWCAW.	Under all the action alternatives, the risk of spread of Non-Native invasive species (NNIS) would be small because of: NNIS design feature described in section 2.2.2.6, and the heavy use of winter temporary roads and winter drilling operations.	2.2.2.6 & 3.8.4
Threatened, Endangered And Sensitive Species – Wildlife and Plants – The proposals (especially clearing underbrush, snow packing activities) could negatively affect threatened, endangered, and sensitive species (especially bald eagle, osprey, lynx, large-leaved Sandwort).	As discussed in sections 3.4 and 3.5, there could be effects on threatened, endangered and sensitive species. These sections summarize the findings of the BE. Overall, none of the proposed activities would likely cause a trend towards federal listing or a loss of viability. For further information please see the BE (Appendix B).	3.4, 3.5, & Appendix B

Other Resource Concerns	Why This Not an Issue	Where Addressed in the EA
<p>Effects on Wildlife –</p> <ul style="list-style-type: none"> ▪ Operations could disturb wildlife from noise and air pollution or destroy their habitat (owls, osprey, eagles, lynx, moose, bear, deer, other mammals, insects, birds). ▪ Low flying aircraft could negatively effect wild animals. 	<p>Minor direct effects could occur in the form of disturbance (drill operations, helicopter, vehicle traffic) to animals and den sites while activities are taking place; these effects are expected to be minimal and discountable because activities will be of short duration and reach. The biological evaluation in Appendix B and summarized in sections address effects on threatened, endangered, and sensitive species of wildlife.</p>	<p>3.4, 3.5, & Appendix B</p>
<p>Heritage (Cultural) Resources – Ground disturbing activities could affect heritage sites.</p>	<p>No known heritage sites would be impacted by the proposed mineral exploration</p>	<p>2.2.2.7 & 3.8.2</p>
<p>Water Quality – The proposals could reduce the water level in South Filson Creek to critically low level and could be polluted by contaminated surface, ground and seepage water.</p>	<p>The effects on the flow and water quality are recognized as potential effects and discussed in Section 3.6. Project design features in section 2.2.2 have been developed to protect water flow and quality in streams, including South Filson Creek.</p>	<p>2.2.2, & 3.6</p>
<p>BWCAW Water Quality – The proposals could pollute the South Kawishiwi River by contaminated surface, ground and seepage water, thereby degrading the wilderness.</p>	<p>Due to the scope of potential effects, disturbance area in relation to the watershed area of the South Kawishiwi River, and mitigation measures there are expected to be negligible effects to the South Kawishiwi River. The effects to the water quality of the South Kawishiwi River are discussed in Section 3.6 and the measures are described in Section 2.2.2.4. Due to the scope of potential effects, flow patterns and distance to the BWCA, there are no anticipated effects on the water resources within the BWCA.</p>	<p>1,8.2, 2.2.1, 2.2.2.4, & 3.6</p>
<p>Analyze BWCAW as a Resource – Concern that impacts from the proposals to the BWCAW should be analyzed separately.</p>	<p>The scope of the analysis and the potential impacts to the BWCA are addressed throughout this Environmental Assessment. Effects analysis boundaries have been defined by resource in Chapter 3.</p>	<p>1.8.1, 1.8.2, 1.8.3, 1.8.4, 2.5, 3.6, 3.2, & 3.3</p>
<p>Helicopters – Helicopter access close to the BWCAW could cause extreme noise, and be a visible and audible disruption to BWCAW visitors.</p>	<p>Visitors to the BWCAW utilizing the South Kawishiwi River Entry Point may hear infrequent and brief helicopter operations at the drill site staging area that is about 1½ miles away from the entry point.</p>	<p>2.3.2, 2.4, 3.3, & Appendix A</p>
<p>Mining & BWCAW – The proposals could result in loud noises that could intrude into the BWCAW.</p>	<p>Section 3.2 of the EA addresses noise impacts of the proposed mineral exploration activities.</p>	<p>3.2 & 3.3</p>

Other Resource Concerns	Why This Not an Issue	Where Addressed in the EA
BWCAW Recreation – Noise and changes in scenery from the proposed activities could adversely affect wilderness visitors and the wilderness characteristic of the BWCAW	The change in the amount of noise that could be potentially heard in the BWCAW would be equal to or less than what may be heard at Entry Points #32 South Kawishiwi River. None of the proposed drilling would be visible from the BWCAW.	1.8.3, 3.2, & 3.8.6

1.8.4 Scope of Analysis

Table 1.5 describes the scope of analysis for this project in terms of the BWCAW and future mining.

The USDA Forest Service has developed guidelines and methods for wilderness monitoring within the General Technical Report Monitoring Selected Conditions Related to Wilderness Character: A National Framework (Project File). This report defines the four qualities of wilderness defined in the report are addressed in Table 1.5.

Table 1.5 Concerns Relating to the Scope of Analysis

Topic	Why This is Outside the Scope	Where Addressed in This EA
BWCAW: <i>Untrammelled</i> –wilderness is essentially unhindered and free from modern human control or manipulation.	The existing untrammelled nature of the BWCAW would be unchanged by this project since there are no activities proposed within the BWCAW. There would be no ground or vegetation disturbed within the BWCAW from this project.	1.0.1, 1.3, 1.4, 1.5, 1.8.2, 1.8.3, 1.8.4, 3.2 & 3.3
BWCAW: <i>Undeveloped</i> –wilderness is essentially without permanent improvements or modern human occupation.	Since this project would not create any permanent improvements or human occupation within the wilderness, the undeveloped quality of the BWCAW would not be affected.	
BWCAW: <i>Natural</i> –wilderness ecological ecosystems are substantially free from the effects of modern civilization.	The existing natural character of the BWCAW would be unchanged by this project since the project and would not change ecological ecosystems in the wilderness. There would be no activities in the BWCAW.	
BWCAW: <i>Outstanding opportunities for solitude or a primitive and unconfined type of recreation</i> –wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.	Since there would be no operations within or adjacent to the BWCAW, there would be no effects on the BWCAW in terms of the primitive or unconfined recreation experiences available in the BWCAW. However, noise from the proposed drilling operations could have an affect on the opportunity for solitude within the BWCAW.	1.0.1, 1.3, 1.4, 1.5, 1.8.2, 1.8.3, 1.8.4, 3.2 & 3.3

Topic	Why This is Outside the Scope	Where Addressed in This EA
<p><i>Future mining</i> related to the permits and leases addressed in this analysis and Polymet's Northmet Project operations.</p>	<p>Future mining resulting from exploration efforts proposed for this project are not considered in the effects analysis of this EA because:</p> <ul style="list-style-type: none"> ▪ They are highly speculative not reasonably foreseeable. The proposed activities are for exploration (rather than mine development) because there is not enough information to reliably indicate where and how mining would occur, what would be mined, or when it would take place. Therefore, effects to the human environment from mine development would not be meaningfully evaluated. ▪ The scope of this project relates to the consideration of the proposed plans of operations for minerals exploration. ▪ Mining operations that may result will go through its own environmental analysis process, most likely documented in a Environmental Impact Statement. Prospecting permits do not entitle permittee to a preference right lease. ▪ Polymet's Northmet mining and Ploymet's exploratory drilling are not connected actions. Those activities do not overlap in time or space with this project therefore the effects cannot be cumulative. Mining operations considered in Polymet's Northmet proposals are about 20 – 30 miles southwest of this project area and within a different watershed. In terms of air quality, whatever small amount of dust is generated the Kawishiwi Mineral s Exploration would settle out quickly and not travel far from the drilling site. In addition, any potential effects from this project would have dissipated by the time the Northmet mining would likely commence (about 10 years from the conclusion of this project). Effects analysis boundaries have been defined by resource in Chapter 3, PolyMet is not included in the geographic scale for analysis (as described in each resource section). 	<p>1.6.2.4, 1.8.2, 1.8, 2.2.1.2, & Chapter 3</p>
<p><i>Lands –</i></p> <ul style="list-style-type: none"> ▪ Under what authority were the lands acquired for the lands involved in this project? ▪ Are the actions consistent with the purposes for which the land was acquired? 	<p>The prospecting permits and lease are located on public domain land except for approximately 100 acres on the lease on the north side of the Kawishiwi River. No activities are proposed on the acquired parcels. Therefore, the question whether the proposed actions are consistent with the purposes for which the land was acquired does not apply.</p>	<p>1.0.1, 1.4, 1.6, & 1.8.4</p>
<p><i>Past permit and lease decisions –</i> The project is too constrained, need to:</p>	<p>The three active prospecting permits and lease involved in the project were issued by the BLM with the consent of the Forest Service and are considered valid active permits and lease. Issuance</p>	<p>1.0.1, 1.4, 1.6, & 1.8.4</p>

Topic	Why This is Outside the Scope	Where Addressed in This EA
<ul style="list-style-type: none"> ▪ include the initial leasing and permitting decisions by the BLM, ▪ include these decisions in the analysis, and ▪ include two additional leases. 	<p>of permits and leases is outside of the scope of the analysis. In addition, there is one additional lease held by BBJV but since there are no proposed activities on the lease, addressing permitting of that lease is outside of the scope of the analysis.</p>	
<p><i>Granting mineral leases –</i></p> <ul style="list-style-type: none"> ▪ close to the BWCAW and with the lack of extensive environmental review prior to granting the leases. ▪ regulations require federal agencies to conduct supplemental environmental review in the event that substantial time has passed since the permit was granted and the permitted action taken. 	<p>The lease was issued by the BLM in 1966 prior to NEPA. The lease grants the lessee rights for a 20-year initial term with three additional 10-year renewal terms. An environmental analysis was completed by the Forest Service in 1987 for the first renewal. In 2004, the Forest Service reviewed the lease and gave consent for the second renewal citing there are no changes in land use that would require modifications to the current lease stipulations; the terms, conditions and stipulations are sufficient to protect resources; and all operations are subject to the Forest Plan and its amendments, approval of an operating plan, and subject to an analysis under the NEPA.</p>	<p>1.0.1, 1.4, 1.6, & 1.8.4</p>

Chapter 2 – Alternatives

2.0 Introduction

This chapter describes and compares the alternatives considered for the Kawishiwi Minerals Exploration Project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

2.1 Alternative 1 - No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. No mineral exploration activities for the proposed operating plans would be implemented for the Encampment Resources and Duluth Metals prospecting permits and for Franconia's proposal on BBJV's lease. No changes in surface and subsurface resources would result from the proposed activities. Choosing the No Action Alternative is not a viable alternative since the existing prospecting permits and leases give the companies the right to perform mineral exploration in accordance with the terms, conditions and stipulations of their permits. CEQ regulations require the analysis of the no action alternative even if the agency is unable to choose this alternative. The analysis of the no action alternative provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives.

2.2. Activities Common to Alternatives 2 and 3

All access and exploration work would be conducted according to applicable rules and regulations of the US Departments of Interior and Agriculture and the State of Minnesota as set forth in a Plan of Operation. Since the state of Minnesota has authority over surface water use and down hole additives, all operations would also be monitored by the State of Minnesota, Department of Natural Resources.

2.2.1 Prospecting Permit and Lease Stipulations

2.2.1.0 Bureau of Land Management Hardrock Prospecting Permit Stipulations

The following are BLM requirements under the three prospecting permits considered in this EA:

1. Bond. The permittee shall file with the appropriate Bureau of Land Management office a permit bond precedent to permit issuance in the amount of \$1000 for the use and benefit of the United States to ensure surface and sub-surface reclamation. An increase in the amount of the permit bond maybe required upon approval of a final exploration plan or at any other time during the life of the permit, to reflect changed conditions.
2. Extension. To qualify for an extension of the permit, the permittee must drill or excavate at least one exploration hole, trench or test pit, or perform other comparable exploration, e.g., substantial amounts of work described in stipulation No. 4. The requirements may be waived by the Authorized Officer if the permittee is unable to comply due to conditions beyond the permittee's control or for other reason provided by 43 CFR 3562.9-1.
3. Supervision. The Authorized Officer located at the Bureau of Land Management, Milwaukee District Office, Division of Solid Minerals, 1901 Pine Street, Suite 201, Rolla, Missouri,

- 65401 is responsible for the review and approval of exploration plans and modification thereof, inspection and enforcement of requirements, and is the recipient of quarterly reports.
4. Exploration Resulting in No Surface Disturbance. Prior to conducting activities on the permit area which do not disturb the surface or surface resources, e.g., geological mapping, geochemical surveys, ground and aerial geophysical surveys, and sampling of outcrops and old workings, the permittee shall notify the Authorized Officer, in writing, when such activities will commence, and thereafter furnish the Authorized Officer quarterly reports on the progress and results of such activities, including maps, narrative, and analyses as available on the date of the reports.
 5. Exploration Resulting in Surface or Surface Resource Disturbance. Prior to conducting activities which disturb the surface and surface resources on the permit area, the permittee will submit to the Authorized Officer for review and approval two copies of a final exploration plan or of additional information which, when added to the exploration plan submitted prior to issuance of the permit, will provide the Bureau of Land Management with sufficient information to show in detail the proposed exploration, prospecting, or testing to be conducted. After the plan is approved, the permittee shall furnish the Authorized Officer a written notice of when the approved activities will commence, and thereafter furnish the Authorized Officer quarterly reports on the progress and results of the exploration. The quarterly reports shall include maps, logs, analyses, cross sections, or other graphic illustrations showing the geologic and physical mode of occurrence of the deposit as available on the date of the report period. Exploration plans may be changed by mutual consent of the Authorized Officer and the operator at any time to adjust to changed conditions or to correct and oversight. To obtain approval of a changed or supplemental plan, the operator shall submit a written statement of the proposed changes or supplement and the justification for the changes proposed. If circumstanced warrant, or if development of an exploration plan for the entire operation is dependant upon unknown factors which cannot or will not be determined except during the progress of the exploration, a general plan may be approved and supplemented from time to time with sight-specific information. The operator shall not, however, perform any exploration except under an approved plan.
 6. Discovery Data. In the event permittee applies for a preference right lease, the said quarterly reports and supplementary data required by the Authorized Officer will be used to determine whether or not the permittee has discovered a valuable deposit. The supplementary data will indicate the extent of the deposit, the physical and geological mode of occurrence, the average grade as established prior to permit exploration, the anticipated mining and processing methods, the anticipated location, kind and extent of necessary surface disturbance and measures to be taken to reclaim that disturbance. Valuable deposit is a deposit of character that further expenditure of labor means is justified with a reasonable expectation, not necessarily a demonstrated certainty, of success in developing a valuable mine.

2.2.1.1 Standard Forest Service Stipulations for Prospecting Permits

The following are the standard Forest Service stipulations in the three prospecting permits considered in this EA:

All work and any operations authorized under this permit shall be done according to an approved operating plan on file with the Forest Supervisor at 8901 Grand Avenue Place, Duluth, MN 55808-1102. Plans generally require a minimum of 45 days for Forest Service review. The Bureau of Land Management must also review and approve the plan.

The Operating Plan will contain information the Forest Officer determines reasonable for assessment of (1) public safety, (2) environmental damage, and (3) protection for surface resources. The content of such plans will vary according to location and type of activity and may contain:

1. Steps taken to provide public safety.
2. Location and extent of areas to be occupied during operations.

3. Operation methods including size and type of equipment.
4. Capacity, character, standards of construction and size of all structures and facilities to be built. [No structures or facilities are proposed.]
5. Location and size of areas where vegetation will be destroyed or soil laid bare.
6. Steps taken to prevent and control soil erosion.
7. Steps taken to prevent water pollution.
8. Character, amount, and time of use of explosives or fire, including safety precautions during their use. [Explosives and fire are not proposed.]
9. Program proposed for rehabilitation and revegetation of disturbed land.

Copies of all permits obtained from State or Federal agencies pertaining to work might be required. Archeological studies, if required, will accompany the plan.

The Forest Supervisor or his/her designated agent has authority to temporarily suspend or modify operations in whole or in part due to emergency forest conditions such as high fire danger or other unsafe situations. The permittee must keep the District Ranger informed about the progress of operations to the extent reasonably necessary for assuring public safety. This is especially important with geophysical inventory and testing activities because of their mobile nature. The District Ranger will alert the permittee to circumstances which may affect safe and efficient conduct of work activities.

Terms of these permits are considered violated if not done according to these stipulations.

2.2.1.2 Special Forest Service Stipulations and Notifications for Prospecting Permits

The following are the special Forest Service stipulations in the three prospecting permits considered in this EA:

1. Pursuant to the provisions of the act of March 4, 1917 (16 USC 520), Section 402 of the Re-organization Plan No. 3 of July 16, 1946 (60 Stat. 1097, 1099), the Act of August 7, 1947 (30 USC 352), and the National Environmental Policy Act of 1969 (42 USC 4321 et seq.) as said authorities have been or may hereafter be amended, no mineral development of any type is authorized hereby, and consent to the issuance of this prospecting permit as required by law and regulation (43 CFR 3500.9-1(b)) is given subject to the express stipulation that no mineral lease may be issued for the land under permit without the prior consent of the Forest Service, USDA and the proper rendition of an environmental analysis in accordance with the National Environmental Policy Act of 1969, the findings of which shall determine whether and under what terms and conditions for the protection of the land involved the lease may issue.
2. No drilling within 400 feet of the shoreline of any lake or stream is authorized without the written approval of the Forest Supervisor.
3. No drilling within 1/4 mile of an eagle or osprey nest from February 15 through October 11 of each year. Significant land disturbance is not allowed within 660 feet of an eagle or osprey nest at any time.
4. An environmental analysis must be completed before an operating plan can be approved. Basic steps in the process include public involvement, archeological surveys, plant surveys, and biological evaluations. Plant surveys must be completed both in the spring and late summer. The level of analysis would depend on the amount of ground disturbing activity associated with prospecting activities, issues raised by the public, and environmental concerns. For example, if an operating plan that proposes drilling were submitted it may take about one year to complete the surveys and environmental analysis before the plan could be approved. Season of operation and location of activities may be adjusted to reflect public and/or

environmental concerns. Applicants are encouraged to contact the Forest Service during their planning process to get a forecast of time needed to gain approval of operating plans.

5. The Permittee will file a report with the District Ranger upon the conclusion of all work, specifying the methods and materials used to properly plug and cap any drill holes and/or the types of material and methods used to restore any other excavations required to be restored by law, regulation, stipulation or permit provision. In addition, the permittee will provide in the report the name and telephone number of the person to contact in order to arrange for an on-site inspection of the permitted area. A negative report is required and an inspection is required regardless of the amount and type of work performed.

2.2.1.3 Stipulations in the BBJV Lease

The following are the special stipulations in the lease considered in this EA:

- (a) In conformity with the principles of the Shipstead-Newton-Nolan Act of July 10, 1930 (16 U.S.C., Sec.22), on occupancy of use of the surface within 400 feet of the shoreline of any lake or stream without written approval of the authorized officer.
- (b) Any and all operations authorized by this lease shall be done in accordance with a plan which must be submitted in triplicate and approved in writing by the Authorized Officer before such operations are begun. The operating plan will contain such provisions as the Authorized Officer may reasonably determine are needed to maintain proper administration of the lands and surface resources. Where appropriate, depending upon the location and type of operation, the Authorized Officer may require the plan to contain provisions concerning the following matters:
 1. The location and extent of areas to be occupied during operations.
 2. The methods to be used in the operations.
 3. The size and type of equipment to be used in the operation.
 4. The capacity, character, standards of construction and size of all structures and facilities to be built.
 5. The location and size of areas upon which vegetation will be destroyed or soil will be laid bare.
 6. The steps that will be taken to prevent and control soil erosion.
 7. The steps that will be taken to prevent water pollution.
 8. The character, amount, and time of use of explosives or fire, including safety precautions which will be taken during their use.
 9. The program proposed for rehabilitation and revegetation of disturbed lands.

If later operations require departure from or additions to the approved plan, revisions or amendments will be submitted in triplicate, with statements of the reason for changes or additions to the Authorized Officer for approval. Any and all operations conducted in advance of approval of an original, revised, or amended operating plan, or which are not in accord with the approved plan, constitute violations of the terms of this lease.

2.2.2 Project Design Features – Resource Stipulations

This section describes requirements identified by the Forest Service that would ensure that the operating plans meet Forest Plan direction. It also includes actions proposed by the permittees and lessee as elements of their plans of operation.

2.2.2.1 Steps to provide public safety

Areas constructed as drill sites would be open to state and federal officials, hired contractors and their employees and employees or consultants. In the interest of safety and to the extent practical, unauthorized personnel would be restricted from entering operations areas.

A stop sign would be installed on FR 1900 at its junction with FR 186.

Vehicles and drills would be equipped with fire-fighting equipment.

2.2.2.2 Location and extent of areas to be occupied

Drilling would involve some surface disturbances because of the need to prepare drill sites (including sumps for water re-circulation and settling out of drill cuttings) and the need to construct temporary access trails, but this would be minimized to the extent possible.

The location of proposed sites can be modified slightly in cooperation with the surface managers (Forest Service). The access trails shown attempt to avoid apparent wetlands areas in so far as possible. Where wet ground conditions cannot be avoided, mats would be used to minimize impact or drilling would be deferred until winter.

Within a drill site, all or part of the area may be cleared of vegetation to accommodate the drill rig and sump pit. Trees and shrubs cut during construction of the sites and access roads would be lopped and scattered to lie within three feet of the ground.

Existing access roads used to access the temporary access trails would be maintained as necessary by the company or its contractors, in compliance with specifications and instructions.

In the construction of temporary access roads and drill pad sites, all effort is made to avoid cutting of timber.

1. Slash, brush, tree limbs, seedlings and saplings cut to clear temporary roadways, would be pulled approximately 30 feet back from cleared temporary roadways.
2. Any piled trees cut or pushed over along with slash would be no higher than 3 feet high.
3. This material would be utilized in rehabilitating the temporary roads and drill pad sites once drilling operations are complete. For this reason, chipping of timber and slash would not be utilized.

2.2.2.3 Steps taken to prevent and control soil erosion

Ecological Land Type associated with the proposed exploration activities are mapped and identified in the Project File. Table G-WS-8b in the Forest Plan provides a brief description of ELTS on Superior National Forest identified in the measures below (Forest Plan, pg 2-18).

1. On ELT 2 and 6: Boring activity/access is limited to frozen soil (frozen to a depth that will support equipment that is being used and no rutting and compaction occurs.) page 2-17, G-WS-8, Table G-WS-8.
2. On ELT 14 and 2: Boring activity/access is limited to frozen soil (frozen to a depth that will support equipment that is being used and no rutting and compaction occurs) or during normal dry periods so no rutting and compaction occurs. page 2-17 Table G-WS-8a.

3. Use of wetlands under frozen condition for temporary roads and skid trails will generally be permitted as long as no fill is placed in the wetland. These roads or trails will be blocked to discourage vehicle use under unfrozen conditions. page 2-15, G-WS-12.
4. Avoid felling trees into non-forested wetlands, except where done for purposes of habitat restoration. Page 2-15, G-WS-14.
5. On access routes, appropriate water diversion structures (such as water bars) to reduce erosion should be installed and so that surface water diverted from roads into filter strips or vegetative area, rather than directly into streams, lakes, open water wetlands, etc. As recommended in Part 2 of *Sustaining Minnesota Forest Resources: Voluntary site-level Management Guidelines*, Forest Soil Productivity section. (Forest Plan, pgs 2-7 – 2-8)

2.2.2.4 Steps taken to prevent water pollution

1. The only additives, such as bentonite described in section 1.2.3.2, to the drilling water would be those permitted by the State of Minnesota Department of Health. Each site would be restored through surface grading, natural re-vegetation, and seeding as needed. Local surface water source would be used drilling operations. If no surface water is available, water would be supplied by a tanker truck. There is minimum danger of pollution because all drilling fluids are collected in the sump-pit and re-circulated. Where shallow bed rock prevents constructing a sump-pit, drilling fluids and cuttings would be collected in tanks, the water re-circulated and the drill cuttings disposed of at another site in accordance with State regulations.
2. There would be no fuel storage within a wetland. Fuel storage containers should be kept on an upland site. Absorbent mats or other absorbent material would remain under the drilling rig and extra mats would remain on site at all times to clean up any small spills from refueling. Any spills or releases of oils, fuels, or other toxic or hazardous material must be reported and remediated per applicable State and Federal Laws.
3. If a drill hole boring is to be temporarily sealed, State of Minnesota regulations would be followed. They include the requirement that the casing and cap must extend at least five feet above the potential high water within the regional flood level. High water levels would be identified and established on a case by case basis and determined by on the ground evidence of past high water.
4. Water cannot be withdrawn from streams that have less than 1 cubic feet per second flow rate. Withdrawal rates from streams shall be no more than 10% of the flow at the time of withdrawal. Withdrawal from wetlands, ponds, or lakes, shall not exceed 1% of the estimated volume of the basin at the time of withdrawal. Water intakes shall have appropriately sized screens to minimize impact to aquatic organisms.
5. Drilling, road use, and road construction would occur within a wetland only after the surfaces have been frozen enough to provide access and use without breaking through the frozen layer.
6. Sumps to treat the water used in the drilling process would be constructed (see Figure 2.3). These sumps (as described in Section 1.1.6) would contain and treat the pump water. No sump pits would be allowed for drilling in wetlands and re-circulation tanks would be required.
7. Road construction in wetlands would only be allowed during frozen conditions. Log mats placed for the crossing of wetlands shall be removed once they are no longer needed. A setback of at least 50 ft shall be maintained for drill pad disturbance from all lakes, open water wetlands, and perennial streams and rivers.



Figure 2.1: Photo of sump area (depression in dashed oval) constructed for recent exploratory drilling operation in proximity to proposed drill sites.

8. Culvert crossings would be designed and installed in accordance with geomorphic principles and accommodate aquatic organism passage. All temporary culverts and floodplain fill shall be completely removed and the temporary access roadway completely decommissioned when drilling is completed and the holes have been abandoned. Temporary access obliteration shall include brushing in, lop and scattering as well as barriers and signs.
9. All sites located in low or wet areas would only have overland access during winter months once the ground has sufficiently frozen. Helicopter support may be utilized during initial stages of the drilling operation (access before freeze-up) and/or for continuing operations beyond breakup and possibly into the summer and fall.
10. Drilling would be accomplished by licensed well drillers in accordance with State regulations.

2.2.2.5 Noise Abatement Measures

In response to public comments on the proposal, abatement measures were developed to ease some of the potential impacts the action alternatives may cause. These measures would be applied to either of the action alternatives.

Noise abatement measures would be used to reduce impact to private residences and recreation use within the project area. These measures would help disperse drilling noise upward rather than dispersing the noise generated laterally and reduce sound waves. The companies would submit a noise abatement design proposal to the Forest Service. The proposal would be reviewed, and when adequate, would be approved by the Forest Service. These measures would include:

1. Baffles: A noise abatement baffle system would be utilized such as systems incorporating absorbant synthetics manufactured by Sound Seal, or other affective methods.
2. Exhaust extension: The exhaust of the drilling engines would be extended and directed up into the air to help direct engine sound upward, rather than laterally.

2.2.2.6 Non-Native Invasive Species

Exploration requires construction of roads, pads, berms, water diversions and pits. These activities all require heavy equipment, which can transport noxious weed seeds or vegetative matter. Construction activities create disturbed sites upon which noxious weeds can become established. The companies would implement the following measures to limit the introduction of weeds on the Forest:

1. If revegetation is required, only native or desired non-native species that are certified noxious weed free seed would be planted.
2. To avoid non-native invasive species (NNIS) occurrences, skid trails, temporary roads, and landings if used in the growing season would be located away from NNIS sites.
3. Minimize removal of roadside vegetation when constructing, reconstructing or maintaining exploration and mining roads.
4. Clean all heavy-equipment and other vehicles before transporting them onto National Forest System lands. Concentrate inspection and cleaning on the undercarriage, with special emphasis on axles, frame, cross-members, motor mounts, underneath steps, running boards, and front bumper/brush guard assemblies. Sweep vehicle cabs and deposit refuse in waste receptacles. The companies would contact the Forest Service and allow them to inspect heavy equipment before they are transported onto National Forest System lands.
6. The Forest Service will monitor all current and recently closed exploration and mine sites for noxious weeds. If weeds are found, the company is responsible for treating the weed infestation in accordance with Forest Service requirements or may choose to fund the Forest Service to treat the weeds.

2.2.2.7 Other Resource Protection Measures

1. During drilling, trash would be stored in suitable containers and removed from the site for disposal.
2. No explosives or firearms would be permitted on the project. Fires would be permitted only in specific heating devices (salamanders, cook stoves, etc.) and all state and federal

- fire laws and regulations would be observed to prevent and suppress fires in the areas of operation.
3. No structures or facilities would be built.
 4. Cultural surveys have been conducted on proposed Plan of Operations, if during the course of exploration, any artifacts, cultural features or other archaeological items are discovered, operations would immediately cease and the Bureau of Land Management and the Forest Service would be notified so that the potential significance of the material can be assessed and a possible plan for mitigation can be prepared.
 5. The District Ranger would be given advance notification of any activity that could involve hazards to public safety and suitable action would be taken to protect the public.
 6. The District Ranger would be notified at least 2 weeks in advance of the start up of all activities under the operating plan. This includes all activities in future years such as permanently sealing drill borings, geophysics, and final reclamation.
 7. The District Ranger would be notified yearly on the company's intent to permanently seal drill borings and when final reclamation will take place.
 8. The Minnesota DNR, BLM and Forest Service would monitor drilling activities. The Forest service monitoring effort would include site visits during operations and until final reclamation is successful. Monitoring of water resources may include water quality sampling and testing (if necessary) of surface and/or groundwater. If this is necessary, the companies would be responsible for the costs associated with these activities.

2.2.2.8 Reclamation

The companies will be required to secure a reclamation bond with the BLM before the plans of operations are approved. This bond will include Forest Service reclamation requirements. The companies would complete interim and final reclamation. These include:

Interim Reclamation:

- Removing all equipment, trash, and other materials;
- Temporarily sealing the exploratory borings in accordance with state regulations;
- Collecting all drill cuttings and placing them in the sump pits before they are backfilled;
- Backfilling sump pits (no recirculation tank was used), with stockpiled soil;
- Re-contouring the disturbed sites to blend in with the natural topography and to stabilize the soils;
- Pulling back brush and slash and spreading it over all disturbed sites;
- Seeding disturbed areas, if deemed necessary by the Authorizing Officer, with a native plant seed mix made up of grasses, shrubs, and forbs;
- Maintaining access routes and other disturbed sites to assure the soils are stabilized and erosion will not occur during interim closure;
- Reclaiming site access temporary road entrance closure per Forest Plan direction on temporary roads and road decommissioning (Forest Plan, page 2-50) and as illustrated in Appendix G.

Final reclamation:

- Removing all equipment, trash, and other materials;
- Permanently sealing borings as per Minnesota Department of Health Rules. Bore hole casings are removed or cut below grade if they cannot be removed. The boring is grouted to permanently seal the hole and to protect groundwater.

- Collecting all drill cuttings and placing them in the sump pits before they are backfilled;
- Backfilling sump pits (if no recirculation tank was used) with stockpiled soil;
- Re-contouring the disturbed sites to blend in with the natural topography and to stabilize the soils;
- Pulling back brush and slash and spreading it over all disturbed sites;
- Seeding disturbed areas, if deemed necessary by the Authorizing Officer, with a native plant seed mix made up of grasses, shrubs, and forbs;
- Reclaiming site access temporary road entrance closures per Forest Plan direction on temporary roads and road decommissioning (Forest Plan, page 2-50) and as illustrated in Appendix G.

Table 2.1: Proposed Activities

Proponent Company	Permit or Lease	Size of Drill Pads* (feet)	Number of Drill Pads	Total Acres of Drill Pads	Miles of Temporary Roads Alt 2	Helicopter Operations	Geophysical Surveying
Duluth Metals	Permit	50'x80'	10	0.9	1.1	No	No
Encampment	Permits	50'X50'	41	2.4	4.0	Yes	Yes
Franconia	Leases	100'x100'	23	5.3	2.1	No	Yes
Totals	~	~	74	8.6	7.2	~	~

*Size of drill pad varies by company due to differences in equipment to be used.

Table 2.2: Roadway Information

Topic	units	Alt 1	Alt 2	Alt 3
Length of access on existing system roads	miles	0	8.3	8.3
Number of temporary road segments	number	0	32	31
Length of temporary road segments	miles of new construction	0	6.6	6.9
	miles of old road or trail bed	0	0.6	0.6
	total miles	0	7.2	7.5

2.3 Alternative 2 - The Proposed Action

Figure 2.2: Alternative 2 – Proposed Action displays the estimated locations of the proposed drilling sites and proposed temporary roads. The following proposed plans of operations for the permits and leases are summaries of the complete plans of operations in Appendix A. Alternative 2 also includes the project design features identified in sections 2.2.2.1 – 2.2.2.8.

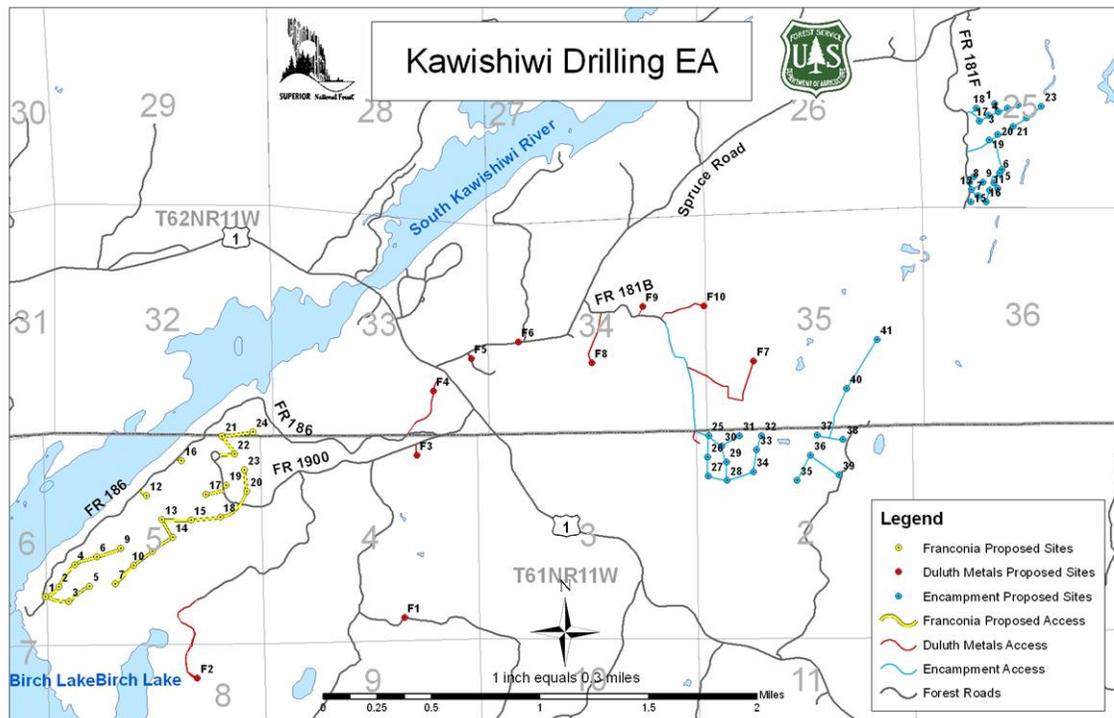


Figure 2.2: Alternative 2 – Proposed Action

All drill sites and access routes considered in this EA would be delineated on the ground by the operators and inspected and approved by Forest Service personnel before operations commence. The water sources would be approved by the Minnesota DNR as needed.

The scope of the mineral exploration activities included in the Proposed Action is briefly identified in Tables 2.1 and 2.2.

2.3.1 Duluth Metals, Ltd.

Location and size of areas where vegetation would be cleared or soil laid bare

Duluth Metals has identified 10 sites for exploratory core drilling and proposes construction of about 1.1 miles of temporary roads in order to access these drill site locations. About 0.6 miles of the temporary roads would be on routes that were previously used as a roadway. Existing roads would be used to access five of the sites while the remaining would require new construction. The total area occupied by the ten sites would total about 1 acre.

An area of approximately 50 feet by 80 feet would be cleared of vegetation and utilized at each drill site. A sump would be excavated to contain return water and core cuttings. Cuttings would remain in the sump and buried at completion of operations.

Operation methods including size and type of equipment

Truck and skid mounted drill rigs would be utilized. The rigs would operate 24 hours a day in two 12 hour shifts. Each hole would require two to three weeks to complete. Support equipment would include a D-5 or comparable dozer, a skid or trailer mounted dray for storing drill pipe, a skid or trailer mounted equipment shed and one or more four wheel drive trucks for fuel, water and supply transport. Two or more drill rigs may be used to accomplish this program in the allotted timeframe. To minimize the number of sites established for drilling more than one hole could be drilled at each drill site; one vertical and others directionally at an angle.

Water Source

The proposed sources of drill water would be an un-named stream in the center of section 4, T61N R11W, and from adjacent wetlands with standing open water. Water would be pumped to most drill sites.

2.3.2 Encampment Resources Inc.**Location and size of areas where vegetation will be cleared or soil laid bare**

Encampment has proposed two forms of exploration. First, they propose geophysical surveys. The purpose of these surveys is to define further ground targets that would be tested by diamond core drilling. These surveys require a series of east-west orientated grid lines spaced 400 feet apart. Underbrush along each line is cut and cleared by hand to make a 2 to 3 foot wide path that would allow access by foot during the surveys. Geophysical surveys which include magnetics, inducted polarization and electromagnetic profiling, consist of recording various readings from hand held instruments at various points along the grid line.

The second form of exploration is diamond core drilling. Encampment Resources has proposed 41 drill sites within their prospecting permit boundaries. The proposed drilling operation would commence after the geophysical surveys or as soon as ground freeze-up occurs.

Each proposed new drill site would affect an area approximately 50 by 50 feet of surface. Ground conditions and/or new geophysical results may result in drill sites being adjusted in the field by 100 to 500 feet from their original location. The same site would generally be used for more than one drill hole in order to minimize surface disturbance. Drilling results would determine whether all the proposed sites are utilized during the exploration program and in some cases the number of holes that would be drilled at a specific site. Surface area disturbance would be approximately 2.5 total acres. Construction of temporary roads would be approximately 4.0 miles. About 0.6 miles of the temporary roads would be on routes that were previously used as a roadway.

Within each site, all or part of the area would be cleared of vegetation to accommodate the drill rig (with sump pit). Disturbance at drill sites would be limited to the cleared area and would include a 5' x 15' by 10' - deep pit to contain returned water and drill cuttings.

Operation methods including size and type of equipment

The sump pit would be constructed by a tract-mounted backhoe. However, if the area is swamp, above-surface stock tanks would be used instead of the sump pit. Tanks would be regularly cleaned of cuttings and hauled to an approved sump pit constructed on higher ground.

Standard skid-mounted diamond-bit core rig would be used to do the drilling. Support equipment would include a skid-mounted rod dray, a D-4 or comparable dozer, and a two-or three-axle flatbed truck for transporting water, pipe, and other equipment. Four-wheel-drive pickups would be used to transport personnel and service the drill rigs.

Water Source

The proposed source of drill water would be South Filson Creek. Water would be pumped to most drill sites, although it may be advantageous to truck the water to drill sites that are close to established roads.

2.3.3 Franconia Minerals Corporation**Location and size of areas where vegetation will be cleared or soil laid bare**

Approximately 31 holes drilled at 23 sites are proposed. At some sites up to three holes would be collared at the same location but would be drilled with different inclinations and/or azimuths. Approximately 2.1 miles of temporary roads would be constructed. None of these temporary roads would be on routes that were previously used as a roadway. The access trails shown attempt to minimize the use of the existing road that serves the cabins. Normally access is by upgraded trail, approximately 12 feet wide, from which trees and underbrush have been cleared. If geophysical surveys are conducted this may require clearing of narrow trails through underbrush to lay out required cables.

Each drill site would affect an area approximately 100 by 100 feet. Surface area disturbance would be approximately 5.5 total acres. Disturbance at the drill site would be limited to the cleared area and would include a 30 to 60 by 20 by 20 foot pit (sump pit) to contain return water and drill cuttings.

Operation methods including size and type of equipment

Operations proposed consist largely of diamond core drilling but may also include some surface and down-the-hole geophysical surveys, geologic mapping and soil and rock chip geochemical surveys.

A standard truck-mounted diamond core drill would be used. Support equipment may include a skid-mounted rod dray, a D-8 or comparable dozer, an excavator, a high lift and two or three axle trucks for transporting water, pipe, fuel and other equipments and drill core.

Water Source

The proposed source of drill water would be the Kawishiwi River, or other sources that are most accessible to the drill site and would require the least disturbance to obtain access. Water would be trucked to drill sites or, where more advantageous, pumped to drill sites from nearby water sources.

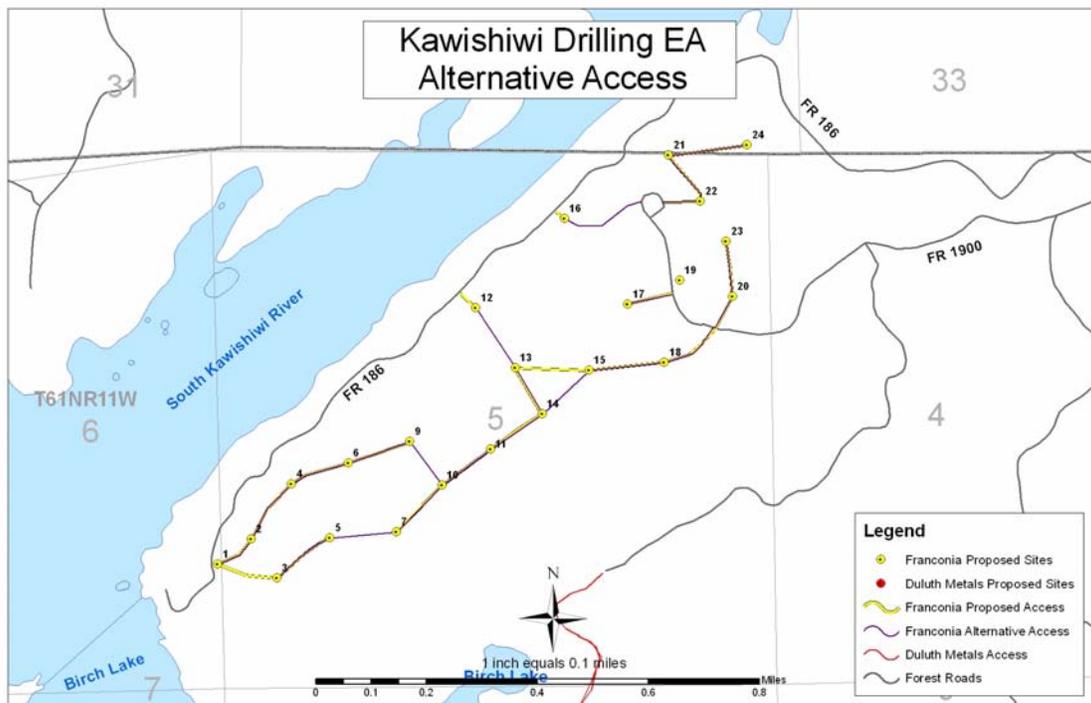


Figure 2.3: Franconia Exploration Drilling Sites Temporary Roads Access for Alternative 3

2.4 Alternative 3

Alternative 3 differs from Alternative 2 with the following changes to address the significant issues:

- ❑ It relocates temporary road access proposed from FR 186 to FR 1900 to access drill sites in the vicinity of recreation residences as proposed in Franconia plan of operations (see Figure 2.3),
- ❑ It does not allow using helicopters to access sites as proposed in the Encampment plan of operations, and
- ❑ It allows just “Frozen Conditions” for drilling operations for all three proposed plan of operations.

Alternative 3 also includes the project design features identified in sections 2.2.2.1 – 2.2.2.8.

2.5 Comparison of Alternatives

Table 2.3 provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2.3: Comparison of Alternatives by Issue Indicators

Indicator		Alternative 1	Alternative 2	Alternative 3
Drilling Sites and Days of Operations Noise Affecting Recreation	All Season	0 drill sites	29 drill sites	0 drill sites
	Days of Operations	0	507.5 Noise will affect non-winter recreation	0 No noise impact to non-winter recreation
	Frozen Only Conditions	0 drill sites	45 drill sites	74 drill sites
	Days of Operations	0	787.5 Noise will affect winter recreation as well as non-winter	1295 Noise will impact only winter recreation.
Decibels of Operations That Can Be Heard	South Kawishiwi River Recreation Residences	50-70 decibels No Change	52-72.5 decibels Not Likely To Be Perceptible	52-72.5 decibels Not Likely To Be Perceptible
	South Kawishiwi Campground	40-60 decibels No Change	42.7-63.0 decibels Perceptible	42.7-63.0 decibels Perceptible

Indicator		Alternative 1	Alternative 2	Alternative 3
	BWCAW Entry Points #32 and #33	30-50 decibels No Change	32.2-53.0 decibels Perceptible	32.2-53.0 decibels Perceptible
Location of Temporary Roads		0 temporary roads – No impacts to FR 186 from drilling operations traffic.	3 temporary roads off of FR 186 – trucks, noise, potential rough road conditions during operations.	0 temporary roads off of FR186 – Minimal impacts to FR 186 from drilling operations traffic.
Noise from Method of Access		No effects from helicopters moving drilling equipment to proposed sites.	Potential noise from helicopters would have greater chance of being heard at residences in vicinity of Spruce Road and FR 181F.	No effects from helicopters moving drilling equipment to proposed sites.
Effects on TES Species		No Change	Lynx – less compacted snow than Alt. 3. More disturbance during breeding season and more ground disturbance to plants than Alt. 3.	Lynx – more compacted snow than Alt. 2. Less disturbance to breeding animals and less ground disturbance to plants than Alt. 2.

(Source Chapter 3 Environmental Consequences and Project File)

2.6 Alternatives Considered but Eliminated from Detailed Study

The NEPA implementation guidelines (40 CFR 1500) developed by the Council on Environmental Quality (CEQ) require that an environmental review must “...rigorously explore and objectively evaluate all reasonable alternatives”. The courts have established that this direction does not mean that every conceivable alternative must be considered, but that selection and discussion of alternatives must permit a reasoned choice and foster informed public participation and decision-making.

Some of the comments submitted by the public regarding the Proposed Action included suggestions for alternatives. Some of the public’s suggested alternatives were already part of, or incorporated into, the design of the alternatives. Some of the comments resulted in the identification of significant issues and as a result helped develop the action alternatives which are considered in detail in Chapter 3. Other comments were identified as being outside the Project’s purpose and need, or would result in undesirable effects.

Table 2.4 Alternatives considered but eliminated from detailed study, rationale for why they were not studied in detail, and where the concern is addressed in the EA (if it is addressed in the EA).

Alternative Considered but Eliminated from Detailed Study		Rationale for Elimination
A	Use chipping process for vegetation removed in clearing temporary roads and drill pads.	Any vegetation removed from access routes and/or drill sites would be lopped and scattered. This process ensures that the removed vegetation can be utilized in reclamation efforts. Lopped and scattered vegetation would be pulled back on to disturbed areas and spread once operations have been completed and reclamation can take place. A chipping process would not allow the vegetation to be used in this manner.
B	Relocate proposed drill sites to minimize or eliminate impacts to private property owners and recreation residences that are also lease holders.	An individual drill hole may be relocated by one to two hundred feet in the immediate vicinity of the proposed drill site to avoid or minimize impacts to resources at the site (such as to minimize removing trees or avoid an individual sensitive plant or heritage site if they were to be found). In addition, this project cannot be done without some disruption either from noise or small changes in traffic. Relocating drilling to points that would have no impact on nearby private property owners would not meet the purpose and need shown in section 1.4. The companies would not be able to conduct mineral exploration drilling and geophysical activities that would allow them to collect geologic information and drill core samples that may be used to analyze, map and discover the presence and extent of minerals. The No Action alternative displays what the effects would be if drilling operations are not audible in sections 3.2 and 3.3.
C	Construct another access to FR 1900 rather than utilize any part of FR 186 to avoid effects on FR 186 from drilling operations traffic.	The desired condition for the road system described under D-TS-2 of the Forest Plan (pg 2-47) is that the National Forest road system is the minimum needed to provide adequate access to NFS land. New roads built to access land for resource management will be primarily OML 1 or temporary and not intended for public motorized use. Temporary roads will be decommissioned after their use is completed (Forest Plan, O-TS-3, pg 2-49). FR 186 is an operation maintenance level (OML) 4 road. An OML 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced (Forest Plan page Glossary-18) (FSM 7709-58).

The interdisciplinary team considered Alternatives A - C shown in Table 2.4, for their potential as a reasonable alternative. Alternatives may not be carried forward for detailed study for one or all of the following reasons:

1. Did not meet the Project's purpose and need
 - a. Operating plans - permit holders and lease holder to obtain core samples of the federal minerals so they can determine the location and extent of minerals being explored
 - b. EA - ensure that exploration of mineral resources is conducted
 - i. in an environmentally sound manner (Forest Plan D-MN-2, page 2-9),
 - ii. consistent with the terms of the permits and lease and
 - iii. consistent with the goals and objectives and standards defined in the Forest Plan.
 - c. Project - address the minerals exploration on specific sites proposed by Duluth Metals, Encampment Resources, and Franconia.

- d. Project - consistency with Forest Plan direction.
- e. The BLM needs the following actions to be addressed in this project:
 - i. updating existing applications with an updated drilling calendar schedule.
 - ii. Providing down hole information regarding the size of their holes and casing specifics.
 - iii. Methods of proposed drilling including planned use of specific drilling additives.
 - iv. Methods for abandoning drill holes and drilling site restoration plans.
- 2. Did not follow Forest Plan direction
- 3. Did not comply with applicable environmental law
- 4. Would result in unacceptable environmental impacts
- 5. Was a duplication within the existing alternatives