



# Mineral Resource Exploration and Development

June 2011

On the Superior National Forest (SNF), on-going and new mineral exploration and development are on the increase. Activities include federal hard rock mineral prospecting permit and lease applications; operating plan proposals involving geophysical surveys, core drilling, and temporary road construction activities; two active granite dimension stone quarries; numerous sand and gravel operations; one large mineral material contract; and exploration for precious metals within both federal and privately held mineral estates through core drilling, geophysical surveys, and associated temporary road and site construction.

Orderly exploration, development, and production of mineral and energy resources on national forest lands to help meet the present and future needs of the Nation is consistent with the Forest Service (FS) mission and with the SNF Forest Plan. The Forest Plan desired condition for minerals states "...that exploration, development, 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). The SNF works collaboratively with tribal government, the State of Minnesota, other federal agencies, industries, and the public to identify issues associated with projects proposed on national forest lands and to determine potential mitigations.

In accordance with the Forest Plan, no permit, lease, or other authorization will be issued for exploration or development of minerals owned by the United States within the Boundary Waters Canoe Area Wilderness, Mining Protection Areas, and wild segments of designated wild and scenic rivers. The National Forest System lands outside of these areas (approximately (1,214,976 acres) are available for federal and private mineral exploration and development, subject to environmental evaluation and permit requirements. Extensive surface mining may not be consistent with management policy on national forest lands acquired under the Weeks Act.

## CURRENT MINERAL EXPLORATION AND DEVELOPMENT

### ***Dimension Stone Production***

Cold Spring Granite Company has two dimension stone quarries contracts on the Superior National Forest. Both quarries have been in production since 1993. The Forest issued updated five year contracts in 2009 and 2010. The contracts include new operating plans, updated reclamation bonds, and additional mitigation stipulations. The rock is quarried (cut) into large blocks using diamond saws. The blocks are then shipped to the company's facility at Cold Spring, Minnesota for further processing. The typical end products generally fall into three categories:

1. Building Stone (Interior and exterior facing, paving and curbing, tile, counter tops and furniture)
2. Memorialization (markers, monuments and crypt fronts)
3. Industrial (surface plates, acid tanks, finished slabs, rough blocks (processed at company facility off-site))



Lake Superior Green Granite Quarry



The Mesabi Black quarry is located on the Kawishiwi Ranger District near Harris Lake, south of Ely, MN. The rock is a medium grained, homogeneous, black, anorthositic gabbro. The Lake Superior Green quarry is located on the Tofte Ranger District near Katydid Lake, east of Isabella, MN. The rock at this site is a coarse grained, dark green, gabbroic anorthosite.

### Cold Spring Dimension Stone Production on the Superior National Forest

Quarry	2006	2007	2008	2009	2010 thru June	2011 <i>projected</i>
Mesabi Black Quarry	83,811.1ft <sup>3</sup> (\$59,314.19)	76,159.9 ft <sup>3</sup> (\$67,247.51)	101,237.23ft <sup>3</sup> (\$88,814.02)	71,366.59ft <sup>3</sup> (\$63,125.27)	56,931.8ft <sup>3</sup> (\$50,711.34)	110,000ft <sup>3</sup> (\$96,350.00)
Lake Superior Green Quarry	17,153.7 ft <sup>3</sup> (\$16,502.19)	19,429.4ft <sup>3</sup> (\$18,459.28)	15,041.69ft <sup>3</sup> (\$14,685.85)	12,083.69ft <sup>3</sup> (\$12,141.97)	6,111ft <sup>3</sup> (\$6,538.80)	20,000ft <sup>3</sup> (\$18,950.00)

### Mineral Materials – Sand & Gravel



Typical Gravel Pit

The Superior National Forest has 397 gravel pits within the Forest. In 2009, the Forest issued 143 mineral material permits which equates to:

Private Sales: 213,256 tons  
 Administrative Use: 6,896 tons  
 Free Use: 39,387 tons  
 259,548 tons @ \$265,549

In 2010, the Forest issued 141 mineral material permits which equates to:

Private Sales: 173,341 tons  
 Administravtive Use: 54,734 tons  
 Free Use: 10,777 tons  
 238,852 tons @ \$222,641

Forest Service administrative use includes road building and maintenance, trail building and maintenance, parking and other recreational area maintenance. The SNF may issue free use permits for mineral materials to private individuals and non-profit organizations for up to 5 cubic yards of hand loaded material. Larger private sales are issued to individuals and companies seeking volumes greater than 5 cubic yards.

### Large Mineral Material Contract

The Superior National Forest has one large on-going mineral material contract. The contract is issued to Seppi Brothers Concrete Products out of Virginia, Minnesota. The aggregate quarry has been in operation by Seppi Brothers since 1984. Similar to the dimension stone quarries, the five year contract was renewed in December 2010 and included an updated operating plan, reclamation bond, and mitigation stipulations. Material from the quarry is used by Seppi Brothers in their concrete products; including concrete, paver and landscape blocks, and building blocks. Over the life of the current five year contract, Seppi Brothers will have purchased 400,000 cubic yards of sand and gravel at a value of \$380,000.



Typical Mineral Bearing Rock

### Hardrock Minerals Exploration and Development for Metals

The presence and abundance of metal mineralization in northeastern Minnesota, primarily iron ores, has been known and mined for well

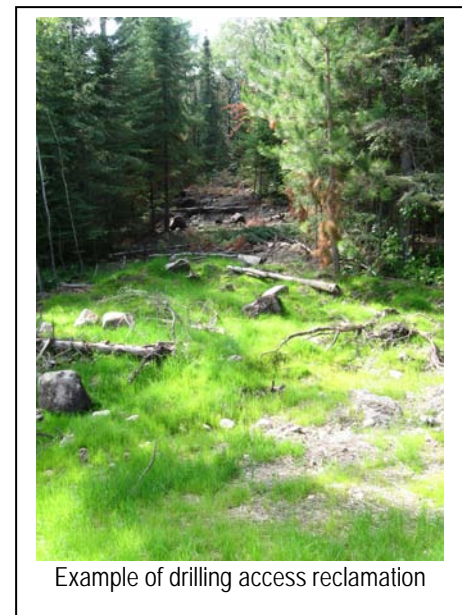
over 120 years and has played a pivotal role in the development of local communities in the region. In the past 60 years, there has been particular interest in a geologic formation under the Forest called the Duluth Complex and in the last 10 years, this interest has intensified. The complex contains deposits and unknown potential resources of non-ferrous metals, including copper, nickel, cobalt, platinum, palladium, gold, silver and zinc.

Exploration is done by private companies to determine if an ore body exists and if so, the extent and location of ores. Exploration targets both federal and privately owned minerals. Most of the activity involves drilling, geophysical surveys, access route construction and reconstruction.

The Bureau of Land Management (BLM) manages federal leasable hardrock minerals in Minnesota. Mineral ownership varies across the Forest. There are approximately 470,500 acres where the FS manages the land surface and subsurface minerals are federally owned. The FS cooperates with the BLM in environmental analysis and permitting for proposed federal hardrock mineral prospecting and lease permits, exploration operating plans, and mine development projects. On 744,500 acres where the SNF manages the land surface and the subsurface mineral rights are privately owned, the forest cooperatively negotiates with the mineral owner/proponent in reviewing and concurring with their mineral exploration proposal. If a mine is eventually proposed, the SNF cooperates with the Minnesota Department of Natural Resources, U.S. Army Corps of Engineers, and American Indian Bands in the environmental analysis and permitting process.

#### Encampment Minerals Inc. Private Mineral Exploration Projects

In February 2011, after completing environmental analysis', the SNF concurred with three private mineral exploration projects proposed by Encampment Minerals, Inc. All three projects involve reserved private mineral estates on the Laurentian Ranger District. Reserved mineral estates occur when the FS acquires a piece of land and the previous owner retains, or reserves, the mineral rights. In the case of these projects, Encampment Minerals Inc. leased the mineral rights. Project activities include core drilling, geophysical surveys, and associated temporary access and drill site construction. A total of 6 core drilling sites, associated geophysical surveys, and 1.82 miles of temporary road construction were permitted for the three projects. To date, only one of the 6 core drilling sites and 0.98 miles of temporary access road has been completed at one of the projects. This site and temporary access route has had interim reclamation completed and is monitored for effectiveness.



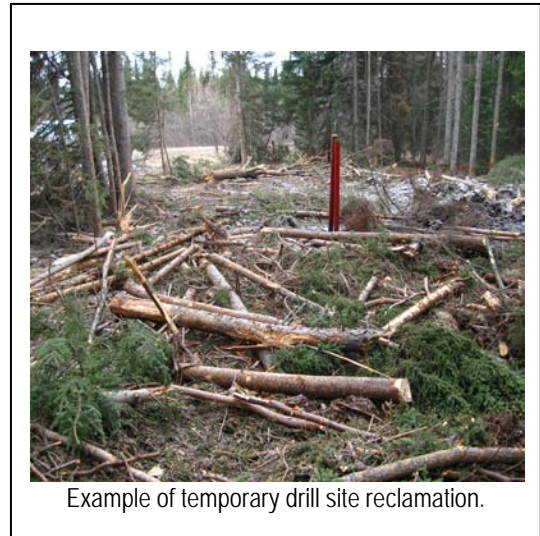
Example of drilling access reclamation

#### PolyMet Mining Inc. NorthMet Private Mineral Exploration Drilling Project

In February 2009, after completing an environmental analysis, the SNF concurred with a mineral exploration proposal from PolyMet Mining, Inc. The project involves leased reserved private mineral estates on the Laurentian Ranger District. Project activities include drilling on 123 exploration drill sites, soil borings, and constructing approximately 0.51 miles of temporary road access. At all of the completed sites, final reclamation the temporary access road closure has been completed. These sites are monitored for reclamation and closure effectiveness.

Encampment Minerals Inc., Franconia Minerals Corp., and Duluth Metals Corp., Federal Minerals Exploration Projects

In November 2007, the Kawishiwi Minerals Exploration Environmental Assessment was completed and three separate federal mineral exploration operating plans were approved for three companies (Encampment Minerals, Inc., Franconia Minerals Corp., and Duluth Metals Corp.). Two were on BLM prospecting permits and one was on a BLM hardrock mineral lease. Activities for the three projects include 74 core drilling sites and 7.5 miles of temporary access route construction. To date, 14 core drilling sites have been completed and 1.6 miles of temporary roads have been constructed by two of the three companies. Interim reclamation and temporary site and access road closure has been completed at all 14 core sites and 1.6 miles of access road. These sites and access routes are still active and final reclamation has yet to be completed. The Forest Service monitors these sites for the effectiveness of the interim reclamation.



Example of temporary drill site reclamation.

**MINERALS PROJECTS UNDER ANALYSIS**



Example of non-federal land under consideration for exchange.

***PolyMet NorthMet Project***

In 2000, PolyMet Mining Inc. (PolyMet) initiated the process to gain permits for a new copper-nickel-platinum palladium group metals mine called the NorthMet Project near Hoyt Lakes. This project would involve open pit development of privately held reserved and outstanding mineral rights where the Forest Service manages surface resources. Most of the lands involved in the Project were acquired by the United States under the authority of the Weeks Act which restricts the Forest Service from allowing large surface mining as proposed by PolyMet. SNF and PolyMet have identified possible parcels for a land exchange as a way to overcome conflicting interests associated

with the proposed open pit operation. The Forest Service is a co-lead agency with the Minnesota Department of Natural Resources and U.S. Army Corps of Engineers in the environmental impact statement for the mine proposal and proposed land exchange with PolyMet.



Typical Drill Site Set-up

***Federal Hardrock Minerals Prospecting Permits Project***

The Bureau of Land Management (BLM) has received federal hard rock mineral prospecting permit applications to conduct federal hardrock mineral exploration activities that include drilling and geophysical surveys on the Forest. According to Federal law and mineral policy, the BLM must evaluate the applications in conjunction with the Forest Service and coordinate the required environmental documentation prior to permit and operating plan approval. As the lead agency, the Forest Service must complete an environmental analysis to decide whether to give consent to the BLM for the issuance of prospecting permits and operating plans, and the stipulations under which those permits and plans may operate.

The SNF initiated public scoping in 2009 for the Federal Hardrock Mineral Prospecting Permits Environmental Impact Statement (EIS) project. It will analyze the effects associated with 33 federal hardrock mineral prospecting permit applications, one permit extension for four years, and 21 operating plans and the associated special use permits needed for access and road construction. This EIS will also analyze the predicted effects of future federal hardrock mineral permit applications and their potential four-year permit extensions and operating plans and the associated special use permits needed for access on a forest-wide basis for the next 20 years. The project area covers approximately 470,497 acres.

The Draft EIS was circulated for review and comment on April 1, 2011. The comment period ends June 30, 2011. The final EIS is expected to follow in 6 to 9 months.

**FOR MORE DETAILS FOR THESE PROJECTS:** Contact Loretta Cartner, Forest Geologist at 218-626-4382.

