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PUBLIC PARTICIPATION DOCUMENTS

For

Kennecott Eagle Minerals Company
Humboldt Township, Marquette County, Michigan

PERMIT TO INSTALL APPLICATION NUMBER

405-08

October 7, 2009

FACT SHEET

October 7, 2009

Purpose and Summary

The Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD), is proposing to act on Permit to Install Application No. 405-00 from Kennecott Eagle Minerals Company (KEMC). This application is for the reuse of the existing Humboldt Mill facilities for the processing of copper and nickel ore. The Humboldt Mill facilities have not been operated since the late 1990s. No smelting activities are proposed. The proposed project is subject to permitting requirements pursuant to MDEQ Rules, including the Rules for Air Pollution Control. The MDEQ is holding a 84-day public comment period and a public hearing to allow all interested parties the opportunity to comment on the proposed Department actions, including the AQD Permit to Install. The decision-makers will consider all relevant information received during the comment period and hearing before taking final action.

Background Information

The Humboldt Mill facilities are located at 4547 County Road 601 in Humboldt Township, Marquette County, Michigan. It is approximately 24 miles southwest of the City of Marquette. The ore processed at the facility will be received from the recently permitted Eagle Mine (located approximately 25 miles to the north) as well from other locations. All ore will be brought to the facility via transport trucks.

If approved, it is projected that remodeling of the existing facility would begin in early 2010 and operation of the facility would commence in late 2010 or early 2011. The maximum ore processing rate through the facility is projected to be approximately 2,220 tons per day, while the average processing rate through the facility is projected to be approximately 2,070 tons per day. In addition to refurbishing and reusing existing buildings and equipment at the facility, new equipment and buildings will also be installed. Except for disposal of the waste tailings, all operations at the facility will be aboveground. No other underground activities are proposed.

The ore received at the facility will be processed through a series of size reduction steps and then placed into flotation cells to separate the mineral-bearing materials from the non-economic gangue material (tailings). Upon receipt at the facility, the ore will be stored in an enclosed crushed ore storage area (COSA). Final nickel and copper concentrate product will be loaded into rail cars and shipped off-site for further processing. Tailings will be processed and conveyed through a double-walled tailings slurry pipe to the Humboldt Tailings Disposal Facility (HTDF) located north of the site. The HTDF is a previously mined pit area in which residual process tailings that contain sulfide minerals have already been placed. The pit is filled with water above the tailings.

A variety of reagents will be used in the milling and the flotation processes. While most of these reagents will be stored and used inside the mill building, lime and soda ash will be off-loaded and stored outside in storage silos equipped with bin vents. Other supporting equipment for the mill will include front-end loaders, an emergency generator, a metallurgical laboratory and space heating equipment. The main structures at the facility will include the COSA, a secondary crusher building, a transfer station, an office/maintenance building, a mill building, and a concentrate load-out building.

Haul trucks will deliver ore to the mill into the enclosed COSA. This building will have a storage capacity of about 20,000 tons. Ore will be managed in the COSA by front end loaders which will deposit material into the dump hopper feeding the primary crusher. The primary crusher will be a jaw crushing unit located in an area physically separated from the main COSA. Primary crushing will reduce the ore to less than 100 millimeters (mm). A rock breaker will be available at the primary crusher to break up approximately 5% of the material that may be oversized. The dump hopper, the grizzly feeder, the primary crusher, and the rock breaker will all be equipped with water sprays to control particulate emissions.

After primary crushing, ore will be fed by the secondary crusher feed conveyor to the secondary and tertiary screening and crushing processes. The secondary crusher unit and screens will be installed at the west end of the secondary crusher building, while the tertiary system will be located on the east end of the building. The secondary and tertiary crushers will be cone type crushers operating in a closed circuit arrangement to generate crushed ore at 100% passing 12mm.

Crushed ore will exit the secondary crusher building via the secondary and tertiary screen discharge conveyors, both transferring to the transfer conveyor. The transfer conveyor will be covered. The transfer station will be an enclosed structure housing the transfer point between the transfer conveyor and the mill feed conveyor.

The crushed ore will enter the mill building on the existing refurbished plant feed conveyor. The ore will be conveyed to four 2,000 tonne fine ore storage bins. Only two of the four bins will be in use at any one time. Ore will be fed from the fine ore storage bins to the grinding mills (ball mills) through existing vibrating feeders onto existing refurbished ball mill feed conveyors. Particulate emissions from these feeders will be controlled by a baghouse dust collector.

Grinding will be performed by two refurbished 900 hp Harding ball mills which will grind ore to a size of 80% passing 80 microns. At this stage, all material will be handled in a wet state. Ore slurry will be discharged into sumps and be fed to two hydrocyclone clusters, one per ball mill. Slurry will be pumped using horizontal centrifugal slurry pumps to the primary cyclone clusters. Hydrocyclone underflow will report back to the ball mills. Hydrocyclone overflow (final grinding circuit product) will flow by gravity to the bulk flotation circuit. Soda ash, lime and sodium sulfite will be added to the ball mill flows.

Following the grinding process, material will be managed in a series of flotation cells, including bulk rougher, bulk cleaner and scavenger flotation cells to remove gangue material in the form of tailings and prepare process materials for the final stages of flotation cell treatment. Concentrate passing flotation cell treatment will be routed to the copper rougher and cleaner flotation circuits. Tailings slurry from the copper rougher circuit will constitute the nickel concentrate and will flow by gravity to a sump, then be pumped to the nickel concentrate thickener. Copper concentrate from the copper cleaner flotation cell will be pumped to the copper concentrate thickener.

The concentrates will be thickened and pumped to agitated concentrate filter feed tanks, one for nickel and one for copper. Concentrate from the tanks will be pumped to automatic pressure filters where the moisture content of the material will be reduced to as low as 8% moisture in the filter cake. Concentrate from the pressure filters will be discharged onto conveyors which transport the concentrate to the new concentrate load-out building. Within the load-out building, concentrates will be conveyor-dropped into separate piles and loaded on to the next available rail car by front-end loader. Upon filling each rail car, the product will be secured with either loading hatches or tarps prior to transport off-site.

Tailings slurry separated in the cleaner scavenger flotation cells will be pumped to the tailings thickener. The thickener reduces the water in the slurry to produce tailings with approximately 60% solids content. The tailings are then pumped to the HTDF where they will be deposited at a specific depth by a barge.

Reagents are used in the milling process to assist in separating the particles rich in target metals from those particles with low levels of target metals. Reagents are also used to adjust the pH of various process streams. The reagents that will be used are:

> SIPX and methyl isobutyl carbinol (MIBC) are added to the ore slurry for the flotation processes. The mineral rich ore particles are made hydrophobic by the reagents and upon aeration, they escape the water by attaching to the air bubbles, rising to the surface to form a froth. The froth is removed to produce the concentrate.
>
> Magnafloc 155 is used as a flocculant in the nickel, copper, and tailings thickening processes. Flocculants cause solutes to form colloids and other suspended particles that can be physically separated from the solvent, which in this case is water.
>
> Sodium sulfite, lime, and soda ash are used to adjust slurry pH and enhance the other reactions.

With the exception of MIBC, the reagents will be delivered to the facility in granular form and particulate matter emissions may be generated from handling them. MIBC is a liquid. All reagents will be added to mix tanks where the concentration can be monitored and where complete dissolution will take place.

Key Review Issues

- **Federal Regulations** – The dump hopper, grizzly feeder, primary jaw crusher, rock breaker, secondary screen, secondary crusher, tertiary screen, tertiary crusher, two fine ore storage bins, all associated transfer conveyors, and the concentrate loadout operations are all subject to the federal Standards of Performance for New Stationary Sources (NSPS) 40 CFR Part 60 Subpart LL for metallic mineral processing plants. NSPS Subpart LL sets mass and opacity emission limits for these various operations. It also establishes specific reporting and testing requirements.

- **Criteria Pollutants Modeling Analysis** – Computer dispersion modeling to predict the impacts of the air contaminant emissions was performed for particulate matter less than 10-microns in diameter (PM10) and lead (Pb). The maximum impacts for PM10 are all well below the applicable National Ambient Air Quality Standards (NAAQS) and the Prevention of Significant Deterioration (PSD) increments. The maximum impacts for Pb are all well below the applicable NAAQS. There is no PSD increment for Pb. The modeling guidelines applicable to this source require the use of only the most recent year of meteorological data. However, the KEMC modeling analysis was based on five years of meteorological data to provide results that are more conservative than what is required for typical sources of this size. Modeling results are listed in Appendix A.

- **Rule 225 Toxics Analysis** - The MDEQ's Rules for Air Pollution Control require an evaluation of the concentration of toxic air contaminants (TACs) to determine if the air emission will meet the allowable health-based screening levels. TACs are defined as any air contaminant for which there is no National Ambient Air Quality Standards (NAAQS). The TACs evaluated for this application were arsenic, cobalt, copper, manganese, and nickel. The TAC analysis shows that the proposed maximum impacts from the Kennecott facility will be well below the applicable screening level. Results are listed in Appendix B.

- **Fugitive Sources** - Fugitive particulate emissions would be produced by storage piles, handling and transfer of ore, handling and loading of concentrate, vehicles traveling on paved and unpaved roads, and rail transport of concentrate materials. A variety of control practices are proposed to reduce the fugitive emissions, which include a requirement that all transport trucks entering the facility be covered and that all railcars exiting the facility be covered or enclosed. These are addressed in the Fugitive Dust Control Plan. If the permit is approved, this plan will be included as part of the conditions of the permit.

Key Aspects of the Draft Permit Conditions

- **Particulate Emission Limits (PM and PM10)** – The draft permit includes allowed particulate emission limits for the secondary crusher building (FGSECONDCRUSH) and the two fine ore storage bins and associated drop points (EUFINEORESTORAGE). The limits are in the form of pounds of particulate per 1000 pounds of exhaust gases for PM and pounds per hour for PM10.

- **Fugitive Particulate Emissions** – The company is proposing to maintain the following fugitive particulate emitting activities (i.e. items not equipped with exhaust stacks) - vehicle traffic, material storage piles, and concentrate loadout activities. The draft permit includes limits on the amount of truck traffic allowed at the facility. It also requires that all storage piles at the facility be located within enclosed buildings. Finally, It includes a Fugitive Dust Control Plan outlining additional control practices and work standards intended to reduce fugitive emissions.

- **Control Requirements** – The draft permit includes the following restrictions:

  - The equipment within the secondary crusher building and the two fine ore storage bins and associated drop points would be allowed to operate only with the baghouse dust collectors installed and operating properly. The baghouse dust collectors are designed to reduce particulate emissions by a minimum of 99%.
  - The mill feed conveyor would be allowed to operate only with the water spray installed and operating properly. This conveyor must also be equipped with a cover whenever it is in use.
  - The dump hopper, grizzly feeder, primary crusher, and rock breaker would be allowed to operate only with the water sprays installed and operating properly.
  - The secondary feed conveyor, secondary screen conveyor, tertiary screen conveyor, and two concentrate conveyors would be allowed to operate only with the covers installed and operating properly.

- **Stack Testing** – The draft permit includes the following requirements:

  - To verify particulate and visible emissions, testing of the secondary crusher building and the two fine ore storage bins and associated drop points would be required. This testing is mandated by NSPS 40 CFR Part 60 Subpart LL.

  - To verify visible emissions, testing of the following equipment is mandated by NSPS 40 CFR Part 60 Subpart LL: conveyors and transfer points proceeding the two ball mills, dump hopper, grizzly feeder, primary crusher, rock breaker, and concentrate loadout operations.

Conclusion

Based on the information provided and the analyses conducted to date, the AQD concludes that the proposed reuse of the existing Humboldt Mill facilities for the processing of copper and nickel ore will comply with all applicable federal air quality requirements and with all Michigan MDEQ, AQD regulations. Based on these conclusions, staff has developed draft permit terms and conditions attached to this Fact Sheet, which would ensure that the proposed facility design and operation are enforceable and that sufficient testing, monitoring, recordkeeping, and reporting would be performed to determine compliance with these terms and conditions. If the air permit application is deemed approvable, the AQD delegated decision-maker may determine a need for additional or revised conditions to address issues raised during the public participation process.

If you would like additional information about this proposal, please contact Mr. Mark C. Mitchell, AQD, at 517-373-7077.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1201	Requires an Air Use Permit for new or modified equipment that emits, or could emit, an air pollutant or contaminant. However, there are other rules that allow smaller emission sources to be installed without a permit (see Rules 336.1279 through 336.1290 below). Rule 336.1201 also states that the Department can add conditions to a permit to assure the air laws are met.
R 336.1205	Outlines the permit conditions that are required by the federal Prevention of Significant Deterioration (PSD) Regulations and/or Section 112 of the Clean Air Act. Also, the same types of conditions are added to their permit when a plant is limiting their air emissions to legally avoid these federal requirements. (See the Federal Regulations table for more details on PSD.)
R 336.1224	New or modified equipment that emits toxic air contaminants must use the Best Available Control Technology for Toxics (T-BACT). The T-BACT review determines what control technology must be applied to the equipment. A T-BACT review considers energy needs, environmental and economic impacts, and other costs. T-BACT may include a change in the raw materials used, the design of the process, or add-on air pollution control equipment. This rule also includes a list of instances where other regulations apply and T-BACT is not required.
R 336.1225 to R 336.1232	The concentration of each toxic air contaminant present in the outdoor air must be less than specified levels. These levels, called the initial risk screening level (IRSL) for cancer causing air contaminants and the initial threshold screening level (ITSL) for non-cancer causing air contaminants, are health-based standards. Air Quality Division toxicologists develop these standards following the methods in the rules. The standards are designed to protect all humans, including the most sensitive populations such as the young, elderly, and ill.
R 336.1279 to R 336.1290	These rules list equipment to processes that have very low emissions and do not need to get an Air Use permit. However, these sources must meet all requirements identified in the specific rule and other rules that apply.
R 336.1301	Limits how air emissions are allowed to look at the end of a stack. The color and intensity of the color of the emissions is called opacity.
R 336.1331	The particulate emission limits for certain sources are listed. These limits apply to both new and existing equipment.
R 336.1370	Material collected by air pollution control equipment, such as dust, must be disposed of in a manner, which does not cause more air emissions.
R 336.1401 and R 336.1402	Limit the sulfur dioxide emissions from power plants and other fuel burning equipment.
R 336.1601 to R 336.1651	Volatile organic compounds (VOCs) are a group of chemicals found in such things as paint solvents, degreasing materials, and gasoline. VOCs contribute to the formation of smog. The rules set VOC limits or work practice standards for existing equipment. The limits are based upon Reasonably Available Control Technology (RACT). RACT is required for all equipment listed in Rules 336.1601 through 336.1651.
R 336.1702	New equipment that emits VOCs is required to install the Best Available Control Technology (BACT). The technology is reviewed on a case-by-case basis. The VOC limits and/or work practice standards set for a particular piece of new equipment cannot be less restrictive than the Reasonably Available Control Technology limits for existing equipment outlined in Rules 336.1601 through 336.1651.
R 336.1801	Nitrogen oxide emission limits for larger boilers and stationary internal combustion engines are listed.
R 336.1901	Prohibits the emission of an air contaminant in quantities that cause injurious effects to human health and welfare, or prevent the comfortable enjoyment of life and property. As an example, a violation may be cited if excessive amounts of odor emissions were found to be preventing residents from enjoying outdoor activities.
R 336.1910	Air pollution control equipment must be installed, maintained, and operated properly.
R 336.1911	When requested by the Department, a facility must develop and submit a malfunction abatement plan (MAP). This plan is to prevent, detect, and correct malfunctions and equipment failures.
R 336.1912	A facility is required to notify the Department if a condition arises which causes emissions that exceed the allowable emission rate in a rule and/or permit.
R 336.2001 to R 336.2060	Allow the Department to request that a facility test its emissions and to approve the protocol used for these tests.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.2801 to R 336.2804 Prevention of Significant Deterioration (PSD) Regulations **Best Available Control Technology (BACT)**	The PSD rules allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the National Ambient Air Quality Standards (NAAQS). The regulations define what is considered a large or significant source, or modification. In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing the BACT. By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities. In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.
R 336.2901 to R 336.2903 and R 336.2908	Applies to new "major stationary sources" and "major modifications" as defined in R 336.2901. These rules contain the permitting requirements for sources located in nonattainment areas that have the potential to emit large amounts of air pollutants. To help the area meet the NAAQS, the applicant must install equipment that achieves the Lowest Achievable Emission Rate (LAER). LAER is the lowest emission rate required by a federal rule, state rule, or by a previously issued construction permit. The applicant must also provide emission offsets, which means the applicant must remove more pollutants from the air than the proposed equipment will emit. This can be done by reducing emissions at other existing facilities. As part of its evaluation, the AQD verifies that no other similar equipment throughout the nation is required to meet a lower emission rate and verifies that proposed emission offsets are permanent and enforceable.

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – National Ambient Air Quality Standards (NAAQS)	The United States Environmental Protection Agency has set maximum permissible levels for seven pollutants. These National Ambient Air Quality Standards (NAAQS) are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and sulfur dioxide. Portions of Michigan are currently non-attainment for either ozone or PM2.5. Further, in Michigan, State Rules 336.1225 to 336.1232 are used to ensure the public health is protected from other compounds.
40 CFR 52.21 – Prevention of Significant Deterioration (PSD) Regulations **Best Available Control Technology (BACT)**	The Prevention of Significant Deterioration (PSD) regulations allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the NAAQS. The regulations define what is considered a large or significant source, or modification. In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing the Best Available Control Technology (BACT). By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities. In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.
40 CFR 60 – New Source Performance Standards (NSPS)	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. These New Source Performance Standards (NSPS) apply to new or modified equipment in a particular industrial category. These NSPS set emission limits or work practice standards for over 60 categories of sources.
Section 112 of the Clean Air Act **Maximum Achievable Control Technology (MACT)** **Section 112g**	In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emit, or could emit, HAPS above a certain level, one of the following two requirements must be met: 1) The United States Environmental Protection Agency has established standards for specific types of sources. These Maximum Achievable Control Technology (MACT) standards are based upon the best-demonstrated control technology or practices found in similar sources. 2) For sources where a MACT standard has not been established, the level of control technology required is determined on a case-by-case basis.

Notes:

An "Air Use Permit," sometimes called a "Permit to Install," provides permission to emit air contaminants up to certain specified levels. These levels are set by state and federal law, and are set to protect health and welfare. By staying within the levels set by the permit, a facility is operating lawfully, and public health and air quality are protected.

The Air Quality Division does not have the authority to regulate noise, local zoning, property values, off-site truck traffic, or lighting.

These tables list the most frequently applied state and federal regulations. Not all regulations listed may be applicable in each case. Please refer to the draft permit conditions provided to determine which regulations apply.

Appendix A
Criteria Pollutant Impact Summary
Kennecott Eagle Minerals Company

PSD Impact Summary

	Averaging Time	Facility's Increment Consumption ($\mu g/m^3$)	Insignificant Increment ($\mu g/m^3$)	80% PSD Increment ($\mu g/m^3$)	Combined Increment Consumption ($\mu g/m^3$)	100% PSD Increment ($\mu g/m^3$)	Increment Consumed by Facility (%)	Under Allowable Increments
PM10	Annual	4.1	1	13.6	4.1	17	24.1	YES
	24-hour	22.7	5	24	22.7	30	75.7	YES

NAAQS Impact Summary

	Total Emission Rate (lb/hr)	Averaging Time	Combined Impact ($\mu g/m^3$)	Background Concentrations ($\mu g/m^3$)	Combined and Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Meets NAAQS
PM10	1.7268	Annual	4.1	16	20.1	50	YES
		24-hour	22.7	28	50.7	150	YES
Pb	0.0001056	3 Month	0.0003	0.01	0.0103	0.15	YES

Appendix B
Toxic Air Contaminant Analysis
Kennecott Eagle Minerals Company

TAC	Emission Rate (lb/hr)	Averaging Period	Screening Level Concentration		Maximum Impact ($\mu g/m^3$)	% of Screening Level	Meets Rule 225 Limits
			($\mu g/m^3$)	Basis			
Arsenic	1.15E-05	Annual	0.0002	IRSL	0.00004	20.00	YES
Cobalt	1.06E-03	8-hour	0.2	ITSL	0.0085	4.3	YES
Copper	4.48E-02	8-hour	2.0	ITSL	0.355	17.8	YES
Manganese	1.88E-03	24-hour	0.05	ITSL	0.039	78.00	YES
Nickel	1.75E-02	Annual	0.042	SRSL	0.0078	18.6	YES