



STATE OF MICHIGAN
Department of Natural Resources and Environment

NONFERROUS METALLIC MINERAL MINING PERMIT
Part 632, Nonferrous Metallic Mineral Mining, 1994 PA 451

Permit Number: **MP 01 2010**

Date Issued: **February 9, 2010**

Issued to:

Kennecott Eagle Minerals Company
504 Spruce Street
Ishpeming, MI 49849

For the:

Humboldt Mill

Location:

T47N, R29W, Humboldt Township, Marquette County, Michigan

The Department of Natural Resources and Environment (DNRE) hereby issues this Nonferrous Metallic Mineral Mining Permit (Mining Permit) to conduct nonferrous metallic mineral mining operations to the Kennecott Eagle Minerals Company for the Kennecott Humboldt Mill Project. This Mining Permit is issued under the provisions of Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

The terms and conditions that are set forth in the Application for a Mining Permit (Permit Application) submitted by Kennecott Eagle Minerals Company (KEMC) for the Kennecott Humboldt Mill Project, including all supplemental documents amending, clarifying, or revising the initial submittal of the Permit Application (listed in Attachment 1 to this permit), and including the mining, reclamation, and environmental protection plan, are incorporated in and become a part of this Mining Permit. This Mining Permit also incorporates the attached General Permit Conditions and Special Permit Conditions.

Signed

Department of Natural Resources and Environment

Date

2/9/2010

**GENERAL PERMIT CONDITIONS
NONFERROUS METALLIC MINERAL MINING PERMIT NO. MP 01 2010
KENNECOTT EAGLE MINERALS COMPANY – HUMBOLDT MILL PROJECT
PART 632, 1994 P.A. 451**

A. Definitions

1. As used in this Mining Permit:
 - a. "Section 324.632XX" refers to a section of Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).
 - b. "Rule R 425.XXX" refers to a rule under the Michigan Administrative Code.
 - c. "DNRE" means the Department of Natural Resources and Environment.
 - d. "Humboldt Mill Project Site" means the lands and structures associated with mining activities at the Humboldt Mill.
 - e. "MDOT" means the Michigan Department of Transportation.
 - f. "MSHA" means the Federal Mining Safety and Health Administration.
 - g. "Person" means an individual, partnership, corporation, association, governmental entity, or other legal entity.
 - h. "Emergency Management Coordinator" means that term as defined in Section 2 of the Emergency Management Act, 1976 PA 390, MCL 30.402.

B. Authorizations

1. Beneficiation activities shall require a separate mining permit under one or both of the following conditions:
 - a. The site of the proposed beneficiation activities is not within or adjacent to the site of other associated mining activities, either existing or proposed, that are subject to a mining permit.
 - b. The operator of the proposed beneficiation activities is not the same person as the operator of other associated mining activities, either existing or proposed, that are subject to a mining permit.
2. The permittee shall not engage in the beneficiation of nonferrous metallic minerals, as defined in Rule R 425.102(1)(e), at the Humboldt Mill Project except as authorized by this Mining Permit.
3. This Mining Permit is not effective until all other permits required under the NREPA for the Humboldt Mill Project are obtained. The permittee shall comply with all other applicable permit standards under the NREPA.

4. This Mining Permit will remain in effect until terminated or revoked by the DNRE. The DNRE may terminate this Mining Permit under the conditions specified in Section 324.63207(2). The DNRE may revoke this Mining Permit under the conditions specified in Section 324.63207(3).
5. Compliance with the provisions of this Mining Permit or of Part 632 does not relieve the permittee of the obligation to comply with all other applicable tribal, state, federal, or local statutes, regulations, or ordinances.
6. This Mining Permit does not establish or convey property rights in either real estate or material.

C. Transfer or Amendment of Permit

1. The DNRE may transfer this Mining Permit to another person after public notice as follows:
 - a. The person acquiring this Mining Permit shall submit to the DNRE a request for transfer of this Mining Permit and shall provide the financial assurance required under Section 324.63211.
 - b. The person acquiring this Mining Permit shall accept the General Conditions and Special Conditions of this Mining Permit and shall comply with the requirements set forth in Part 632.
 - c. If the existing permittee is determined by the DNRE to be in violation of Part 632, or the rules promulgated thereunder, at the Humboldt Mill Project, then this Mining Permit will not be transferred until the existing permittee has completed the necessary corrective actions or the person acquiring this Mining Permit has entered into a written consent agreement with the DNRE to correct all of the violations.

Pending the transfer of this Mining Permit, the proposed transferee shall not operate the Humboldt Mill Project.

2. The DNRE shall not transfer this Mining Permit to another person if the DNRE has determined that person to be in violation of Part 632, rules promulgated thereunder, this Mining Permit, or an order of the DNRE under Part 632, unless the person has corrected the violation or the person has agreed in writing to correct the violation pursuant to a compliance schedule approved by the DNRE.
3. A request to transfer this Mining Permit to another person shall include the following:
 - a. An update of the contingency plan.
 - b. Provisions for financial assurance as prescribed in Rule R 425.301.
 - c. An organization report for the acquiring operator.

A transfer of this Mining Permit is not effective until all other applicable permits are transferred to the acquiring operator.

4. If the permittee conveys his or her authority to operate the Humboldt Mill Project to another person, and the DNRE has not approved a request for transfer of this Mining Permit, then, in addition to other enforcement actions, the DNRE may order the immediate suspension of any or all mining activities at the Humboldt Mill Project, including the removal or sale of metallic product.
5. This Mining Permit may be amended subject to the requirements of Section 324.63207(6) and Rule R 425.206. An application for amendment shall include revisions of any of the following that are affected by the changes:
 - a. The Environmental Impact Assessment.
 - b. The Mining, Reclamation, and Environmental Protection Plan.
 - c. The Contingency Plan.
 - d. Federal, state, and local permits and licenses that are anticipated to be required.
 - e. Provisions for financial assurance required under Rule R 425.301.
 - f. Other terms and conditions of this Mining Permit.

D. Financial Assurance

1. The permittee shall maintain financial assurance during milling operations until all reclamation has been completed and approved by the DNRE, and throughout the postclosure monitoring period, as prescribed under Section 324.63211 and Rule R 425.301; or until the DNRE releases financial assurance at such time as this Mining Permit may be terminated under Section 324.63207(2)(a). Failure to maintain financial assurance as required constitutes grounds for the DNRE to order immediate suspension of activities at the Humboldt Mill Project, pursuant to Section 324.63221.
2. The DNRE may provide a partial release of financial assurance for those portions of the site that are reclaimed and have met the criteria for release under Section 324.63211(2) and Rule R 425.301(2), based upon an update of financial assurance as described in Section 324.63211(2) and Rule R 425.308.

E. Beneficiation

1. The permittee shall post safety signs in conspicuous places around the site of any potential hazards to life or property.
2. The permittee shall install fencing, gates, or other measures to safeguard the public from unauthorized entry into the milling facility.

3. Tailings transport systems shall be designed to provide for emergency tailings conveyance or storage should a pipeline break, plug, freeze or require repairs and be made accessible for inspection, emergency repair, and maintenance. Location of emergency spill areas shall be designed to prevent contamination of surface water. If a power failure occurs, then tailing pipelines shall be self draining to the tailings area or to an emergency spill area or standby pumps and pipelines or standby power shall be provided. In some cases (such as a long pipeline over rough country), several spill areas may have to be provided.
4. The permittee shall submit all design certifications of liners, covers, and leachate collection systems to the DNRE and shall not begin placement of the ore, waste rock, overburden, or tailings in the storage facility until approved by the DNRE.
5. The permittee shall conduct reclamation activities at the Humboldt Mill Project in accordance with the mining, reclamation, and environmental protection plan submitted as part of the Mining Permit Application.
6. If beneficiation operations are suspended at the Humboldt Mill Project for a continuous period exceeding 90 days, the permittee shall take actions to maintain, monitor, and secure the mining area and shall conduct any interim sloping or stabilizing of surfaces necessary to protect the environment, natural resources, or public health and safety in accordance with this Mining Permit.
7. Unless the DNRE grants an extension, the permittee shall begin final reclamation of a mining area within three years of the date of cessation of milling operations at the Humboldt Mill Project and shall complete reclamation within the time set forth in the mining, reclamation, and environmental protection plan submitted as part of the Mining Permit Application.

F. Records, Reports, and Notifications

1. The permittee shall provide written notice to the DNRE Upper Peninsula district office of the date milling will commence at least 30 days prior to mining activities.
2. The permittee shall file with the DNRE Upper Peninsula district office a Mining and Reclamation Report on or before March 15 of each year, both during milling operations and post closure monitoring, as required by Section 324.63213 and Rule R 425.501. The report shall include a description of the status of mining and reclamation operations, an update of the contingency plan, monitoring results from preceding calendar year, tonnage totals of mined material, and amount of metallic product by weight. The report shall be filed in printed and electronic format. The permittee shall file a copy of the report with Humboldt Township.

3. The permittee shall provide a copy of the annual update of the contingency plan to the local emergency management coordinator at the time it is filed with the DNRE.
4. In addition to the annual update of the contingency plan filed with the mining and reclamation report, the permittee shall promptly provide an update of the contingency plan to the DNRE and local emergency management coordinator whenever there is a change of the notification process, change of local representatives of the permittee, substantial change in site conditions, or substantial change of equipment noted on the plan.
5. Records upon which the annual Mining and Reclamation Reports are based shall be preserved by the permittee for three years and made available to the DNRE upon request.
6. The permittee shall file with the DNRE Upper Peninsula district office an updated estimate of the cost of reclamation for mining activities for the current and succeeding two years of operation of the mill on or before March 15 of every third year after issuance of this Mining Permit, or as the DNRE determines to be necessary.
7. The permittee shall promptly notify the DNRE Upper Peninsula district office and each emergency management coordinator having jurisdiction over the affected area of any incident, act of nature, or exceedance of a Part 632 permit standard or condition at the Humboldt Mill Project that has created, or may create, a threat to the environment, natural resources, or public health and safety. The notification shall be made as soon as possible by telephone or in person to the DNRE Upper Peninsula district office during normal business hours or to the DNRE Pollution Emergency Alerting System between 5:00 p.m. and 8:00 a.m. and on weekends and holidays.
8. The permittee shall submit to the DNRE Upper Peninsula district office a detailed written incident report giving the particulars of the incident, act of nature, or exceedance of a Part 632 permit standard or condition within 10 days of discovery. If the response to the incident, act of nature, or exceedance is not concluded at the time this incidence report is filed as required, then the permittee shall submit to the DNRE Upper Peninsula district office a written final incident report within 30 days after the incident response is concluded. The permittee shall preserve records upon which incident reports are based for three years or until the end of the postclosure monitoring period, whichever is later.
9. If the permittee ceases all beneficiation activities for a period of 90 days or more, the permittee shall submit written notice to the DNRE Upper Peninsula district office of the date mining activities will resume at least 30 days before resumption of mining activities.

10. The permittee shall file an updated Organization Report, as defined in Rule R 425.103(c), within 30 days after any significant changes in the permittee's corporate organization.

G. Annual Nonferrous Metallic Mineral Surveillance Fee

1. The permittee shall pay the annual Nonferrous Metallic Mineral Surveillance Fee assessed by the DNRE pursuant to Section 324.63215, and any penalties that may be assessed if the fee is not paid when due.

H. Access by DNRE

1. Authorized representatives of the DNRE may enter at all reasonable times in or upon the Humboldt Mill Project Site for the purpose of inspecting and investigating conditions relating to the operation of the mill and associated facilities.

SPECIAL PERMIT CONDITIONS
NONFERROUS METALLIC MINERAL MINING PERMIT NO. MP 01 2010
KENNECOTT EAGLE MINERALS COMPANY – HUMBOLDT MILL PROJECT
PART 632, 1994 P.A. 451

A. General

1. The DNRE may modify or amend these Special Permit Conditions, or impose additional permit conditions, if necessary and as provided under Part 632, during milling operations.
2. The permittee shall immediately suspend relevant mining activities, and shall promptly notify the DNRE Upper Peninsula district office, in the event that any materials of possible archaeological, historic, or cultural value are unearthed by the beneficiation operations.
3. The permittee shall follow all applicable measures described in Section 2.5 of the Mining Permit Application to prevent damage to adjacent properties not owned by the permittee.

B. Other Permits and Requirements

1. The permittee shall construct and operate the Humboldt Mill Project in conformance with the following permits or approvals from the DNRE under the NREPA: Part 55 Michigan Air Use Permit, Part 31 National Pollutant Discharge Elimination System (NPDES), Part 301 Inland Lakes and Streams Permit, Part 31 Notice of Coverage for storm water management during construction activities, and Part 31 Notice of Intent for storm water management during operations.
2. The permittee shall file annual reports in compliance with the Federal Emergency Planning and Community Right to Know Act during operation of the Humboldt Mill Project.
3. The permittee shall prepare and implement a Spill Prevention Control and Countermeasures Plan (SPCC Plan) for the fuel storage area that conforms to 40 CFR 112. The SPCC Plan shall comply with the Part 5 rules promulgated pursuant to Part 31, Water Resources Protection, of the NREPA.
4. The SPCC Plan shall be reviewed and certified by a professional engineer, and maintained at the mill facility. The permittee shall design, operate, and maintain all tanks and secondary containment to contain a worst-case spill.
5. The permittee shall design, operate, and maintain all aboveground storage tanks containing flammable or combustible materials in compliance with the Michigan Fire Prevention Code, 1941 PA 207.

6. The permittee shall submit design plans for all aboveground storage tanks that will contain flammable or combustible materials to the DNRE for approval prior to installation. After the tanks are installed, the permittee shall not use the tanks until they are inspected and approved by a hazardous materials storage inspector of the DNRE.
7. The permittee shall prepare a Pollution Incident Prevention Plan (PIPP) to address potential spillage of fuel, salt, and other polluting materials in compliance with R 324.2001 through R 324.2009 at least 30 days prior to start up of the Wastewater Treatment Plant (WWTP) at the Humboldt Mill Project. Within 30 days after its completion, the permittee shall notify the DNRE and certify that the facility is in full compliance with R 324.2001 through R 324.2009, and shall notify the local emergency planning committee and the local health department. The permittee shall provide a copy of the PIPP to the DNRE at their request.
8. The permittee shall review the PIPP every three years or after any release that requires implementation of the plan, whichever comes first. The permittee shall update the plan when facility personnel, processes, or procedures identified in the plan change or as otherwise necessary to maintain compliance with R 324.2001 through R 324.2009. Upon preparation of an updated plan, the permittee shall notify the DNRE and recertify compliance with these rules.

C. Coverage

1. This Mining Permit governs the reuse of existing Humboldt Mill facilities, Humboldt tailings disposal facility (HTDF), (a/k/a Humboldt Pit), construction of new buildings and structures, and the operation, closure, post-closure monitoring, and reclamation.
2. The Humboldt Mill Project consists of two basic operations: Processing ore to form a concentrate for shipping to an off-site smelter, and disposal of tailings in the HTDF generated during processing.
3. The main milling facilities shall consist of a series of buildings with equipment for crushing, grinding, flotation, storing, and shipping of ore, and other ancillary operations as outlined in Section 3 and Figure 3-1 in the Mining Permit Application. In addition to the buildings and structures, the mill project includes recommissioning the existing HTDF to dispose of process tailings.
4. The Humboldt Mill Project will include the operation of the existing mill facilities and new facilities listed below:
 - ◆ Facility gate and fence;
 - ◆ Facility administration/communication systems;
 - ◆ Truck entrance gatehouse parking;
 - ◆ A coarse ore storage area (COSA);
 - ◆ Crushing and conveying system;
 - ◆ The existing HTDF;
 - ◆ A water treatment system with a new controlled outlet structure at the HTDF;

- ◆ Ore processing systems;
 - ◆ Site utilities;
 - ◆ Septic and sanitary systems;
 - ◆ Potable and non-potable water supply systems;
 - ◆ Mill reagent storage areas;
 - ◆ Surface water management structures;
 - ◆ Rail spur and building for concentrate load-out;
 - ◆ Tailings slurry pipeline;
 - ◆ All buildings and structures within the fenced facility boundary; and
 - ◆ Cut-off wall on the north side of the HTDF.
5. Unless approved by the DNRE pursuant to an amendment to the permit, the permittee shall conduct mining activities in accordance with the approved environmental protection plan, mining plan, containment plan, monitoring plan, contingency plan, reclamation plan, and post-closure monitoring plan submitted in the Mining Permit Application; and the tables, illustrations, figures, technical reports, calculations, and other data accompanying and supporting those documents; and the supplemental documents amending, clarifying, or revising the initial submittal of the Permit Application.

D. Mill Site Development

1. During initial construction of the milling facilities, the permittee shall utilize the following practices:
 - a. Any unmarketable timber removed from activities may be chipped and stockpiled on-site for use in landscaping and reclamation.
 - b. Roots and stumps that will be chipped or burned on-site, pursuant to a burning permit to be obtained from the DNRE.
 - c. Erosion control devices such as siltation fences shall be installed as detailed in KEMC's August 7, 2009, response to DNRE comments.
 - d. Topsoil shall be stripped from the area, stockpiled, and stabilized for use in landscaping and reclamation.
 - e. Topsoil and subsoil stockpiles will be surrounded by silt fencing or similar erosion control devices, and seeded with an MDOT, 2003 Standard Specification for Construction (MDOT, 2003) Temporary Seed Mixture 24+, as detailed in Section 3.2.15.1 of the Mining Permit Application.
2. The permittee shall maintain topsoil and other soil stockpiles by replacing or repairing silt fences as needed; maintaining other erosion control structures and measures; repairing eroded areas including regrading and revegetating; and cleaning ditches where silt and/or sand has accumulated.
3. Excess soil from the site development and on-site road construction shall be placed in berms to be used during reclamation, as detailed in Figure 3-1 of the Mining Permit Application.

4. The permittee shall construct and maintain all-weather gravel or paved roads for on-site access to the mill facilities. (Refer to Figure 3-1 of the Mining Permit Application for location of access roads.)
5. The permittee shall locate the fuel storage facility within a fenced and secured area.
6. The permittee shall minimize the potential for fuel spills and leaks through the following measures in a manner that is consistent with SPCC and PIPP requirements:
 - a. Training of personnel responsible for hauling fuel in proper procedures and emergency response.
 - b. Regular equipment inspections and documentation of findings.
 - c. Adequate secondary containment around all above ground tanks.
 - d. Staging of on-site emergency response equipment to quickly respond to unanticipated spills or leaks.
7. The permittee shall limit access to the mill facility to a single gated road, as detailed in Figure 3-1 of the Mining Permit Application.
8. The permittee shall construct and maintain a chain link fence surrounding the mill facilities, as detailed in Figure 3-1 of the Mining Permit Application.
9. The permittee shall maintain the perimeter fence and gates in a manner that preserves its intended purpose.
10. The permittee shall maintain all access roads and interior roads by minimizing mud tracking and removing mud as needed, and by promptly repairing ruts, potholes, or washouts, as weather permits.

E. Mining/Beneficiation Plan

1. The permittee shall advise the DNRE in advance any significant planned departure from the schedule for construction and operation activities proposed in the Mining Permit Application.
2. Coarse ore shall be stored in an enclosed building as detailed in Section 3.2.8 of the Mining Permit Application. The COSA shall have impervious containment sloping to collection sumps to collect contact water. Contact water shall be either used as facility process water or routed to the tailings discharge line.
3. The primary crusher shall be housed inside the COSA to reduce the potential of fugitive dust. In addition, the primary crusher discharged area shall be equipped with a "wet spray" system to suppress dust.
4. After ore trucks are unloaded they shall be washed prior to leaving the mill facilities as necessary.
5. Secondary crushing equipment shall be housed in an enclosed building and equipped with a bag-house for dust collection.

6. The transfer station between the secondary crusher and mill feed shall utilize a water spray bar for dust suppression.
7. Concentrate shall be conveyed from the milling facility to an enclosed building to be loaded in rail cars. The load out facility shall be equipped with drop doors on both ends of the building and closed during loading operations. In addition, the rail lines shall be constructed with an impermeable substrate of either concrete or bituminous material.
8. The permittee shall monitor the temperature and spray the concentrate piles with water to lower temperatures and reduce the potential for oxidation as necessary.
9. Rail cars shall be covered to reduce the potential for concentrate to escape to the environment during transport to an off-site smelter.
10. Excess concentrate shall be removed from the rail cars prior to exiting the concentrate load-out building.
11. All chemical reagents used for processing shall be stored in secure contained locations within the main mill plant as shown in Figure 3-17 of the Mining Permit Application.
12. Tailings shall be conveyed to the HTDF as slurry within a double-cased high density polyethylene (HDPE) pipe system, and the slurry pipeline shall be equipped with a leak detection system to monitor system breaches as described in Section 4.1.2.2 in the Mining Permit Application. The slurry pipeline shall be visually inspected once per shift as indicated in Table 5-6 in the Mining Permit Application.

F. Humboldt Tailings Disposal Facility (HTDF)

1. The DNRE shall determine the frequency and scope of operations and post-closure monitoring required in this condition based on the initial data collection period set forth in Special Permit Condition F-3. The permittee shall conduct ongoing characterization of the geochemistry and limnology of the HTDF throughout the milling operation and 20 years post closure to monitor the chemical and physical characteristics of the HTDF and to calibrate and adjust the model and predictions of dissolved metals and other related substances.
2. The permittee shall base the design of the Water Treatment Plant on a worst-case prediction of metal concentrations in the HTDF. This would include a prediction based on the long-term buildup of metals in the bottom waters without invoking the various chemical processes (e.g. oxidation-reduction, metal scavenging, particle settling) that are currently used in the HTDF Model to control metal concentrations. The permittee shall initially use these predictions to decide how long treatment of the HTDF water would likely be required.

3. The permittee shall confirm water quality and long-term stability of the water column in the HTDF by collecting the following information and submitting it to the DNRE Upper Peninsula district office:
 - a. Conduct monthly high resolution profiles of temperature, conductivity and dissolved oxygen (DO) and collect monthly water chemical samples at the following depths: -1 meter (m), -3m, -5m, -10m, -20m, -25m, -28m, -30m, -33m, -40m, -50m, and -60m.
 - b. Chemical samples shall include analysis of pH, conductivity, DO, total suspended solids, total dissolved solids, nutrients (NH₃-N, NO₂-N, NO₃-N, P), major ions (alkalinity, SO₄, Cl, F, Ca, Mg, Na, K), sigma H₂S, total and dissolved metals (32 element ICP-MS scan)
 - c. Properly adjust exact depths of the highest resolution section across the oxycline based on the results of high resolution temperature, conductivity, and dissolved oxygen profiles and sampling frequencies.
 - d. Implement special sampling protocol for anoxic bottom waters. This may include the collection of water samples using N₂ (nitrogen) pressure, filtering on site in a N₂-filled glove bag followed by immediate acidification.
 - e. The permittee shall, prior to tailings deposition, conduct a sediment trap study to assess the importance of metal scavenging in the HTDF. Three sediment traps are to be installed in the water column at -15m, -35m and -55m to determine the particulate flux to the floor of the HTDF. Sediment trap samples will be analyzed for total dry weight flux, total organic carbon, and total metals.
 - f. Monitor primary productivity (algae) in the upper part of the water column.
 - g. Collect high-resolution bottom and porewater data at closure of the HTDF.
 - h. Install a raft-mounted weather station to collect the following atmospheric forcing data: wind speed and direction, temperature, relative humidity, precipitation, and solar radiation. The permittee shall use these data and incorporate a hydrodynamic component to the HTDF model and allow for more precise assessments and sensitivity analysis of storm events, extreme wind forcing, and changes to water column structure.
4. The permittee shall utilize the HTDF for subaqueous tailings disposal. The surface elevation of tailings shall not exceed elevation 1420 feet mean sea level (MSL).
5. Prior to construction of the containment wall described in Section 4.1.2.1 in the Mining Permit Application and in KEMC's response to DEQ's February 25, 2009, letter, the permittee must submit the following to the DNRE:
 - a. Basis of design of the containment wall.
 - b. Predicted gradient changes in wells up gradient and down gradient of the containment wall.
6. Prior to conducting any milling operations the permittee must submit to the DNRE Upper Peninsula district office construction details of the containment wall. In addition, the permittee shall provide all data, information, and results identified in

Special Permit Condition F-9 to demonstrate that the performance of the containment wall shall meet the standards of Special Permit Condition F-10. The permittee must receive from the DNRE written approval of the construction details and written confirmation that the containment wall is in compliance with the standards set in Special Permit Condition F-10 before conducting any milling operations. The construction details shall include but not be limited to the following information:

- a. Detailed characterization of the containment wall area, including geology, hydrogeology, and water chemistry.
 - b. Laboratory and on-site/in-situ testing.
 - c. Rationale for spacing of injection boreholes.
 - d. Rationale for grout mixture.
7. The permittee shall develop annual bathymetry maps of the HTDF to accurately monitor tailings placement and calculate changes in HTDF water storage.
 8. The permittee shall monitor the flow of tailings slurry into the HTDF with a meter that reports total flow. The permittee shall keep a log of daily meter readings and computed daily flow in U.S. gallons per day, which shall be available for inspection by the DNRE upon request. The permittee shall report data to the DNRE Upper Peninsula district office quarterly.
 9. The permittee shall monitor the effectiveness and integrity of the containment wall in terms of hydraulic containment throughout the operating life of the WWTP by collecting the following information and data:
 - a. Continuously monitor water levels in wells identified in Special Permit Condition J-8, Wetland EE, and the HTDF and compare them to the predicted water levels identified in Special Permit Condition F-5(b).
 - b. Collect quarterly water quality samples from wells identified in Special Permit Condition J-8 and Wetland EE and compare to water quality in the HTDF to determine if there is a correlation between HTDF and up gradient groundwater chemistry and down gradient groundwater chemistry.
 - c. Update the water balance model quarterly to more accurately bracket seasonal variations and limit the uncertainty in the predicted groundwater levels in Special Permit Condition F-5(b). Model input data should include but not limited to the following:
 1. Changes in HTDF water storage.
 2. Monthly on-site precipitation rates.
 3. Monthly on-site evaporation and evapotranspiration rates.
 4. Tailings disposal rates.
 5. HTDF water discharge rates.
 6. HTDF watershed area.

The permittee shall report data, information, and results to the DNRE Upper Peninsula district office quarterly.

10. The permittee shall demonstrate the containment wall will minimize the actual and potential adverse impacts on groundwater and surface water in terms of hydraulic containment by complying with the following performance standards:
 - a. Confirm HTDF down gradient water levels behave as predicted based on the information submitted as required in Special Permit Condition F-5(b).
 - b. Confirm water quality in HTDF down gradient wells do not indicate a hydraulic connection with HTDF water and are in compliance with Rule R 425.406.
 - c. Confirm that the containment wall meets the requirement of a hydraulic conductivity of 1.0×10^{-7} centimeters per second (cm/s) as specified in Part 632 Rule R 425.409(a)(i)(B).
 - d. Confirm water balance calculations do not indicate an unpredicted reduction in HTDF water storage.
11. The permittee shall notify the DNRE Upper Peninsula district office immediately if any of the performance standards identified in Special Permit Condition F-10 are not in compliance, and shall take the following actions:
 - a. Implement increased monitoring as approved by the DNRE.
 - b. Conduct a source investigation and provide a report on the investigation to the DNRE.
 - c. Implement a plan for response activity as approved by the DNRE.
12. The permittee shall inspect the containment berm monthly and after major precipitation events to assess structural integrity. If structural defects are noted such as displacement, cracking, and erosional seeps, the permittee shall immediately implement stabilization procedures by adding fill to bolster the dike.
13. The permittee must receive written approval from the DNRE prior to removing the containment berm.

G. Water Management and Treatment

1. The permittee shall maintain ditches, culverts, spillways, and other water diversion or conveyance structures by cleaning sediment from ditches; cleaning debris from culverts; replacing rusted or damaged culverts; and repairing eroded areas and installing erosion control measures to remedy erosion as required under the Industrial Storm Water Permit.
2. The permittee shall submit a full set of WWTP engineering designs to the DNRE Upper Peninsula district office prior to construction of the WWTP. The permittee must receive written approval of the engineering designs from the DNRE before construction of the WWTP.

H. Waste and Hazardous Materials Management

1. The permittee shall characterize, transport, and dispose of materials not exempt from the definition of solid waste in accordance with federal and state solid and hazardous waste regulations. These materials shall be properly stored, labeled, and containerized prior to shipment and disposal or recycling.
2. Lubricants used for maintenance purposes shall be stored inside at the maintenance shop. All storage will be in accordance with the Federal SPCC Plan and/or the PIPP. Used oil and grease will be stored and recycled in accordance with Federal and DNRE used-oil regulations. Metal shavings will be properly contained in the shop area and shipped to a metals recycler for recycling and reuse.
3. The permittee shall install secondary containment areas for chemical reagents being stored. In addition, all off-loading areas of bulk chemicals shall have a sloped and curbed pad to direct and contain spills.
4. The permittee shall dispose of the dewatered microfiltration sludge from the WWTP at a licensed landfill.
5. The permittee shall characterize, transport, and dispose of materials not exempt from the definition of solid waste in accordance with federal and state solid and hazardous waste regulations. These materials shall be properly stored, labeled and containerized prior to shipment and disposal or recycling.

I. Soil erosion and Sediment Control

1. The permittee shall implement soil erosion and sediment control (SESC) measures that effectively reduce off-site soil erosion and sedimentation and control dust, as described in Section 3.2.15.1 of the Mining Permit Application and KEMC's August 7, 2009, response to DEQ comments.
2. The permittee shall utilize best management practices in constructing, operating, and maintaining all temporary and permanent SESC measures.
3. The permittee shall implement temporary SESC measures during construction, and shall maintain temporary SESC features on a daily basis.
4. The temporary SESC measures shall incorporate the following:
 - a. Materials and methods specified in the MDOT, 2003, where available, shall be used for specification of the materials to be used.
 - b. Permittee's staff shall be certified as storm water operators to complete the required inspections and coordinate repairs and maintenance during construction.
 - c. To the extent possible, clearing and grubbing shall be completed as a single continuous operation to minimize disturbance.
 - d. Silt fencing shall be placed downgradient before clearing and grubbing.

- e. Topsoil shall be stripped from the project area immediately after clearing and grubbing.
 - f. Topsoil and subsoil shall be stockpiled in a previously prepared area. Any excess subsoil shall be segregated from the topsoil and stockpiled separately. Stockpiles shall have maximum slopes of three-to-one, and shall be surrounded by additional silt fence.
 - g. As soon as possible after establishment, stockpiles shall be prepared and seeded with a mixture adapted for sandy soil as specified in the MDOT, 2003. Seed mixtures shall include temporary species such as oats or perennial rye, and perennial native species.
5. The permittee shall establish permanent SESC measures as soon as possible after grading and stockpiling has been completed, and shall maintain the permanent measures for the life of the Humboldt Mill Project.
 6. The permittee shall maintain the storm water conveyance and storage basins as designed and constructed as required under the Storm Water Pollution Plan in the Industrial Storm Water Permit. The permittee shall conduct inspections promptly after precipitation or snow melt events. The permittee shall repair areas that exhibit erosion as soon as practical by filling with topsoil and seeding with the appropriate mix as specified above.

J. Monitoring

1. The permittee shall maintain groundwater monitoring wells by marking the wells with flags to prevent damage during other maintenance; installing protector pipes; and repairing or replacing broken protector pipes, surface seals, and locks.
2. At such time as monitor wells are to be abandoned, the permittee shall abandon the wells in accordance with DNRE requirements.
3. The permittee shall construct, utilize, maintain, operate, and abandon, as applicable, a comprehensive monitoring well network as identified in Figure 5-1 of the Mining Permit Application, and in Special Permit Condition J-7 and in compliance with Rule R 425.406.
4. The permittee shall construct cluster wells at the proposed leachate locations MW-701 and MW-702, identified on Figure 5-1 of the Mining Permit Application to monitor the quaternary unconsolidated formation and upper fractured bedrock zone.
5. The permittee shall construct cluster wells at the proposed compliance locations MW-703 and MW-704, identified on Figure 5-1 of the Mining Permit Application to monitor the quaternary unconsolidated formation, upper fractured bedrock zone, lower levels of the bedrock aquitard zone, and deeper bedrock aquiclude zone.
6. The permittee shall convert well HW-1U to include the upper fractured bedrock zone and lower levels of the bedrock aquitard zone.

7. The permittee shall construct a well down gradient of the key-in point at the east end of the containment wall to monitor static water levels and water quality in the quaternary unconsolidated formation and upper fractured bedrock zone.
8. The permittee shall monitor, for compliance purposes, groundwater and wetland water elevations throughout the life of HTDF operations, and shall report the data to the DNRE Upper Peninsula district office quarterly, for the following wells and wetland:
 - a. Daily measurements shall be taken by transducers placed in wells MW-701, MW-702, MW-703, MW-704, HYG-1, HW-2, HW-1U, HW-1L, HW-8U, and wells identified in Special Condition J-7.
 - b. Continuous measurements shall be taken by a transducer placed in Wetland EE.
9. The permittee shall collect quarterly water quality samples from wells identified in Special Condition J-8. The permittee shall sample and analyze the water for parameters listed in Table 5-2 in the Mining Permit Application.
10. The permittee shall collect quarterly surface water quality samples from locations identified on Figure 5-2 and described in Special Permit Condition J-14 and analyzed for parameters listed in Table 5-3 in the Mining Permit Application.
11. The permittee shall submit a plan to the DNRE Upper Peninsula district office to install additional monitoring wells as close as physically practicable but not more than 150 feet from the milling facilities to adequately identify potential contamination movement from the mill. The new wells will be incorporated into the compliance monitoring well network. The permittee must receive written approval of the plan from the DNRE before conducting any milling operations. The permittee shall sample wells quarterly and analyze the water for parameters listed in Table 5-2 in the Mining Permit Application.
12. The permittee shall conduct regional hydrologic monitoring to evaluate local and regional stream flow and quality, and local and regional groundwater elevations in accordance with the requirements of Rule R 425.203(g) and Rule R 425.406.
13. The permittee shall monitor the flow of water from the WWTP with a meter that reports total flow. The permittee shall keep a log of daily meter readings and computed daily flow in U.S. gallons per day, which shall be available for inspection by the DNRE upon request. The permittee shall report data to the DNRE Upper Peninsula district office quarterly.
14. The permittee shall submit a plan to the DNRE Upper Peninsula district office to monitor surface water/sediment, aquatic biota, and fish tissue. The permittee must receive written approval of the plan from the DNRE before conducting any milling operations. The plan should incorporate the following information:

- a. Surface Water Quality Control Sites: Since regional influences may cause either chronic or acute impacts to water quality, a long-term control data set is needed to help explain consequences of ore milling operations versus natural occurrences. Therefore, the permittee shall add surface water quality stations outside the influence of the Kennecott Humboldt Mill site to serve as controls to the stations already being monitored as part of an approved long-term monitoring plan.
- b. Reporting of Water Quality Results: In addition to annual summary reports for groundwater and surface water quality monitoring, a brief report shall be provided to the DNRE within 30 days in the event that any stations with unusual outlier data points or other issues of concern are identified.
- c. Measurement of flow should be reported during ambient water sampling events. Ambient water samples should not be taken from water bodies that are either at or below the 95 percent exceedance flow or stagnant as the data generated give erroneous results; such events should be reported as not applicable due to lack of flow.
- d. Analytical methods used for ambient water samples shall include the following United States Environmental Protection Agency (USEPA) trace metals/elements methods:
 - 1. USEPA. 2001. Method 1631C: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry. EPA 821/R-01/024.
 - 2. USEPA. 1996a. Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels. EPA 821/R-96/011.
 - 3. USEPA. 1996b. Method 1638: Determination of Trace Elements in Ambient Waters by Inductively Coupled Plasma-Mass Spectrometry. EPA 821/R-96/005.
- e. Sediment analytical results from selected monitoring stations (both baseline monitoring and control sites) shall be compared to the Consensus-Based Probable Effect Concentrations found in MacDonald et al., 2000. (MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39, 20-31).
- f. Aquatic Biota Sampling: The permittee shall continue to monitor and assess the fisheries, aquatic macroinvertebrate communities, and aquatic habitat at currently selected baseline monitoring locations and at acceptable control sites. A long-term aquatic sampling plan including a description of proposed control sites, sampling methods, and a standardized monitoring schedule should be submitted for approval.
- g. Fish Tissue Sampling: The permittee shall continue to monitor and assess selenium and mercury concentrations in fish muscle tissue at currently selected baseline monitoring locations and acceptable control sites. A description of proposed control sites, sampling methods, and a

monitoring schedule should be provided. In addition, fish liver samples from control and potentially impacted sites should be analyzed for selected metals.

15. The current ambient monitoring stations selected by the permittee should be revisited on a periodic basis over the life of the discharge. To reduce the effects of seasonal variability, ambient monitoring should be conducted in the same season throughout the life of the facility operations.
16. The permittee shall utilize results of the fish, aquatic macroinvertebrates, and aquatic habitat surveys in conjunction with water quality monitoring results, as applicable, to determine compliance with Part 632. The permittee shall notify the DNRE Upper Peninsula district office and shall institute an increased monitoring program or implement response activity, as described in Rule R 425.406 of the rules promulgated under Part 632 and as approved by the DNRE, at such time results indicate an actual or potential impact from milling operations.
17. The permittee shall monitor groundwater elevations and quality for 20 years post-closure in wells identified in Special Permit Conditions J-8 and J-11.
18. Post-closure monitoring shall include the following:
 - a. Monitoring of groundwater and surface water quality.
 - b. Monitoring of flora and fauna for five years.
 - c. Monitoring of fisheries and aquatic macroinvertebrates for ten years.
 - d. Monitoring and maintenance of the reclaimed areas.
19. The permittee shall conduct regular inspections of impermeable surfaces as described in their Impermeable Surface Inspection and Surface Repair Plan.
20. The permittee shall operate, monitor, and maintain the WWTP to assure the treated effluent meets the effluent standards set in the NPDES permit.
21. The permittee shall monitor wastewater effluent continuously for indicator parameters to verify proper operation. Effluent not meeting treatment requirements shall be pumped back to the HTDF for re-treatment.
22. The permittee shall conduct ongoing characterization of the geochemistry of the tailings throughout the milling operation to be used in calibrating and adjusting the model and predictions of potential generation of acid, dissolved metals, and other related substances.
23. The permittee shall monitor concentrate for oxidation in the load-out facility.
24. In addition to monitoring described elsewhere in this permit, the permittee shall conduct monitoring required under the NPDES permit, air permit, and storm water

construction and industrial storm water permits, and Part 301, Inland Lakes and Streams, permit.

K. Contingencies

1. As a contingency measure, the permittee shall leave the WWTP and associated infrastructure in place for five years after tailings disposal has ceased, as described in Section 7.1.1.2 of the Mining Permit Application. If monitoring indicates there are elevated metals in the HTDF that could impact surface water, the permittee shall implement one or both of the following treatment options:
 - a. Continue the treatment of the HTDF water through the WWTP until water quality conditions in the HTDF meet surface water standards; and/or
 - b. Amend the HTDF water with appropriate reagents to reduce elevated metal parameters in order to meet surface water standards.
2. The permittee shall update the financial assurance to account for added costs if Special Permit Condition K-1 is necessary.
3. The permittee shall maintain sufficient reserve electrical power to keep all necessary pumps and treatment systems operational in the event of a power malfunction.
4. The permittee shall provide a fire water system for fire protection during construction, operations, and decommission.
5. The permittee shall implement contingency measures to mitigate a fuel spill as specified in the SPCC and/or PIPP. The permittee shall perform fuel tank integrity testing at regular frequencies to verify that the storage tanks are not leaking.
6. The permittee shall assure that operators are trained to respond to potential releases of fuel from leaking hoses or valves, mobile storage tank failure, mishandling of fuels, or related accidents. The permittee shall provide adequate on-site spill response equipment.
7. Absorptive materials may be used initially to contain a potential spill. After the initial response, soil impacted with residual fuel shall be addressed. Remedial efforts shall include the removal of impacted soil to preclude migration of fuel to groundwater or surface water. The project's SPCC and/or PIPP plan shall address fueling operations, fuel spill prevention measures, inspections, training, security, spill reporting, and equipment needs. All responses to a fuel spill, both large and small, shall follow the guidelines dictated by the spill response plan. The tanks shall be inspected regularly, and records of spills shall be kept and reported to the DNRE and other agencies as required.
8. In the event of a massive fuel tank failure, the permittee shall pump fuel released into the secondary containment into portable tanks, and shall take such additional remedial action as may be required by the DNRE.

9. The permittee shall provide for required safety equipment, personnel training, and standard operating procedures to respond to potential fires.
10. The permittee shall provide for a water truck to be stationed on-site during construction and operation of milling facilities, and for all construction equipment to be equipped with fire extinguishers.
11. During the operation of milling facilities, the permittee shall provide for fire extinguishers and standby water pipelines to be located in high risk areas, and shall train personnel in their use.
12. The permittee shall utilize an Incident Command System (ICS) structure to respond to emergencies. An emergency is defined as any unusual event or circumstance that endangers life, health, property, or the environment. The ICS shall provide for the following designated individuals to take immediate responsibility and control of the situation and ensures appropriate public authorities, safety agencies, and the general public are notified:
 - a. Incident Commander (IC). The general manager at the facility will be designated the IC and will be responsible to ensure that emergency response actions are carried out in an appropriate and timely manner. The IC will ensure that appropriate resources are available, ensure the incident is secured, and release resources in an orderly manner. The IC will also ensure appropriate notification is made to all required regulatory agencies and necessary emergency response agencies.
 - b. Safety Officer. The facility safety officer and staff are responsible for ongoing review of ICS structures and will monitor activities in response to any emergencies. During an emergency, the safety officer will manage special situations that expose responders to hazards, coordinate emergency response personnel, mine rescue teams, fire response, and ensure relevant emergency equipment is available for emergency service. This individual will also work with the IC to ensure appropriate personnel are made available to respond to the situation.
 - c. Environmental Officer. The facility environmental officer will be responsible for managing any environmental aspects of an emergency situation. This individual will coordinate with the IC to ensure environmental impact is minimized, determine the type of response that is needed, and act as a liaison between environmental agencies and milling site personnel.
 - d. Public Relations Officer. The facility public relations officer will be responsible for managing all contacts with the public and will coordinate with the IC and the safety and environmental officers.
13. The permittee shall handle evacuation of the general public, if necessary, in conjunction with emergency response agencies. The public relations officer will be responsible for notifying emergency response agencies and coordinating with other site personnel.

14. The permittee shall provide and maintain emergency equipment including, but not limited to, the following:
 - a. ABC rechargeable fire extinguishers.
 - b. Radios.
 - c. First aid kits, stretchers, backboards, and appropriate medical supplies.
 - d. Spill kits (hydrocarbon and chemical).
 - e. Water truck and fire hoses.
 - f. HAZMAT response equipment.
15. Fire extinguishers shall be located at appropriate locations throughout the facility, in accordance with MSHA requirements. Other emergency response equipment shall be located at appropriate and convenient locations for easy access for response personnel.
16. As part of the contingency plan, the permittee shall maintain a current list of the following emergency telephone numbers as required by Rule R 425.205(1)(c):
 - a. Representatives of the permittee.
 - b. The emergency management coordinator.
 - c. Local ambulance services.
 - d. Local hospitals.
 - e. Local fire and police departments.
 - f. The district office of the DNRE.
 - g. The DNRE Pollution Emergency Alerting System.
 - h. Federal regulatory agencies as appropriate.
 - i. The Marquette County Health Department.
 - j. The Humboldt Township supervisor.
17. The permittee shall provide appropriate and adequate training programs on emergency response procedures for employees responsible for responding to emergencies. These individuals shall include the incident commander, safety officer, environmental officer, public relations officer, and other individuals designated to respond to emergencies.
18. At least once each year, the permittee shall conduct a mock field exercise of the Contingency Plan. Test situations shall consist of emergencies that could be encountered at the mill operation, such as a release of a hazardous substance, fire, or a natural disaster. The permittee shall evaluate the response exercise after completion to determine the effectiveness of the Contingency Plan. The permittee shall involve local emergency response officials as appropriate. The permittee shall implement any changes or improvements found to be necessary, and incorporate them into a revision of the facility Contingency Plan.
19. The permittee shall notify the DNRE as soon as practical after identifying a leak in the tailings transport system. Slurry pumps shall be shut-down until the source of the breach is identified and repaired.

L. Groundwater and Surface Water Sampling Procedures

1. The collection of groundwater and surface water samples shall be completed in accordance with the Humboldt Mill Project Quality Assurance Project Plan and Standard Operating Procedures, as described in Section 5.4 of the Mining Permit Application. These quality control documents have been previously provided to the DNRE and describe the following in accordance with Rule R 425.203:
 - a. Surface water sampling procedures.
 - b. Groundwater sampling procedures including well purging procedures.
 - c. Procedures to prevent cross contamination of samples.
 - d. Quality assurance and quality control program including the use of field blanks and duplicates.
 - e. Procedures for the collection of groundwater and surface water field data.
 - f. Sample preservation, documentation, and chain-of-custody procedures.
 - g. Data validation procedures.
 - h. Well installation development and abandonment procedures.

2. The permittee shall statistically assess groundwater and surface water quality data during operations for distributional changes as a result of mining activities, as described in Section 5.4 of the Mining Permit Application. Statistical methods will include testing for trends in water chemistry, and comparing constituent concentration levels to those observed in background or upgradient locations. Appropriate parametric or nonparametric statistical methods shall be utilized in consideration of the observed data characteristics, i.e., the distributional form of the data and the amount of data points below the detection level. In addition, sources of variation in the data unrelated to site activities, such as seasonality, shall be statistically estimated and controlled. Relevant documents containing guidance for selecting appropriate statistical tests are:
 - a. Department of Environmental Quality, 2002. Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
 - b. Gilbert, R. O., 1987. Statistical Methods for Environmental Pollution Monitoring, Van Nostrand Reinhold, New York.
 - c. USEPA, 2000. Practical Methods for Data Analysis—EPA QA/G-9, EPA/600/R-96/084.
 - d. USEPA, 1992. Statistical Analysis for Groundwater Monitoring Data at RCRA Facilities – Addendum to Interim Final Guidance, PB89-151047.

3. The permittee shall provide to the DNRE Upper Peninsula district office quarterly and annual summary reports of monitoring data and analyses completed. The permittee shall maintain all related monitoring data in a database including well borehole logs and construction records.

M. Financial Assurance

1. This Mining Permit is not effective until the permittee establishes financial assurance in the amount of \$5,200,000. This value is based on reclamation and monitoring cost estimates, including additional commitments that were made by the permittee in their response to the DEQ's February 25, 2009, letter. The following are specific revisions in the reclamation plan which resulted in an increase in the financial assurance cost estimates:
 - a. The reclamation cost estimate for the site was revised to reflect demolition and removal of all structures, associated grading, revegetation, removal of rail lines, roads, paved areas, and utilities in year 16.
 - b. The post-closure monitoring cost estimate was revised to include the cost of properly abandoning all monitoring wells and associated labor.
2. The permittee shall periodically update the amount of financial assurance in accordance with the requirements of Rule R 425.301.

N. Reclamation Plan

1. The permittee shall reclaim the Humboldt Mill Project Site at the conclusion of ore processing to establish a self-sustaining ecosystem in conformance to Rule R 425.204 and Rule R 425.407. The final land use of the site will be compatible with existing uses on adjacent properties.
2. The permittee shall, to the extent feasible, conduct reclamation activities concurrently with the milling operation, and in any event shall initiate reclamation activities at the earliest possible time after cessation of mining activities in any portion of the mining area. Reclamation activities shall commence during initial construction activities and shall continue through facility closure and the post-closure care period.
3. Buildings shall be demolished after salvageable materials have been removed unless the permittee enters into an agreement with another party in which a property end use is established that includes beneficial use of any building(s). Concrete foundations and floor slabs shall be removed for all buildings that are demolished. Demolition debris shall be removed from the site and disposed at an approved off-site disposal facility. All regulated materials, if any, shall be disposed in a manner consistent with state and federal regulations.
4. After removal of all debris the building areas shall be graded to eliminate ponding and to promote surface water drainage.
5. Rail lines and paved areas shall be removed at the time the buildings are removed unless the permittee enters into an agreement with another party in which a property end use is established that includes beneficial use of rail lines, paved areas, and/or utilities.
6. Culverts shall be removed and ditches regraded to conform to the reclamation grading plan. After hard structures are removed the areas shall be regraded and vegetated.

7. Reclamation of the sanitary systems shall include removal of septic holding tanks, pipes and valves, including all pipes in the drain field. Most of the sanitary components will not be salvageable and will be managed in accordance with applicable regulations. The disturbed areas shall then be regraded consistent with the reclamation grading plan and revegetated.
8. Reclamation of the potable water system shall include removal of pressure tanks, piping, and treatment systems and piping. The potable well(s) shall be abandoned in accordance with R 325.1662, R 325.1663, and R 325.1664 of Part 127, the Michigan Water Well Construction and Pump Installation Code, of the Public Health Code, 1978 PA 368, as amended, and rules.
9. The water treatment system shall be removed and utilities when it is no longer needed to implement Special Permit Condition K-1.
10. The permittee shall complete final site grading as shown on Figure 6-1, in KEMC's response to DEQ comments dated February 25, 2009, on the Mining Permit Application.
11. Revegetation shall include species indigenous to the area, promoting a self-sustaining plant community. Native grass planting shall follow the procedures outlined in the Natural Resources Conservation Service, Native Grass Planting Conservation Reserve Enhancement Program, CREP-CP2. Figure 6-1, in KEMC's response to DEQ comments dated February 25, 2009, on the Mining Permit Application shows approximate area of revegetation at final reclamation. Fertilizer shall be applied at an appropriate rate based on topsoil nutrient testing.
12. Erosion control methods described for construction shall be utilized during reclamation. During reclamation, erosion control practices shall include:
 - a. Applying mulch to all ground cover areas.
 - b. Installing silt fence.
 - c. Installing erosion control fabric on slopes steeper than eight percent.
 - d. Installing rock filled gabions in drainage ditches.
 - e. Using sized riprap in ditches to reduce water velocity.
13. During reclamation, temporary silt control basins shall be constructed to contain surface water runoff. These structures shall be strategically placed during final site grading to better control surface water runoff during site reclamation activities. Exposed areas being reclaimed will be kept wet as necessary to control fugitive dust. After completion of site grading the temporary basins shall be filled in and restored to the surrounding topography.
14. At such time as monitor wells are to be abandoned, the permittee shall abandon the wells in accordance with applicable DEQ requirements.

ATTACHMENT 1
NONFERROUS METALLIC MINERAL MINING PERMIT
Part 632, Nonferrous Metallic Mineral Mining, 1994 PA 451
Permit Number: MP 01 2010

SUPPLEMENTAL DOCUMENTS AMENDING, CLARIFYING, OR REVISING THE INITIAL
SUBMITTAL OF THE PERMIT APPLICATION

April 24, 2009, letter from Vicky Peacey, Kennecott Eagle Minerals Company (KEMC) to Harold Fitch, Director, Office of Geological Survey (OGS) – KEMC, Humboldt Mill Part 632 Permit Application, Response to Department of Environmental Quality (DEQ) Comments dated February 25, 2009. (Answers to groundwater questions for B.13 and G.1 through G.11).

May 12, 2009, letter from Vicky Peacey, KEMC, to Joe Maki, DNRE Upper Peninsula District Office – Request for Clarification/Additional Information on Humboldt Mill Part 632 Permit Application, KEMC. (A CD copy of the electronic database information was attached).

May 29, 2009, letter from Jonathon C. Cherry, KEMC, to Joe Maki, DNRE Upper Peninsula District Office – Humboldt Mill Mining Permit Application Response to Comments of February 25, 2009, from the OGS.

June 8, 2009, letter from Jonathon C. Cherry and Vicky Peacey, KEMC, to Joe Maki, DNRE Upper Peninsula District Office – Humboldt Mill Mining Permit Application, Completion of Response to Comments of February 25, 2009, OGS. (Addresses Comments H12, H13 and N1).

June 17, 2009, e-mail from Vicky Peacey, KEMC, to Joe Maki and Melanie Humphrey, DNRE Upper Peninsula District Office – Additional Information Regarding Humboldt Tailings Disposal Facility (HTDF) Modeling. (Submitted formulas/equations that were used to calculate their responses).

July 15, 2009, letter from Vicky Peacey, KEMC, to Joe Maki, DNRE Upper Peninsula District Office – Humboldt Mill Part 632 Permit Application Response to Lorax Comments.

August 7, 2009, letter from Vicky Peacey, KEMC, to Lindsey Ringuette, Water Bureau, DNRE Upper Peninsula District Office – Humboldt Mill Permit Application Response to DEQ Comments per July 14, 2009, Communication. (Addresses Comments A3 and C4).

September 4, 2009, letter from Vicky Peacey, KEMC, to Joe Maki, DNRE Upper Peninsula District Office – Air Deposition Analysis Supporting the Humboldt Mill Mining Permit Application Response to Comments from DEQ.

September 22, 2009, letter from Vicky Peacey, KEMC, to Joe Maki, DNRE Upper Peninsula District Office – Air Deposition Analysis Supporting the Humboldt Mill Mining Permit Application Response to Comments from DEQ – Revised Pages of the September 4, 2009, Submittal.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

December 1, 2011

Ms. Kristen Mariuzza
Kennecott Eagle Minerals Company
504 Spruce Street
Ishpeming, Michigan 49849

Dear Ms. Mariuzza:

The Department of Environmental Quality (DEQ), Resource Management Division (RMD), Office of Oil, Gas and Minerals (OOGM), received a request dated September 30, 2011, from Kennecott Eagle Minerals Company (KEMC) to amend the Humboldt Mill Mining Permit MP 01 2010. The modification consists of relocating the substation. In accordance with the requirements of Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), Section 63207(6), the DEQ reviewed the request and determined that the amendment does not constitute a significant change from the conditions of the approved mining permit. The DEQ has provided written notice to pertinent parties and has published notice in *The Mining Journal*.

As prescribed under Part 632, Section 63207(6) of the NREPA, the DEQ is hereby notifying KEMC that it has approved the amendment. The modifications are now incorporated as part of Mining Permit MP 01 2010.

If you have additional questions, please contact Mr. Joe Maki at 906-346-8563; makij3@michigan.gov; or DEQ, RMD, OOGM, Upper Peninsula District Office, 420 5th Street, Gwinn, Michigan 49841; or you may contact me.

Sincerely,

Harold R. Fitch
Assistant Supervisor of Wells
and Chief
Office of Oil, Gas, and Minerals
Resource Management Division
517-241-1548

cc: Mr. Jim Sygo, Deputy Director, DEQ
Ms. Liane J. Shekter Smith, P.E., DEQ
Mr. Joe Maki, DEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

July 26, 2012

Ms. Kristen Mariuzza
Kennecott Eagle Minerals Company
504 Spruce Street
Ishpeming, Michigan 49849

Dear Ms. Mariuzza:

The Department of Environmental Quality (DEQ), Office of Oil, Gas and Minerals (OOGM), received a request dated May 17, 2012, from Kennecott Eagle Minerals Company (KEMC) to amend the Humboldt Mill Mining Permit MP 01 2010. The modification consists of relocating employee parking; the water treatment plant; and the guardhouse. The amendment also includes the addition of an electrical building and an administrative office building. In accordance with the requirements of Section 63207(6), of Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), the DEQ reviewed the request and determined that the amendment does not constitute a significant change from the conditions of the approved mining permit. The DEQ has provided written notice to pertinent parties and has published notice in *The Mining Journal*.

As prescribed under Section 63207(6), of Part 632 of the NREPA, the DEQ is notifying KEMC that it is hereby approving the amendment. The modifications are now included as part of Mining Permit MP 01 2010.

If you have additional questions, please contact Mr. Joe Maki, OOGM, Resource Management Division, at 906-346-8563; makij3@michigan.gov; or DEQ, Upper Peninsula District Office, 420 5th Street, Gwinn, Michigan 49841; or you may contact me.

Sincerely,

Harold R. Fitch, Chief
Office of Oil, Gas and Minerals
Resource Management Division
517-241-1548

cc: Mr. Jim Sygo, Deputy Director, DEQ
Mr. Joe Maki, DEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



C. HEIDI GREYER
DIRECTOR

October 16, 2018

VIA E-MAIL

Ms. Jennifer Nutini, P.E.
Eagle Mine, LLC
4547 County Road 601
Champion, Michigan 49814

Dear Ms. Nutini:

**SUBJECT: Humboldt Mill Mining Permit Application Amendment Request Final
Decision - MP 01 2010**

The Department of Environmental Quality (DEQ) has made a final decision to approve Eagle Mine, LLC's (Eagle) request to amend Mining Permit MP 01 2010 to allow for additional tailings from the Eagle and Eagle East ore to be deposited for final disposal in the Humboldt Tailings Disposal Facility (HTDF) located in Humboldt Township, Marquette County. The DEQ has determined that the amendment request meets the requirements of the law and the mining operation will not pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources, in accordance with Part 17, Michigan Environmental Protection Act, of the NREPA.

In accordance with Rule 425.201(5) of Part 632, the department may impose terms and conditions in a mining permit, in addition to those specified in the application, that are necessary to implement the rules and statute. In making this determination, the following amended permit conditions are hereby in effect as of the date of this letter:

- Amended Special Permit Condition F1: The permittee shall conduct ongoing characterization of the geochemistry and limnology of the HTDF throughout the milling operations, closure, and 20 years post closure to monitor the chemical and physical characteristics of the HTDF and to calibrate and adjust the model and predictions of dissolved metals and other related substances. During operations and closure, the permittee shall update predictions of how long treatment of the HTDF water would likely be required for water quality conditions to meet surface water standards after tailings disposal has ceased. Results of this monitoring shall be reported in the Annual Mining and Reclamation Report, and financial assurance estimates shall be evaluated annually, and updated as necessary to account for any added cost of water treatment during closure.

Ms. Jennifer Nutini, P.E.

Page 2

October 16, 2018

- Amended Special Permit Condition F4: This permit only authorizes utilization of the HTDF for subaqueous disposal of tailings from Eagle and Eagle East ore. The surface elevation of tailings shall not exceed 1515 feet mean sea level (MSL).
- Amended Special Permit Condition F13: The permittee shall submit a detailed plan for final reclamation of the HTDF and must receive written approval from the DEQ prior to proceeding with final reclamation of the HTDF.
- Amended Special Permit Condition N9: The water treatment system and associated utilities shall be removed once it is demonstrated that water treatment will no longer be necessary to meet surface water quality discharge standards. Post closure monitoring of the HTDF shall begin once the approved reclamation of the HTDF is complete.

Thank you for your attention and consideration in this regard. If you have any questions, please feel free to contact Ms. Melanie Humphrey, Area Geologist, Oil, Gas, and Minerals Division at 906-250-7564; humphreym@michigan.gov; or you may contact me.

Sincerely,



Harold R. Fitch, Director
Oil, Gas, and Minerals Division
517-284-6823

cc: Mr. Adam Wygant, DEQ
Mr. Rick Henderson, DEQ
Ms. Melanie Humphrey, DEQ
File: Humboldt Mill – OGMD files



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
MARQUETTE DISTRICT OFFICE



PHILLIP D. ROOS
DIRECTOR

June 17, 2024

VIA EMAIL

Jennifer Nutini, Environmental Superintendent
Eagle Mine LLC
4547 County Road 601
Champion, Michigan 49814

Dear Jennifer Nutini:

Subject: Humboldt Mill Minig Permit Amendment Approval, MP 01 2010

The Department of Environment, Great Lakes, and Energy (EGLE), Oil, Gas and Minerals Division (OGMD), has completed review of Eagle Mine LLC's (Eagle) amendment request dated May 7, 2024, for additional processing of tailings producing a pyrrhotite concentrate. This letter serves as notification that EGLE has determined that the request to amend the mine plan does not constitute a significant change from the conditions of the approved mining permit, MP 01 2010, issued under Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), and promulgated rules (Part 632). EGLE has provided enclosed written notice of this determination to Humboldt Township, Michigamme Township, Powell Township, Marquette County, and federally recognized tribes.

EGLE has published notice of this determination in The Mining Journal on June 15, 2024. As stipulated in Section 63207(6) of Part 632, EGLE shall approve the amendment request within 14 days after publication of notice. Therefore, this letter also serves as notification of approval of the amendment request is in effect June 29, 2024.

The following items provide clarification of the requirements and mining permit conditions applicable to new mining activities approved in the amendment request:

1. Special Permit Conditions (SPC) E7,8,9,10 of Mining Permit MP 01 2010 shall apply to the pyrrhotite concentrate transported and stored within the mining area. Eagle shall notify OGMD if concentrate will be transported off-site by means other than rail. If not dewatered as a product to be transported off-site, pyrrhotite concentrate shall be conveyed and disposed of in the HTDF as proposed in the amendment request and in accordance with SPC E12.
2. Desulfurized/dewatered tailings shall be temporarily stored in the tailings dewatering and load-out facility or transported to the HTDF for subaqueous disposal in accordance with General Permit Condition E3, SPC E12, and SPC K19.

3. Only tailings from the pyrrhotite removal process shall be transported to, and dewatered and temporarily stored in, the tailings dewatering and load-out facility.
4. Storage of tailings falls under the definition of a mining activity. Therefore, compliance monitoring well KMW-5R shall be used to meet the requirements of R425.406 (b) of Part 632 promulgated rules for groundwater monitoring.
5. Contact water from the tailings dewatering and load-out facility shall be managed as proposed in the amendment request and in accordance with SPC E2.
6. New areas where mining activities will occur, including the tailings dewatering and load-out facility, shall be reclaimed in accordance with the approved reclamation plan and conditions of Section N of MP 01 2010.
7. Financial assurance cost estimates shall be updated as required by R425.308 of Part 632 promulgated rules to include reclamation of areas where new mining activities will occur.
8. Chemical reagents used for processing shall be stored in secure locations with secondary containment as required by SPC E11 and H3. Eagle shall review the Pollution Incident Prevention Plan for Humboldt Mill for compliance with Part 5 administrative rules pursuant to Part 31 of NREPA and shall notify EGLE of any necessary updates to the plan and provide recertification per SPC B8.
9. Dewatered tailings shall not be transported to Eagle Mine unless approved through an amendment of Mining Permit MP 01 2007.
10. Approval of this amendment request does not relieve Eagle of other EGLE permitting requirements and approvals.

Thank you for your attention in this regard. Please direct any questions to Melanie Humphrey, OGMD Mining Specialist, email humphreym@michigan.gov and telephone number 906-250-7564.

Sincerely,



Adam Wygant, Director
Oil, Gas, and Minerals Division
517-897-4828

cc: Mark Snow, EGLE
Jolene Melchiori, EGLE
Melanie Humphrey, EGLE