



Environmental Stewardship Branch  
16<sup>th</sup> Floor Queen Square  
45 Alderney Drive  
Dartmouth, NS B2Y 2N6

File No.: 4186-82/2

November 13, 2007

Helen MacPhail  
Nova Scotia Department of Environment and Labour  
PO Box 697  
Halifax, NS B3J 2T8

Dear Ms. MacPhail:

**RE: Miller's Creek Mine Extension EAS# 2007-330**  
**Draft Environmental Assessment Registration**

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As requested, Environment Canada (EC) has reviewed the Draft Environmental Impact Assessment registration document for the above-noted project received October 22, 2007. From the information provided, it is understood that the proponent plans to extend existing gypsum mining activities at the facility located at Miller's Creek in Hants County. Over a lifespan of 35-50 years, the extension project will involve surface mining of 165 hectares, with an additional 175 hectares used for stockpiles, conservation area, and roads. The expansion will include the following activities:

- Harvesting trees, stripping soil & vegetation and stockpiling for use in future site reclamation;
- Surface mining of gypsum;
- Hauling materials off-highway to crushing and screening facilities at Miller's Creek for processing;
- Installing erosion and sedimentation control structures;
- Progressively rehabilitating the site.

It is understood that the pit face will advance in sections, with an anticipated initial extraction of 100,000 tonnes per year and increasing to 1.5-2.0 million tonnes per year over the first 10-12 years of operation.

### **Mandate**

EC is responsible for administering several statutes such as the *Fisheries Act* (Section 36), *Canadian Environmental Protection Act*, *Species at Risk Act*, and the *Migratory Birds Convention Act*. EC is also the lead federal department in promoting a variety of federal policies and programs concerning the environment including the *Federal Policy on Wetland Conservation*. Based on this mandate, it is not likely that EC has any powers, duties or functions in relation to the proposed project under the Canadian Environmental Assessment Act that would require an environmental assessment. However, EC has in its possession specialist knowledge and information which may be of assistance.

### **Water Quality**

EC administers and enforces the pollution prevention and control provisions of the Fisheries Act. Section 36(3) of the Fisheries Act prohibits the deposit of deleterious substances into waters frequented by fish. In addition, subsection 5.1(1) of the Migratory Birds Convention Act (MBCA) prohibits persons

from depositing harmful substances in waters or areas frequented by migratory birds. It is the responsibility of the proponent to ensure that activities are managed so as to prevent the release of substances deleterious to fish or harmful to migratory birds.

As duly noted on page 42, the activities involved with stripping soil and excavation have the potential to cause erosion and sedimentation problems. In the implementation of erosion control measures, the proponent should, where applicable, take into account the best practices presented in Appendix A.

It is understood that at least three settling ponds will be required to support mining operations. Based on the description on page 4, it is not clear when they will be constructed.

As part of the description of the geographic location, it is mentioned on page 22 that a former spoils area has become a small lake as a result of a beaver dam. The location of this small lake should be described in relation to the project footprint, and the nature of any spoils formerly stored at the area should be identified if the lake will be disturbed by the construction of the mine.

### Blasting Operations

The *Canadian Water Quality Guidelines for the Protection of Aquatic Life* provide information on nitrate and ammonia concentrations. These values should be considered in developing monitoring and mitigation for nitrate and ammonia that could potentially result from the use of explosives such as ANFO. To assist in avoiding non-compliance with Section 36 of the Fisheries Act due to unexpected elevated levels of ammonia and nitrate in settling pond discharge, the proponent may wish to consider Gordon F. Revey's 1996 paper, *Practical Methods to Reduce Ammonia and Nitrate Levels in Mine Water* (Mining Engineering, 48(7):61-64), which provides useful recommendations on nitrate and ammonia residue reduction.

The proponent refers to "federally approved" ANFO trucks, ANFO sausages, and magazines on page 36. For the purposes of clarity, the registration document should specify under what authority these items are federally approved.

### Dust Suppression

Dust suppression is mentioned briefly on pages 42 and 43 in terms of "operational dust reduction methods (primarily water supplied to roads)." It should be clarified if dust suppression methods will include the application of any substances other than water. In planning the use of dust suppressants, it is recommended that the following be considered:

- From an environmental quality perspective, the application of water is the preferred method of dust suppression.
- Aquatic toxicities of lignin-based lignosulfonates are considered low, but the potential offsite movement of lignosulfonates into watercourses is of ecological concern as they may reduce dissolved oxygen and increase colour and suspended solids in water. Prior to application, it should be determined if any significant migration via water drainage might occur into local streams, rivers, ponds, or lakes. It should be ensured that any lignosulfonate migration will not impact the oxygen needs of aquatic communities.
- If either calcium chloride or magnesium chloride is considered for use as a dust suppressant, it should only be used in accordance with guidance offered in the EC report entitled, *Best Practices for the use and Storage of Chloride-Based Dust Suppressants*: <http://www.ec.gc.ca/nopp/roadsalt/reports/chlorideBP/en/toc.cfm>. Excessive use or poor application of chloride dust suppressants can have negative environmental impacts.

Irrespective of the suppressant utilized, it is the responsibility of the proponent to comply with Section 36(3) of the Fisheries Act, which prohibits the deposit of deleterious substances into waters frequented by fish.

### **Air Quality**

Total suspended particulates has historically been a parameter of concern with quarry operations. The proponent has provided detail on PM2.5 and PM10 in terms of USEPA standards, but should also be aware of PM2.5 Canada-wide Standards which will be applicable in 2010, and that PM10 is included in the list of Toxic Substances in Schedule 1 of the *Canadian Environmental Protection Act*.

The proponent has listed emissions associated with the proposed expansion and used emission factors and formulas to estimate emissions generation. However, the emission factors are provided in units of grams per second and estimations of annual emissions are not provided. This would be useful data to include in the EA registration.

### **Greenhouse Gases (GHG)**

While it is appreciated that the project is expected to create a nominal amount of power-consumption in proportion to the total production of electricity in the province, the new mine operation will still utilize 1.2mW of power. Where possible, the proponent is encouraged to implement energy saving measures and ultimately minimize the generation of GHG.

In reference to page 179, the section entitled "Other Greenhouse Gases" might be misleading as the pollutants discussed in previous pages are not all GHG. EC recommends adjusting the title of this section and clarifying if this section is intended to list GHG expected to be generated onsite.

EC supports the proponent's commitment to set limits on vehicle and equipment idling and thereby reduce GHG emissions and impacts on local air quality. Using native shrubs and trees in reclamation activities to augment the degree of carbon sequestration (compared to hydroseeding) and to counter emissions generated by mine construction and operation might be considered as well. This approach to reclamation could also augment the value of the reclaimed land.

### **Wildlife**

Information potentially forthcoming from Rachel Gautreau?

### **Migratory Birds**

Information potentially forthcoming from Rachel Gautreau? Rachel advised that we would like to include the forest habitat text below...

#### **Habitat Important to Migratory Birds**

In the case of forests, mature and interior forest habitats are generally in decline and should receive careful consideration. Many of the bird species that rely on mature habitats (e.g., mature coniferous, deciduous and mixed forests) are experiencing population declines. Furthermore, some bird species generally known as "interior species" only prosper when the tracts of forest (including mature and immature stands) are relatively large and unfragmented. Understanding the potential loss and

fragmentation of interior and mature forests is an important consideration in determining a project's effect on migratory birds, including Partners in Flight priority species, and in identifying opportunities to avoid such impacts in undertaking a proposed project. Therefore, where interactions with forest habitat may occur, it is important that the EA include the following:

- Mapping that identifies mature and interior forest habitat for migratory birds in the project area (e.g., study area and footprint area);
- The area (in hectares) of mature coniferous, mature hardwood, mature mixed forest, and interior; forest habitat for migratory birds that would be lost as a result of the project;
- Stand descriptions for any mature forest stands that would be affected by the project;
- The rationale for why such habitat cannot be avoided through project routing and siting and a description of specific steps taken to minimize any unavoidable losses;
- The bird species that use areas of mature and interior forest on the site as habitat, established through suitable ground surveys and available information; and,
- An analysis of project impacts on mature and interior forest habitat for migratory birds on a regional scale, taking into account cumulative losses.

If the above information indicates the presence of priority forest habitat for migratory birds, appropriate mitigation measures to address habitat losses may be required or losses/alteration of the habitat may be deemed unacceptable given potential implications for migratory birds. EC would be in a position to assist regulators and the proponent in developing a suitable approach in such cases.

### Wetlands

Information potentially forthcoming from Rachel Gautreau?

### Effects of the Environment on the Project

EC recommends that the proponent recheck all data commentary listed in the meteorology section on page 166 for accuracy. In review of this section, several errors were noted. For example, the statement "extreme one day snowfall is 138 cm on March 19, 1993" is incorrect. 138 cm is the extreme snow depth, while the extreme one day snowfall is 53.3 cm and occurred on January 5, 1952. In another example, the statement "which includes 26 cm of average snowfall per year," does not reflect the average snowfall per year, which is about 266 cm.

In considering the full life-cycle of the project, any sensitivity to climate change should be identified and adjustments made if necessary. It may be more cost-effective to adjust design criteria at this stage than to retrofit in future.

When applying meteorological information to design parameters for infrastructure, such as sediment retention ponds, the proponent is encouraged to consider the report, Water Sector: Vulnerability and Adaptation to Climate Change (GSCI and MSC, 2000). In this report it is indicated that when accounting for the effect of climate change on extreme events, such as particularly heavy precipitation, the return periods for these events could reduce by at least a factor of 2. This would result, by the end of the century, in 100 year event amounts becoming 50 year event amounts. EC encourages the proponent to consider appropriate climatological factors and best available data so as to ensure the adequacy of sediment retention ponds and to take steps that would help ensure structures remain effective during and after storm events.

EC supports the proponent's interest in consulting on site meteorological data (page 167). Should climatological data be required to support water management structure design, it can be accessed at <http://www.climate.weatheroffice.ec.gc.ca/>. Value-added data can be obtained by consulting EC's Climate Services at 1-900-565-1111, or by e-mail to the following address: [weather.info.meteo@ec.gc.ca](mailto:weather.info.meteo@ec.gc.ca). Hydrometric station data, both archived and real-time, are available at [www.wsc.ec.gc.ca](http://www.wsc.ec.gc.ca), or by contacting Guy R. Leger at (506) 452-4021 or email: [guy.leger@ec.gc.ca](mailto:guy.leger@ec.gc.ca).

### **National Pollutant Release Inventory**

An acknowledgement of National Pollutant Release Inventory (NPRI) reporting requirements is recommended in the completion of the EA registration document. The NPRI is a federally administered program that collects data on annual on-site emissions of substances to the air, water, and land, as well as off-site transfers of substance disposal or recycling. Information is collected to assess whether risk-management activities for various industrial sources of criteria air contaminants (CACs) are resulting in reduced emissions, and to support various domestic and international programs including the Canada-wide Standards for PM and Ozone and development of Ambient Air Quality Objectives. Facilities that meet certain reporting criteria for any of the listed substances are required to report information to EC through the NPRI. Reporting to the NPRI is a legal requirement and mandatory under Canadian Law; the legal authority for the NPRI is the Canadian Environmental Protection Act, subsection 46(1).

Pits and quarries with a production quantity of 500,000 tonnes annually are required to report. As well, reporting is required when emissions of particulate matter are released to air from road dust where more than 10,000 vehicle kilometers are traveled on unpaved roads annually at a contiguous facility. For pits and quarries that are required to report under these provisions, total particulate matter, PM2.5 and PM10 must be reported (particulate matter is classified as a CAC). Other substances that might be subject to reporting from a pit or quarry operation depend on the activities occurring at the site. For example, additional CAC reporting might be required if there are stationary combustion activities occurring at the facility. Metal releases to water may be subject to reporting in the event that monitoring data of influent and effluent is available.

A spreadsheet has been designed to assist with estimating the releases of NPRI substances from crushed stone processing. This spreadsheet is available in the NPRI toolbox at [www.ec.gc.ca/npri](http://www.ec.gc.ca/npri).

Generally, facilities must review their activities and determine if there are additional substance emissions that are subject to reporting. Further details on NPRI reporting requirements may be found at [www.ec.gc.ca/npri](http://www.ec.gc.ca/npri), or by contacting the Atlantic Region NPRI office either at (902) 426-4805 or by email to the following address: [NPRI\\_ATL@ec.gc.ca](mailto:NPRI_ATL@ec.gc.ca).

### **Federal Legislation**

The accounting of applicable legislation found on page 7 of the draft registration should be expanded to include federal legislation that is relevant to the undertaking. From EC's perspective, the *Fisheries Act* (Section 36), *Canadian Environmental Protection Act*, *Species at Risk Act*, and the *Migratory Birds Convention Act* should be included. It is also suggested that the proponent list any other federal legislation applicable to the EA, but which may lie outside of EC's mandate.

EC looks forward to receipt of further information, including the finalized environmental assessment registration document, which will allow the department to contribute focused expert input to the evaluation of potential impacts and consideration of mitigation and monitoring options. In the interim, please feel free to contact me at (902) 426-8066 or [sean.steller@ec.gc.ca](mailto:sean.steller@ec.gc.ca) if you have any questions or concerns.

Best regards,

***Original Signed by Sean Steller***

Sean Steller  
Environmental Assessment Section  
Environmental Protection Operations Directorate Atlantic

cc: B. Jeffrey  
R. Gautreau  
M. Hingston  
A. Gauthier  
R. St-Pierre  
MT Grant  
D. McDonald (CEAA)

## Key Elements of an Erosion and Sedimentation Prevention and Control Strategy

- construction activities are coordinated with seasonal constraints (e.g. time clearing, grubbing, and excavation activities to avoid periods of heavy precipitation; avoid sensitive periods for fish and wildlife; shut down and stabilize the work site in accordance with pre-established criteria in advance of the winter season) {before revegetation is no longer possible and before freeze-up};
- measures are implemented, in advance of grubbing and excavation activities, that will allow surface drainage to be diverted around the work area;
- all perimeter control structures (e.g. silt fencing, sediment traps, settling ponds) are installed prior to any land disturbance;
- vegetated buffer zones are maintained as appropriate to protect resources at risk;
- the exposed soil area is minimized (by limiting the area that is exposed at any one time and by limiting the amount of time that any area is exposed);
- exposed soil is stabilized as soon as possible (e.g. dykes and berms should be stabilized with mulch, erosion control blankets or fast-growing, non-invasive, native vegetation);
- infill material is clean and free of contaminants and fines;
- stockpiles of soil are: sloped and compacted to prevent ingress of moisture; protected from erosion with mulch, plastic or geotextile; surrounded by straw, earthen berms or silt fences; and, located away from watercourses;
- sediment control structures are maintained (by repairing structural problems during and after storm events, removing accumulated sediment at regular intervals or at designated capacities, and by disposing of it at an approved site, given its unsuitability as structural fill material);
- water retained by sediment control structures is sampled and analyzed to determine if further treatment is required prior to discharge. Suspended solids concentrations **within effluent** released from sedimentation control structures should not exceed 25 mg/L (monthly average) or 50 mg/L (grab sample). (These concentrations reflect permissible limits of suspended solids in effluents subject to industry-specific regulations under Section 36 of the *Fisheries Act*);
- receiving waters are monitored to ensure maintenance of the CCME "Canadian Water Quality Guidelines" (1999) for the protection of aquatic life (and other uses as appropriate) when considered in conjunction with existing ambient water quality and site-specific factors. The "Canadian Water Quality Guidelines" (1999) for the protection of aquatic life recommends that:
  - during clear flow periods within the receiving water**, anthropogenic activities should; a) not increase suspended solids concentrations by more than 25 mg/L over background levels during any short-term exposure period (e.g. 24 h), or b) not increase the average suspended solids concentration by more than 5 mg/L above the background concentration for longer term exposures (e.g. 24 h to 30 d);
  - during high flow periods within the receiving water**, anthropogenic activities should; a) not increase suspended solids concentrations by more than 25 mg/L over background levels, when the background levels are between 25 and 250 mg/L, or b) not increase suspended solids concentrations by more than 10 % over background levels, when the background levels are greater than 250 mg/L;
- further mitigative actions are taken as necessary based on monitoring results.