



**Royal Oak
Mines Inc.**

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February 04, 1994

Mr. Archie J. Gillies
Economic Development Co-ordinator
City of Yellowknife
P.O. Box 1503
Yellowknife, N.W.T.
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Dear Mr. Gillies:

Re: Draft Guideline respecting Ambient Air Quality Criteria for Sulphur Dioxide and Total Suspended Particulate in the Northwest Territories Issued for Comment by The N.W.T. Department of Renewable Resources.

On January 05, 1994 the N.W.T. Department of Renewable Resources issued a draft guideline respecting ambient air quality criteria for sulphur dioxide and total suspended particulate in the Northwest Territories. The proposed air quality limit for both parameters would be as follows:

Sulphur	Dioxide	Total Suspended	Particulate
Annual	30 ug/m ³ (0.01 ppm)	Annual	60 ug/m ³
24 Hour	150 ug/m ³ (0.06 ppm)	24 Hour	120 ug/m ³
1 Hour	450 ug/m ³ (0.17 ppm)		

The proposed standard for ambient air quality levels for sulphur dioxide and total suspended particulate are targeted at controlling emissions from the roaster stack at the Giant mine. The N.W.T. Department of Renewable Resources has brought this proposed regulation forward in response to a complaint filed under the new N.W.T. Environmental Rights Act by two residents of Yellowknife (both well known local environmental activists). Consequently this whole issue does not come from the government's own list of environmental priorities but is driven by a special interest group who routinely oppose the presence of the Giant mine in Yellowknife.

Environment Canada monitored sulphur dioxide levels in Yellowknife on a continuous basis during the period of 1973 through 1975. During the study period, sulphur dioxide concentrations in ambient air around Yellowknife did not exceed the annual arithmetic mean Maximum Desirable national air quality objective of 30 ug/m³. One hour ambient air quality concentrations occasionally exceeded the one hour Maximum Desirable objective of 450 ug/m³ but rarely exceeded the one hour Maximum Acceptable objective of 900 ug/m³.

<u>Year</u>	<u>Percent of Time Ambient Air Quality Exceeded the Maximum Desirable Level of 450 ug/m³ sulphur dioxide in Yellowknife</u>
1973	0.12%
1974	0.25%
1975	0.48%

Environment Canada again monitored sulphur dioxide levels in Yellowknife during the period of August through November of 1992. The 24 hour Maximum Desirable national air quality objective of 150 ug/m³ was exceeded once. The one hour Maximum Desirable objective of 450 ug/m³ was exceeded 0.68% of the time. The degree to which the one hour duration Maximum Desirable air quality objective for sulphur dioxide is exceeded in Yellowknife is consistently less than 1% of the time.

The one hour Maximum Acceptable national air quality objective of 900 ug/m³ was exceeded on four occasions. The highest of these four concentrations occurred when the wind direction was from the south and consequently cannot be attributed to the Giant roaster stack.

The Giant mine roaster off gas cleaning facilities were designed in the 1950's to comply with emission standards of the day. The facility was upgraded in the 1970's to meet new standards for arsenic trioxide emissions. The imposition of a new sulphur dioxide emission standard would most probably render the facility obsolete. The addition of gas scrubbing equipment or an acid plant are neither economically nor technically feasible due to the gas cleaning process already in place to recover arsenic trioxide from the roaster off gas. At this late date in the mine life, it is doubtful whether the remaining ore reserve would be large enough to finance the installation of a replacement technology such as pressure oxidation (cost estimated to be in excess of \$30 Million). Consequently the imposition of new sulphur dioxide emission standard on the Giant roaster operation would have a major impact on the continued viability of the mine.

Scientific data collected over many years has consistently shown that the area where vegetation has been adversely impacted by the emission of sulphur dioxide from the Giant roaster lies within a radius of 1 kilometre of the stack. The area impacted since the mine came into operation in the late 1940's is relatively small when compared to the area impacted by the urban growth of the city of Yellowknife.

Our concerns with the proposed ambient air quality guideline can be summarized as follows:

- Promulgation of this guideline would establish air quality limits in the Northwest Territories for both of these parameters that are more stringent than most other jurisdictions in Canada and the US (including California and Alaska). Vermont would be the only jurisdiction with a more stringent standard for sulphur dioxide. The ability to attract industrial development to the north would be impaired by this action.
- The air quality limit being proposed for sulphur dioxide is 50% of the Maximum Acceptable national air quality objective established by the Federal Provincial Advisory Committee on Air Quality. The FPACAQ defined the "Maximum Acceptable Air Quality Objective" as being intended to provide adequate protection against effects on soil, water, vegetation, materials, animals, visibility, personal comfort and well being. The FPACAQ reported that the Maximum Acceptable Air Quality Objective should be of most concern to control agencies in their day to day operation as it was intended to provide adequate protection to receptors and guidance for long term planning.
- Data routinely collected and published by Environment Canada indicates that air quality in many Canadian urban centres frequently exceeds the air quality objective being proposed for the Northwest Territories.
- The air quality limit being proposed for total suspended particulate in the N.W.T. will often be exceeded in urban areas as a result of wind borne dust.

Royal Oak will be making a presentation to the N.W.T. Department of Renewable Resources on this issue which will include the following recommendations:

- 1) The N.W.T. should adopt the air quality objective for sulphur dioxide proposed by the Federal Provincial Advisory Committee on Air Quality. This would entail establishing the following three tier system:

Maximum Tolerable Level - an upper limit at which point regulatory action is warranted to protect the environment.

Maximum Acceptable Level - a current operating parameter that ensures ongoing protection of the environment.

Maximum Desirable Level - a future objective to be implemented as control technology permits.

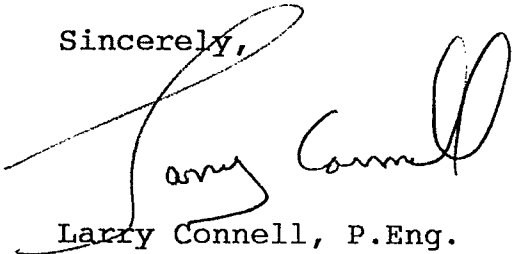
Special consideration should be given to industrial sites that were in operation before the current guideline was conceived. These industrial sites should not be forced out of business by imposition of new standards that render their existing facilities obsolete. The magnitude of the environmental impact from these sites has to be weighed against the benefits provided to the residents of the N.W.T. A tiered regulation would enable this flexibility while maintaining reasonable protection of the environment.

- 2) The N.W.T. should not adopt any standard for total suspended particulate. Adoption of the proposed guideline will serve no useful purpose. Wind borne dust levels often prevalent in the summer months in urban centres across the N.W.T. will often result in air quality outside the established standard causing undue public concern over health. Protection of the environment in the N.W.T. would be better served by establishing air quality standards for nitrous oxides and the other "hot house" gases such as carbon dioxide and carbon monoxide or by controlling the release of CFC's.

The Minister of Renewable Resources for the Northwest Territories has the authority to implement these proposed guidelines for ambient air quality under the existing N.W.T. Environmental Protection Act. The guidelines do not require any further legislative approval to be promulgated. Once enacted the Department of Renewable Resources could use the guidelines to either initiate negotiation of control orders or to establish regulations for point source control of sulphur dioxide. Promulgation of any new regulation would require passage through the N.W.T. legislature.

At this point the N.W.T. Department of Renewable Resources is looking for stakeholder input on the proposed guidelines. We would ask for your support and representation to the N.W.T. Department of Renewable Resources to ensure that whatever guidelines are eventually promulgated, a balance between the benefits provided by the continued operation of the Giant mine and reasonable environmental protection is maintained.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Connell". The signature is fluid and cursive, with a large loop at the end of the last name.

Larry Connell, P.Eng.

Manager of Environmental & Metallurgical Services