

# Detailed Description of Technical Requirements for Sudbury Area Nickel Smelters and Nickel Refineries

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## DISCUSSION PURPOSES ONLY

### Proposed definitions

1. (1) For the purposes of this document,

“facility” means a smelting or refining facility in the Sudbury area that predominantly produces nickel and is part of a class identified by NAICS codes: 331410 (Non-ferrous metal (except aluminum) smelting and refining).

“pyro-metallurgical vessel” means a vessel that can be used for smelting or refining where either:

- (a) heat is applied to the material within the vessel, such as a converter, roaster or furnace, as part of a process for changing its metallurgical properties; or
- (b) a cooling or nitrogen or oxygen blowing operation is applied to a material within that vessel as part of a process for changing the material’s metallurgical properties.

### Proposed application

2. (1) The regulation is proposed to apply to:
  - (a) Glencore Sudbury Nickel Smelter on July 1, 2021;
  - (b) Vale Sudbury Nickel Smelter on July 1, 2023; and
  - (c) Vale Sudbury Nickel Refinery on July 1, 2023.

### Proposed operating requirements

3. (1) Any pyro-metallurgical vessel at the facility must be fitted with a primary off-gas collection system.
  - (2) In addition to subsection (1), any pyro-metallurgical vessel in a converter aisle must be fitted with a secondary off-gas collection system.
  - (3) A facility shall not operate a pyro-metallurgical vessel from which sulphur dioxide emissions are conveyed to an acid plant unless the acid plant is operating in accordance with a professional recommendation.
  - (4) A facility shall not discharge sulphur dioxide from a source that is controlled by a piece of pollution control equipment, unless the pollution control equipment for that source is operating in accordance with a professional recommendation that includes:
    - (a) the operations and maintenance manual, or other similar written instructions, provided by the manufacturer of the pollution control equipment; or
    - (b) written instructions provided by the supplier of the pollution control equipment; or
    - (c) written advice, including any supporting rationale, from a licensed engineer who has experience related to the pollution control equipment.

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- (5) A facility may operate a pyro-metallurgical vessel that usually has its emissions conveyed to an acid plant, without conveying the emissions to an acid plant if the pyro-metallurgical vessel is operating under conditions where the concentrations of sulphur dioxide in the streams are less than the minimum concentration required for the acid plant converting equipment.
- (6) The minimum concentration is determined by a professional recommendation that is recorded and included in operating procedures for by-passes.
- (7) Despite subsection (4) a facility may discharge sulphur dioxide from a source that is controlled by a piece of pollution control equipment when the pollution control equipment for that source is not operating in accordance with the professional recommendation mentioned in subsection (4) if the pollution control equipment is operated under maintenance conditions.
- (8) Subsection (2) does not apply to a pyro-metallurgical vessel that was installed before this proposed regulation is made if the pyro-metallurgical vessel is a converter that refines nickel;
- (9) Subsection (2) does not apply for five years from the date the proposed regulation would apply to a pyro-metallurgical vessel that was installed before the proposed regulation is made, if the pyro-metallurgical vessel is a slag cleaning converter.

### **Proposed sulphur dioxide emissions reduction**

- 4. (1) Subject to subsection (2), no later than two years from the date the regulation is proposed to apply, the facility shall treat sulphur dioxide emissions that are collected from a pyro-metallurgical vessel and cannot be directed to an acid plant with either:
  - (a) one or more baghouses with lime injection or
  - (b) one or more wet scrubbers.
- (2) Subsection (1) does not apply if, no later than two years from the date the regulation is proposed to apply, the facility submits to the Director a plan to implement a method to reduce the sulphur dioxide emissions referred to in subsection (1) using an equivalent alternative method that includes,
  - (a) a list of all methods that are either regulatory accepted, used by other similar facilities, or are available for use, to reduce the sulphur dioxide emissions referred to in subsection (1),
  - (b) an analysis of the methods, including combinations of methods, identified under subclause (a) to determine which are technically feasible at the facility,
  - (c) the expected reduction of sulphur dioxide referred in subsection (1) that would occur for each technically feasible method, including the reduction of sulphur dioxide at points of impingement,
  - (d) an analysis of the cost-effectiveness of each technically feasible method,
  - (e) a plan on how to implement a technically feasible method that will reduce the sulphur dioxide referred to in subsection (1) in a cost-effective manner.

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- (3) If a plan is submitted under subclause (2)(e), within a year the Director shall approve the plan if he or she is of the opinion that the method mentioned in subclause (2)(e) will materially reduce the sulphur dioxide referred to in subsection (1).
- (4) If the Director does not approve the plan under subsection (3), the facility shall revise and resubmit the plan until the Director approves it.
- (5) No later than six years following the first submission of a plan under subclause (2)(e), the facility shall implement the method mentioned in subclause (2)(e) set out in the version of the plan that was approved by the Director.

### **Proposed sulphur dioxide emissions reduction, single contact acid plant**

5.
  - (1) Subject to subsection (2), if a facility has a single contact acid plant, no later than two years from the date the regulation is proposed to apply, the facility shall treat sulphur dioxide emissions that are collected from a main stack associated with a single contact acid plant with one or more wet scrubbers.
  - (2) Subsection (1) does not apply if, no later than two years from the date the regulation is proposed to apply, the facility submits to the Director a plan to implement a method to reduce the sulphur dioxide emissions referred to in subsection (1) using an equivalent alternative method that includes,
    - (a) a list of all methods that are either regulatory accepted, used by other similar facilities, or are available for use, to reduce the sulphur dioxide emissions referred to in subsection (1),
    - (b) an analysis of the methods, including combinations of methods, identified under subclause (a) to determine which are technically feasible at the facility,
    - (c) the expected reduction of sulphur dioxide referred in subsection (1) that would occur for each technically feasible method, including the reduction of sulphur dioxide at points of impingement,
    - (d) an analysis of the cost-effectiveness of each technically feasible method,
    - (e) a plan on how to implement a technically feasible method that will reduce the sulphur dioxide referred to in subsection (1) in a cost-effective manner.
  - (3) If a plan is submitted under subclause (2)(e), within a year the Director shall approve the plan if he or she is of the opinion that the method mentioned in subclause (2)(e) will materially reduce the sulphur dioxide referred to in subsection (1).
  - (4) If the Director does not approve the plan under (3), the facility shall revise and resubmit the plan until the Director approves it.
  - (5) No later than six years following the submission of the plan referred to in subclause 2(e), the facility shall implement the method set out in subclause 2(e) in the version of the plan approved by the Director.

### **Proposed emission control, requirement to continue**

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6. (1) The facility shall not operate a piece of equipment that discharges sulphur dioxide unless it is managed or controlled by the method(s) identified in the record mentioned in subsection (2) or a method that, in the opinion of the Director, is at least as effective at controlling the discharge of sulphur dioxide to the air, as of the date the proposed regulation is made.
- (2) No later than 3 months after the date the regulation is proposed to apply, the facility shall make a written record that sets out the following information:
  - (a) Each piece of equipment that may discharge sulphur dioxide at the facility.
  - (b) Each method that prevents, minimizes or reduces the discharge of sulphur dioxide from the source mentioned in paragraph 1.
  - (b) The date which each source and method was in place at the facility.
  - (d) Recommendations or guidance for the operation of the methods referred to in paragraph 2 in respect of the reduction of the discharge of sulphur dioxide.
  - (e) The manufacturer's equipment design specification for sulphur dioxide removal if the method mentioned in paragraph 2 is an acid plant.
  - (f) The methods used to reduce the peak community concentrations of sulphur dioxide emissions, including five minute peaks, during maintenance procedures.
- (3) The facility shall update the record no later than 30 days after,
  - (a) a new piece of equipment that may discharge sulphur dioxide is added to the facility; or
  - (b) a change in method occurs.
- (4) Subsection (1) does not prevent a facility who has implemented a method specified in subsection 4(1) from replacing that method with another method specified in subsection 4(1).
- (5) this does not include methods for slag pouring.
- (6) A method mentioned in this section includes methods such as,
  - (a) the use of an air pollution control device;
  - (b) the use of industrial ventilation for the capture of emissions;
  - (c) the selection and use of equipment that more effectively prevents, minimizes or reduces the discharge of sulphur dioxide than the selection or use of other equipment;
  - (d) the operation of a process or a piece of equipment in a manner that prevents, minimizes or reduces the discharge of sulphur dioxide into the air from the process or piece of equipment;
  - (e) forecasting procedures for reducing impact on the community; and
  - (f) the design, installation and operation of a stack in a manner that increases the dispersion of contaminants.

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### **Proposed report on the concentration of ambient sulphur dioxide**

7. (1) In a notice provided to the facility, the Director may identify up to 3 monitors that, in the opinion of the Director, would accurately measure the concentration of sulphur dioxide in the community from:
  - (a) fugitive emissions discharged from the buildings at the facility that contain a pyro-metallurgical vessel.
  - (b) stack emissions discharged from the facility
- (2) No later than March 31 in the year following the year the notification was given under subsection (1), and each year thereafter, the facility shall submit a report to the Director that indicates all the hourly concentrations of sulphur dioxide over 120 ppb during the previous calendar year measured at each of the monitors identified by the Director in accordance with subsection (1).

### **Proposed sulphur dioxide, capture efficiency report**

8. (1) No later than two years from the date the regulation is proposed to apply, a facility shall submit a report to the Director titled "Emission Assessment and Capture Efficiency".
- (2) The report required under subsection (1) shall set out the results of the study performed in accordance with a plan approved under subsection (4).
- (3) No later than one year from the date the regulation is proposed to apply, a facility shall submit a plan to the Director titled "Plan to Assess Fugitive Emissions and Determine Capture Efficiency of the Off-gas Collection System for converter aisle buildings with a pyro-metallurgical vessel" that sets out the following information about the facility:
  - (a) A description of the pyro-metallurgical vessel processes in buildings with converter aisles including process flow diagrams.
  - (b) A drawing of the buildings with converter aisles that contain pyro-metallurgical vessel that sets out all pollution control methods, ventilation systems and openings such as doors, windows, louvers and bays.
  - (c) An explanation of the model that will be used to determine the information mentioned in subsection (4). The model shall be a physical model, computational fluid dynamic model or similar model, or an equivalent method, including a method that incorporates the use of source testing and mass balance calculations.
  - (d) The parameters that will be measured and the location of each measurement.
  - (e) A description of the range of operating conditions over which the capture efficiency study will be performed.
  - (f) The calculations that will be used to determine the capture efficiency and calculations that will be used to determine the fugitive emissions being discharged, including sample calculations and any assumptions made.

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- (4) The Director may approve the plan if it contains the information required under (3) and, in the opinion of the Director, would enable the facility to accurately determine:
- (a) the concentration of sulphur dioxide in fugitive emissions discharged from the converter aisle buildings at the facility that contain a pyro-metallurgical vessel; and
  - (b) the capture efficiency of each secondary off-gas collection system associated with converter aisle buildings at the facility that contain pyro-metallurgical vessel.
- (5) The facility shall notify the Director at least 30 days before measurements are taken for the purpose of performing the study performed in accordance with the plan approved under subsection (4).
- (6) After receiving the Report required under subsection (1), the Director may give written notice to a facility requiring the submission of additional information, including information resulting from additional measurements, if the Director is of the opinion that more information is needed to accurately determine
- (a) the concentration of sulphur dioxide in fugitive emissions discharged from converter aisle buildings at the facility that contain a pyro-metallurgical vessel; and
  - (b) the capture efficiency of each secondary off-gas collection system associated with converter aisle buildings at the facility that contain pyro-metallurgical vessel.
- (7) Before the Director gives a person a notice under subsection (6), the Director shall give the person a draft of the notice and an opportunity to make written submissions to the Director during the period that ends 30 days after the draft is given.

### **Proposed sulphur dioxide, root cause analysis and corrective and preventive action report**

9. (1) If the report required under subsection 7(1) indicates there was an hourly concentration of sulphur dioxide in the previous calendar year that was greater than 120 ppb, the facility shall submit a report to the Director titled “Root Cause Analysis and Corrective and Preventive Action Report” by March 31st of the following year.
- (2) The Root Cause Analysis and Corrective and Preventive Action Report required under subsection (1) shall include a detailed analysis of all contributing factors, all complaints received and underlying primary causes of the monitor recording an hourly concentration level of sulphur dioxide that was greater than 120 ppb and an identification of the measures and corrective and preventive actions that can be implemented at the facility, as well as a timeline for implementation, to prevent recurrence of the root causes that lead to these concentrations.
- (3) The facility shall implement at least one of the recommended corrective and preventive actions in accordance with the timelines set out in the report required under subsection (1)
- (4) If the Director is of the opinion that additional information is needed in respect of the report required under subsection (2), the Director may provide a written notice to the facility requiring it to provide this information by the deadline specified in the notice.

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## DISCUSSION PURPOSES ONLY

### Proposed sulphur dioxide reduction projects, action plan effectiveness report

- 10.** (1) A facility shall submit a report to the Director that sets out the effectiveness of measures implemented from January 1, 2016 to the date the regulation is proposed to apply at reducing the concentration of sulphur dioxide at points of impingement.
- (2) A report required under (1) shall be submitted no later than one year from the date the regulation is proposed to apply.

### Proposed summary reports

- 11.** (1) A facility shall ensure that annual summaries for each calendar year are made in accordance with this section.
- (2) The annual summaries shall be completed by March 31 of the following year and contain information in respect of the previous calendar year.
- (3) The annual summaries required under this section are the following:
- (a) A table titled "Implementation Summary Table" containing a summary of the provisions of the regulation that is proposed to apply to the facility and for each provision that is proposed to apply,
- (i) the date on which the provision first applied to the facility, and
- (ii) if compliance with the provision has been achieved, the date on which compliance was achieved.
- (b) A summary containing the information required in a record prepared for the purposes of the required reports.

### Proposed records

- 12.** (1) A facility shall ensure that each record required by the proposed regulation is retained at the facility for at least five years.
- (2) A facility shall make a record under subsection (1) available,
- (a) to a provincial officer or Director upon request as soon as practicable; and
- (b) in a form approved by the Director, including, if required by the Director, an electronic format specified by the Director.
- (3) In addition to the records mentioned in subsection (1), a facility shall ensure that each document relating to the recommendations of the manufacturer for each device at the facility with respect to the use, operation and maintenance of the device is retained for the period during which the device is used or operated.