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# DRAFT FOR DISCUSSION

## PROPOSED TECHNICAL STANDARD FOR ONTARIO'S CARBON BLACK SECTOR

### Context / background

- Sulphur dioxide (SO<sub>2</sub>) emitted from the Carbon Black industry is a serious concern. There are two Carbon Black facilities in Ontario. These facilities are located in Sarnia and Hamilton and affect local air quality.
- As of July 1, 2023, new (annual) and updated (hourly) SO<sub>2</sub> air standards under O. Reg. 419/05 (Local Air Quality Regulation) will come into force, as set out in the decision notice in Environmental Registry of Ontario posting #013-0903.
- Ontario's Carbon Black facilities have indicated that they do not expect to be able to comply with the new and updated air standards.

### Purpose of this document

To outline key proposed requirements of a technical standard for the Carbon Black sector, to which Ontario's Carbon Black facilities ("facilities") may apply for registration. If published and the facilities register to the technical standard, the facilities would need to comply with the applicable requirements in the technical standard. These proposed requirements are intended to minimize SO<sub>2</sub> emissions (and potentially other contaminants of concern) and the associated impact of these emissions from these facilities on neighbouring communities.

### Proposed Requirements

This proposed technical standard applies to Ontario's Carbon Black facilities (NAICS Code 325189) and for sulphur dioxide.

#### **1. Installation of Air Pollution Control Systems**

When applying to register for this proposed technical standard, facilities are required to elect whether the air pollution control system(s) (i.e., wet scrubber or alternate device or method with the same or greater effectiveness as a wet scrubber) described by Item 1.1 or Item 1.2 will be installed at the facility.

#### Amendment of Election

A registered facility electing to install the air pollution control system(s) described by Item 1.1 is not permitted to amend this election.

Within one year of registration, a registered facility electing to install the air pollution control system(s) described by Item 1.2 can, by written notice to the ministry, amend this election to the installation of an air pollution control system(s) described by Item 1.1.

### 1.1 Installation of an Air Pollution Control System for SO<sub>2</sub>

Facilities must install and continuously operate an air pollution control system(s) that achieves a **95% reduction in the emissions of SO<sub>2</sub>** from all process sources necessary for the production of carbon black that have the potential to emit SO<sub>2</sub> potentially including but not limited to: feedstock heaters, pre-heaters, reactors, bag collectors, dryers, thermal oxidizers and boilers.

The percent reduction is to be determined based on the comparison of the concentration of SO<sub>2</sub> at the inlet to the air pollution control system(s) to the concentration of SO<sub>2</sub> at the outlet of the air pollution control system(s). This reduction will be determined using the Continuous Emissions Monitoring System (CEMS) pursuant to Item 2.

The air pollution control system(s) must be installed and operational **by July 1, 2026**, and operate within the interim emission limits by the dates described by Item 5 and the final emission limits by the dates described by Item 6.

### 1.2 Installation of an Air Pollution Control System for SO<sub>2</sub> and potentially other Contaminants of Concern

Facilities must install and continuously operate an air pollution control system(s) that achieves a **98% reduction in the emissions of SO<sub>2</sub>** from all process sources necessary for the production of carbon black that have the potential to emit SO<sub>2</sub> potentially including but not limited to: feedstock heaters, pre-heaters, reactors, bag collectors, dryers, thermal oxidizers and boilers.

The percent reduction is to be determined based on the comparison of the concentration of SO<sub>2</sub> measured at the inlet of the air pollution control system(s) to the concentration of SO<sub>2</sub> at the outlet of the air pollution control system(s). This reduction will be determined using the Continuous Emissions Monitoring System (CEMS) pursuant to Item 2.

The air pollution control system(s) must be installed and operational **by July 1, 2028**, and operate within the interim emission limits by the dates described by Item 5 and the final emission limits by the dates described by Item 6.

An air pollution control system(s) installed in accordance with this item shall also reduce the emissions of other contaminants of concern from the carbon black production process. The requirements set out in this proposed technical standard will only apply to reducing the SO<sub>2</sub> emissions from all process sources necessary for the production of carbon black.

### 1.3 Interim Actions to reduce SO<sub>2</sub>

As an interim measure to reduce SO<sub>2</sub> emissions prior to the operation of the system(s)

set out in Items 1.1 or 1.2, facilities must prepare a report on proposed actions to minimize SO<sub>2</sub> emissions.

This report must be submitted to the ministry within six months of registration and set out measures and timeframes to reduce SO<sub>2</sub> emissions that include considerations for: (i) the use of feed stocks with a sulphur content lower than feedstocks used at the facility prior to July 1, 2023; (ii) the use of dry sorbent injection systems; and (iii) other methods to reduce the emission of SO<sub>2</sub> from the facility operations.

## **2. Monitoring Requirements for SO<sub>2</sub>**

### **2.1 Continuous Emissions Monitoring System (CEMS)**

Beginning no later than the date at which the control technology specified in Items 1.1 or 1.2 become operational, facilities shall use Continuous Emissions Monitoring Systems to continuously monitor both the inlet and outlet concentration of SO<sub>2</sub> from the air pollution control system (s) simultaneously during the operation of the process sources necessary for the production of carbon black (as defined in Items 1.1 and 1.2) and to demonstrate compliance with the SO<sub>2</sub> emission reduction requirements set out in Items 1.1 and 1.2.

An application to register to this proposed technical standard will be required to include a Continuous Emissions Monitoring plan for the ministry's approval. The Continuous Emissions Monitoring Systems will be required to be installed, calibrated, certified, maintained and operated in accordance with the approved plan and the technical standard. The proposed technical standard will set out the information requirements for this plan.

Facilities will be required to retain records of SO<sub>2</sub> emissions data from the CEMS.

### **2.2 Ambient Air Monitoring**

An application to register to this proposed technical standard will be required to include an Ambient Air Monitoring plan for approval for the installation, operation and maintenance of at least one ambient air monitor for SO<sub>2</sub> in the vicinity of each facility in location(s) determined by the ministry to assess SO<sub>2</sub> concentrations in the local community. This plan shall consider options to make "live" data public (similar to real-time air monitoring data available from [Clean Air Sarnia and Area](#), and [Hamilton Air Monitoring Network](#)). The proposed technical standard will set out the information requirements for this plan. A registered facility shall begin operating their ambient air monitor(s) by the date specified by the Director in the written approval of the plan.

Facilities shall track and report, as described in section 8, the following information:

- 1-hour exceedances of 120 ppb SO<sub>2</sub> at all community monitors, which is above the Ambient Air Quality Criterion of 40 ppb (100 µg/m<sup>3</sup>) but lower than the Upper Risk Threshold of 250 ppb (690 µg/m<sup>3</sup>).

- 5-minute exceedances of 200 ppb SO<sub>2</sub> at these monitors, which is above the short-term Ambient Air Quality Criterion of 67 ppb (~180 µg/m<sup>3</sup>). Short-term exposures to 200 ppb can cause asymptomatic reductions in lung function for some asthmatics.

### **3. Optimization and Demonstration Study for SO<sub>2</sub> Air Pollution Control Systems**

Starting no later than the date set for the operation of the air pollution control systems described under Items 1.1 and 1.2, facilities shall conduct, for a period of 18 months, an “Optimization and Demonstration Study” (Study). Three months prior to this date, facilities shall submit a work plan for the Study to the ministry for review and approval. The proposed technical standard will set out the information requirements for this work plan.

Within 30 days of the completion of the first 3 months of the Study, facilities shall submit to the ministry an interim written report that includes detailed data on operating conditions and emissions, an assessment of collected data, and conclusions as to whether or not the systems described by Items 1.1 or 1.2 have achieved the required reduction in SO<sub>2</sub> emissions based on an analysis of the data from that period as well as the relevant information to support the conclusions. If required, this report should also set out the corrective actions implemented to achieve the required reductions in SO<sub>2</sub> emissions set out by Items 1.1 and 1.2.

During the last 15 months of the Study, facilities shall operate in a manner consistent with the conclusions set out in the interim written report with the objective of managing SO<sub>2</sub> emissions to at least meet the reduction requirements set out by Items 1.1 or 1.2.

### **4. Optimization and Demonstration Report**

No later than 60 days after concluding the Study, facilities shall submit to the ministry the results of the Study in a written “Study Report” that shall include the following information:

- Hourly average concentrations of SO<sub>2</sub> and O<sub>2</sub> at the point of emission to air and at the inlet to the air pollution control system, as measured by CEMS during the Study and each hourly average value of air pollution control system operating parameters (to be listed in detail).
- An evaluation of the reduction of SO<sub>2</sub> emissions by the air pollution control systems installed as required by Item 1.1 or 1.2, and an identification of the optimum range of each of the air pollution control system operating parameters.
- Proposed SO<sub>2</sub> emission limit(s) at the point of emission to air, in ppmv (dry, at 0% oxygen) at the averaging times specified by the ministry. It’s anticipated that a range of emission limits will be required due to potential variability in the sulphur levels in feedstock materials.

- Any other information that the ministry identifies as relevant to its evaluation of the Study.

## **5. Compliance with Proposed Emission Limits**

Immediately after submitting the Study Report as per Item 4 above, and until the final emission limit(s) at the point of emission to air are established by the ministry pursuant to Item 6, facilities will be required to comply with the proposed SO<sub>2</sub> emission limit(s) listed in the Study Report.

## **6. Ministry Established Final Emission Limits**

The ministry will establish the final SO<sub>2</sub> emission limit(s) at the point of emission to air based on the level of performance of the air pollution control system during the Study and other available and relevant information.

## **7. Compliance with the Emission Limits and Potential Corrective Actions**

The facilities shall notify the ministry as soon as practicable whenever the emission limits described by Item 6 are exceeded.

A facility exceeding the SO<sub>2</sub> emission limit(s) described by Item 6 will need to prepare a “Root Cause Analysis, Corrective and Preventive Action Report” (RCA Report) and submit this report to the ministry. The RCA Report shall include an evaluation of the ambient monitoring data during the averaging period to assess the potential facility contribution to the measured concentrations. The RCA Report shall detail the root causes contributing to the event, the corrective actions implemented or to be implemented with timelines and an assessment of the effectiveness or expected effectiveness of the corrective actions. This report is to be submitted within 60 days of the SO<sub>2</sub> emission limit(s) being exceeded. Depending on the circumstances of the exceedance, facilities may also be requested to submit incident-specific emissions information and/or air dispersion modelling of the exceedance period.

## **8. Reporting Requirements**

In order to assess environmental outcomes and facility compliance, facilities will be required to assess monitoring data and provide reports to the ministry and the public in a ministry approved format in accordance with the below proposed intervals.

### **8.1 Quarterly reporting**

On a quarterly basis, facilities shall submit to the ministry a report with the following information in an approved format:

- a summary of all exceedances of the interim or final (as applicable) SO<sub>2</sub> emission limits.

- a summary of all 1-hour monitored values over 120 ppb or 5-minute monitored values over 200 ppb at any of the ambient SO<sub>2</sub> monitoring stations.

Facilities shall make these quarterly reports available to the public by posting them on their website.

## **8.2 Annual reporting**

On an annual basis starting at a date specified by the ministry after the final SO<sub>2</sub> emission limit(s) are established facilities shall submit to the ministry a report with the following information in an approved format:

- SO<sub>2</sub> emissions measured at the outlet of the air pollution control system.
- summary of any generated RCA Reports and the assessed effectiveness of the identified and timely implemented corrective and preventive actions according to proposed implementation schedules in the RCA Reports.

Facilities shall make these annual reports available to the public by posting them on their website.

## **8.3 Public reporting on an ongoing basis**

Facilities shall make SO<sub>2</sub> emissions data from the CEMS at the outlet of the air pollution control systems available to the public by posting the data on their facility website. Data must be posted to the website within 60 days of the data collection. This reporting is proposed to initiate after the date when the final SO<sub>2</sub> emission limits are established in accordance with Item 6.

Facilities shall also make data from the ambient SO<sub>2</sub> monitors described in Item 2.2 publicly available in accordance with the facility's Ambient Air Monitoring plan.

## **9. Operation Requirements for the Air Pollution Control System(s)**

Facilities shall implement operation and maintenance procedures for the air pollution control systems required under Item 1.1 or 1.2. The operation and maintenance procedures shall be such that the reduction in SO<sub>2</sub> emissions set out by Items 1.1 or 1.2 can be achieved.

Monitoring, reporting and record keeping of operating parameters and maintenance requirements for the installed air pollution control systems will also be required.

## **10. Other Requirements**

Procedures to manage complaints and notifications to the ministry will be required.

## Timing of Requirements

Item	Description	Timing
1	Election to install an air pollution control system described by either Item 1.1 or 1.2	When applying to register to the technical standard.
1	If required, amendment of election to install an air pollution control system described by Item 1.2 to a system described by Item 1.1	Within one year of registration.
1.1 or 1.2	Install air pollution control system(s)	July 1, 2026, or 2028, depending upon election in item 1
1.3	Report on interim actions to reduce SO <sub>2</sub>	When applying to register to the technical standard.
2.1	Begin operation of CEM system for air pollution control system described by Item 1.1	July 1, 2026
2.1	Begin operation of CEM system for air pollution control system described by Item 1.2	July 1, 2028
2.1	Submit CEMS monitoring plan to the ministry for an air pollution control system described by Item 1.1 or Item 1.2	When applying to register to the technical standard
2.2	Submit and ambient SO <sub>2</sub> monitoring plan	When applying to register to the technical standard
3.1	Commence Optimization and Demonstration Study for air pollution control system described by Item 1.1	July 1, 2026
3.1	Submit interim report for air pollution control system described by Item 1.1	Within 30 days of the completion of the first 3 months of operation
4.0	Submit Optimization and Demonstration Report for air pollution control system described by Item 1.1	Within 60 days of the completion of the first 18 months of operation
3.1	Commence Optimization and Demonstration Study for air pollution control system described by Item 1.2	July 1, 2028
3.1	Submit interim report for air pollution control system described by Item 1.2	Within 30 days of the completion of the first 3 months of operation
4.0	Submit Optimization and Demonstration Report for air pollution control system described by Item 1.2	Within 60 days of the completion of the first 18 months of operation
5.0	Compliance with Proposed Interim Limits	Same as the Item 4.0 date for the air pollution control



Item	Description	Timing
		systems described by Items 1.1 and 1.2
6.0	Compliance with Ministry Established Final Emission Limits	Upon notification by the ministry
8.0	Quarterly exceedance reports for CEM and ambient SO <sub>2</sub> data.	Quarterly starting at a date specified by the ministry after the final SO <sub>2</sub> emission limit(s) are established.
8.0	Annual reports for CEM and ambient SO <sub>2</sub> data.	Annually starting at a date specified by the ministry after the final SO <sub>2</sub> emission limit(s) are established.