MONTROSE ENVIRONMENTAL

SO_2 Emission Minimization Plan for Suncor Energy Products Partnership Sarnia Refinery

Prepared for:

Suncor Energy Products Partnership
Sarnia Refinery

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1. Sulphur Dioxide (SO_2) Minimization Plan

1.1 *Regulatory Applicability*

Section 36 (Sulphur dioxide minimization plan and reports) of the regulation outlines the following requirements:

- A petroleum facility who discharges sulphur dioxide into the air shall provide information regarding plan contents to the director no later than January 1, 2024
- A description of the measures to be implemented at the petroleum facility to ensure compliance with sections 8 to 17
- Quantification of SO_2 reduction must be provided for each measure previously outlined
- Provide date by which the measure is expected to be implemented at the facility
- An updated plan is required and must be approved by the director before any modifications are made, construction of new equipment, a change in the operation of existing equipment or a change to emission control equipment
- The plan must be dated, signed and sealed by a licensed engineering practitioner and must set out the practitioner's name and license number

Suncor Sarnia intends to comply with all O. Reg. 88/22 for all normal plant operations.

The following table outlines the sections of O. Reg. 88/22 that apply to the Suncor Sarnia refinery.

Section	Applicable Equipment
8	Houdry Catalytic Cracker, Boilers 04H110 & 04H115
9	SRU/Incinerator
13	Main Plant Flare, Plant 3 Acid Gas Flare, Plant 4 Acid Gas Flare, Alternate Flare
16	Facility heaters, Main Plant Flare, Plant 3 Acid Gas Flare, Plant 4 Acid Gas Flare, Alternate Flare
17	All equipment listed above

1.2 *Catalytic and thermal cracking units*

1.2.1 Measures to be implemented

Suncor is currently considering multiple measures to achieve compliance with the O. Reg. 88 limits for the HCC and CO Boilers. It is anticipated that a decision will be made by the end of Q3 2024 on the preferred path forward for implementation.

1.2.2 SO_2 Reduction Quantification

The specifications, details on the removal efficiencies and detailed spec sheets will be provided by the end of Q3 2024 once the preferred measure has been decided. All projects being considered will be designed to reduce the SO_2 concentration from the HCC below the limit of 150 ppm (365-day average) as outlined in O. Reg. 88.

1.2.3 Expected date of implementation

Potential measures to be implemented for the Houdri catalytic cracker are still in early planning stages. Additional details and timing will be provided at a later date. Implementation will take place prior to December 31, 2026.

1.3 *Sulphur recovery unit with incinerator, measuring oxygen*

1.3.1 Measures to be implemented

The design of the Sulphur Plant that was implemented in 2006 including two SRU's, a TGTU, thermal oxidizer and a liquid sulphur storage tank, requires no additional measures to comply with the requirements of O. Reg. 88.

1.3.2 SO_2 Reduction Quantification

The design and operations of the Sulphur Plant already meets the requirements of O. Reg. 88. Other than ensuring reliable operation of the facility, there are no other areas identified to communicate at this time which would result in further reduction. If areas where further reduction can be achieved are identified later on, Suncor will provide an update.

1.3.3 Expected date of implementation

At this time, there are no additional measures that need to be implemented.

1.4 *Flares, mass emission rate of sulphur dioxide*

1.4.1 Measures to be implemented

Suncor is currently considering multiple measures to achieve compliance with the O. Reg. 88 limits for the Main Plant Flare, Plant 3 Acid Gas Flare and Plant 4 Acid Gas Flare. It is anticipated that a decision will be made by the end of Q3 2024 on the preferred path forward for implementation.

1.4.2 SO_2 Reduction Quantification

The specifications, details on the removal efficiencies, and detailed spec sheets will be provided by the end of Q3 2024 once the preferred measure has been decided. All projects being considered will be designed to reduce the SO_2 quantity from each of the 3 Flares below the 225 kg/24-hour period as detailed in O. Reg. 88.

1.4.3 Expected date of implementation

Potential measures to be implemented for the flares are still in early planning stages. Additional details and timing will be provided at a later date. Implementation will take place prior to December 31, 2026.

1.5 *Hydrogen sulphide in fuel gas*

Since Suncor intends to monitor the fuel gas hydrogen sulphide (H_2S) content, as referenced by the *Continuous Emissions Monitoring Plan Version 2.0*, all general combustion devices (heaters) are governed by Section 16 of the regulation.

1.5.1 Measures to be implemented

Capital plans are currently being developed to install CEMs at several points within the fuel gas system, which will be used to monitor H_2S content.

Suncor currently takes daily grab samples of the refinery fuel gas at each of these 4 locations, they are analyzed by the on-site lab for H_2S concentration. This daily sampling will continue until the CEMs is operational at all the applicable fuel gas measurement locations.

There is one heater that will require measures to be implemented prior to Dec 31, 2026, that is 25H01 located in the Plant 2 vacuum unit. Suncor is currently considering multiple measures to achieve compliance with the O. Reg. 88 limits

for 25H01. It is anticipated that a decision will be made by the end of Q3 2024 on the preferred path forward for implementation.

1.5.2 SO_2 Reduction Quantification

The specifications, details on the removal efficiencies, and detailed spec sheets will be provided by the end of Q3 2024 once the preferred measure has been decided for 25H01. All projects being considered will be designed to reduce the H_2S quantity in the refinery fuel gas below 60 ppm.

1.5.3 Expected date of implementation

Potential measures to be implemented for 25H01 are still in early planning stages. Additional details and timing will be provided at a later date. Implementation will take place prior to December 31, 2026.

1.6 *Annual mass emission limits, sulphur dioxide*

1.6.1 Measures to be implemented

Refer to Sections 1.2.1, 1.3.1, 1.4.1 and 1.5.1 for details related to reduction measure.

1.6.2 SO_2 Reduction Quantification

Refer to Sections 1.2.2, 1.3.2, 1.4.2 and 1.5.2 for detailed reduction calculations.

1.6.3 Expected Date of Implementation

Refer to Sections 1.2.3, 1.3.3, 1.4.3, and 1.5.3 for timeline details.

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