# EXECUTIVE SUMMARY

Cabot Canada Ltd (Cabot), located at 800 Tashmoo Avenue in Sarnia, Ontario (Site), currently operates under Environmental Compliance Approval (Air & Noise) No. 5893-9M3SM4, issued August 8, 2014 by the Ministry of the Environment, Conservation and Parks (MECP).

Cabot is a manufacturer of carbon black using liquid hydrocarbon feedstock. The NAICS code for Cabot Canada Ltd. is 325189 (All Other Basic Inorganic Chemical Manufacturing).

This Emission Summary and Dispersion Modelling (ESDM) report follows Ontario Regulation 419/05 (Air Pollution – Local Air Quality) and meet the requirements of, and demonstrates compliance with, the following MEPC documents:

- "Procedure for Preparing an Emission Summary and Dispersion Modelling Report [Guideline A-10]", version 4.1 (March 2018), PIBs # 3614e04.1;

- "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", Version 2.0 (April 2018)

The Site is a Schedule 5 target sector, and is therefore required to show compliance with Schedule 3 Standards of the O. Reg. 419/05. This ESDM report includes the quantification of emission rates for all significant sources of contaminants associated with the application and an estimation of the aggregate maximum 24-hour (and all other applicable time-averaging periods) point-of-impingement (POI) concentration for each individual contaminant identified as significant.

AERMOD dispersion model version 16216r (version date January 17, 2017) was used in conjunction with AERMET meteorological pre-processor version 16216 (version date August 3, 2016) to predict the POI concentrations for all significant contaminants of concern and to assess compliance to Schedule 3 standards of the O. Reg. 419/05.

This ESDM Report incorporates modifications and/or updated information and is accurate to as of December 31, 2019.

The following Emission Summary Table summarizes all of the significant air contaminants released from the site, the total site-wide maximum emission rate and maximum POI concentration for each contaminant, the POI limit used to evaluate each contaminant and the percent of the modelled POI concentration relative to the applicable POI limit.

As shown in the Emission Summary Table, the maximum POI concentrations of all significant contaminants released from the Site are compliant with the respective air quality criteria.

## Table (i) Emission Summary Table

| Contaminant CAS # | Contaminant Name | Total Facility Emission Rate (g/s) | Air Dispersion Model Used [Note 1] | Maximum POI Concentration (µg/m³) | Averaging Period (hours) | Maximum POI Limit (µg/m³) | Limiting Effect | Source | Category | Percentage of MECP POI Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulphur Dioxide - 24-hour | 7446-09-5 | 2.56E+01 | AERMOD | 194.0 | 24-hour | 275 | Health & Vegetation | Standard | B1 | 70.5 |
| Sulphur Dioxide - 1-hour | 7446-09-5 | 2.56E+01 | AERMOD | 489.0 | 1-hour | 690 | Health & Vegetation | Standard | B1 | 70.9 |
| Hydrogen Sulphide | 7783-06-4 | 4.81E-03 | AERMOD | 5.9 | 24-hour | 7 | Health | Standard | B1 | 84.3 |
| Hydrogen Sulphide | 7783-06-4 | 4.81E-03 | AERMOD | 3.96 | 10-minute | 13 | Odour | Standard | B1 | 30.5 |
| Nitrogen Oxides - 24-hour | 10102-44-0 | 1.09E+00 | AERMOD | 31.53 | 24-hour | 200 | Health | Standard | B1 | 7.9 |
| Nitrogen Oxides - 1-hour | 10102-44-0 | 1.09E+00 | AERMOD | 77.98 | 1-hour | 400 | Health | Standard | B1 | 15.8 |
| Carbon Dioxide | 124-38-9 | 4.14E+02 | AERMOD | 10181.76 | 24-hour | 255800 | Health | SL-PA | B2 | 19.5 |
| Potassium acetate | 127-08-2 | 2.25E-03 | AERMOD | 2.50 | 24-hour | 15 | Health & Particulate | SL-JSL | B2 | 16.7 |
| Carbon Black | 1333-86-4 | 3.64E-02 | AERMOD | 3.54 | 24-hour | 10 | Soiling | Standard | B1 | 35.4 |
| Carbonyl Sulphide | 463-58-1 | 9.55E-02 | AERMOD | 12.02 | 24-hour | 13 | Health | SL-JSL | B2 | 92.5 |
| Benzo[a]pyrene - Annual | 50-32-8 | 9.84E-08 | AERMOD | 1.31E-06 | Annual | 0.00001 | Health | Standard | B1 | 13.1 |
| Carbon Monoxide | 630-08-0 | 1.64E+01 | AERMOD | 2088.51 | Half-hour | 6000 | Health | Standard | B1 | 34.8 |
| Catalytic Cracked Clarified Oil (Petroleum) | 64741-62-4 | 1.80E-02 | AERMOD | 31.79 | 24-hour | 60 | Health | SL-JSL | B2 | 53.0 |
| Fuel Oil, Residual | 68476-33-5 | 1.80E-02 | AERMOD | 31.79 | 24-hour | 50 | Health | SL-JSL | B2 | 63.6 |
| Benzene - Annual | 71-43-2 | 1.86E-03 | AERMOD | 0.05 | Annual | 0.45 | Health | Standard | B1 | 11.0 |
| Lead -24-hour | 7439-92-1 | 8.01E-08 | AERMOD | 7.79E-06 | 24-hour | 0.5 | Health | Standard | B1 | <0.1 |
| Lead - 30-day | 7439-92-1 | 8.01E-08 | AERMOD | 1.79E-06 | 30-day | 0.2 | Health | Standard | B1 | <0.1 |
| Hydrogen Cyanide | 74-90-8 | 5.43E-02 | AERMOD | 1.57 | 24-hour | 8 | Health | Standard | B1 | 19.6 |
| Carbon Disulphide | 75-15-0 | 3.60E-01 | AERMOD | 37.50 | 24-hour | 330 | Odour | Guideline | B1 | 11.4 |
| Naphthalene - 24-hour | 91-20-3 | 5.10E-08 | AERMOD | 4.96E-06 | 24-hour | 22.5 | Health | Guideline | B1 | <0.1 |
| Naphthalene - 10-minute | 91-20-3 | 5.10E-08 | AERMOD | 2.64E-05 | 10-minute | 50 | Health | Guideline | B1 | <0.1 |
| Particulate Mater | N/A-PM | 5.07E-01 | AERMOD | 9.19 | 24-hour | 15 | Visibility | Standard | B1 | 61.3 |

Notes:
[1] All AERMOD dispersion modelling was conducted using AERMOD version 16216r

## Table (ii) Modelling Assessment Values for Contaminants with Annual Air Standards

| Contaminant CAS # | Contaminant Name | Total Facility Emission Rate (g/s) | Air Dispersion Model Used [Note 1] | Annual Standard | | | Annual Assessment Value (AAV) | | | Daily Assessment Value (DAV) / Upper Risk Threshold (URT) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Annual Standard (µg/m³) | Annual POI Conc. (µg/m³) | % of Annual Standard | AAV (µg/m³) | AAV POI Conc. (µg/m³) | % of AAV | DAV/URT (µg/m³) | DAV/URT POI Conc. (µg/m³) | % of DAV/URT |
| Benzo[a]pyrene | 50-32-8 | 9.84E-08 | AERMOD | 0.00001 | 1.31E-06 | 13.1 | 0.0001 | 1.31E-06 | 1.3 | 0.005 | 9.57E-06 | 0.2 |
| Benzene | 71-43-2 | 1.86E-03 | AERMOD | 0.45 | 0.05 | 11.0 | 4.5 | 0.05 | 1.1 | 100 | 0.45 | 0.5 |

Notes:
[1] All AERMOD dispersion modelling was conducted using AERMOD version 16216r