Intended for
St. Marys Cement Inc. (Canada)
410 Bowmanville Avenue
Bowmanville, Ontario L1C 7B5

Document type
Emission Summary and Dispersion Modelling Report

Date
November 09, 2026

Emission Summary and Dispersion Modelling Report

St. Marys Cement Inc. (Canada), Bowmanville Facility

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Emission Summary and Dispersion Modelling Report

St. Marys Cement Inc. (Canada), Bowmanville Facility

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Date	**November 09, 2026**
Prepared by	**Sejal Mistry**
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Approved by	**Xiaoxi Song**
Description	**Emission Inventory and Dispersion Modelling Report St. Marys Cement Inc. (Canada), Bowmanville Facility**

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VERSION CONTROL

Emission Summary and Dispersion Modelling Report

St. Marys Cement Inc. (Canada), Bowmanville Facility

Rev.	Date	Description	Authors
-	March 2023	ESDM Report Completed by Others	BCX Environmental Consulting
1	February 2025	ESDM updates including the following: • Updated annual stack testing data for 2023 • inclusion of quarterly raw material and fuel analyses in 2023 • updated emission inventory for baghouses and ALCF handling operations	JS/XS
2	April 2025	ESDM updates including the following: • Building on Version 1 • Updated annual stack testing data for 2024 • inclusion of quarterly raw material and fuel analyses in 2024 • Inclusion of CBM RMC plant (Hagan 4) at northwest corner of site	JS/XS
3A	March 2026	ESDM Updates including the following: • Building on Version 2 • Addition of 2 CBM Pre-mix plants (Planetary) • Inclusion of quarterly raw material and fuel analyses in 2025	JS/XS/DM
3	June 2026	ESDM updates including the following: • Building on Version 2 • Updated annual stack testing data for 2025 • Inclusion of quarterly raw material and fuel analyses in 2025 • Updated modelling using the MECP approved base model set up from ESDM Version 3A • Updated AERMOD model and meteorological data version to 24142	JS, XS, EM, DM

Rev.	Date	Description	Authors
4	November 2026	ESDM updates including the following: • Building on Versions 3/3A • Increased ALCF usage to 800 tonnes per day • Inclusion of material that is comprised of rubber (non-tire derived), including but not limited to shredded conveyor belts as an ALCF • Expanded the ALCF storage building • Replacement of the existing kiln stack with a new kiln stack • Replacement of the existing calciner with a new calciner • Inclusion of Finish Mill #4 • Inclusion of the CBM Hagan 4 and two Planetary RMC Plants • Inclusion of quarterly raw material and fuel analyses in 2025 to date	JS, XS, SM

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EXECUTIVE SUMMARY

St. Marys Cement Inc. (Canada) (SMC) operates a cement manufacturing facility at 410 Bowmanville Avenue, in Bowmanville, Ontario (Facility).

The facility is currently approved under an Environmental Compliance Approval (ECA) with Limited Operational Flexibility (LOF) No. 0550-CEAHMA, issued September 19, 2022. This version of the Emission Summary and Dispersion Modelling (ESDM) Report has been prepared in support of an application to amend an Environmental Compliance Approval (Air & Noise) (ECA) with LOF under Regulation 79/15 (Reg 79) and Regulation 419/05 (Reg 419) to:

- Increase the use of alternative low carbon fuel (ALCF) from 400 tonnes/day to 800 tonnes/day;
- Update the approved list of ALCF baskets and materials on the ECA to be:
    - Material that is biomass fuel derived from harvested plant and forest sources, end of life agricultural sources, Woodwaste or Agricultural Waste, and includes but is not limited to sawdust, wood chips, wood, miscanthus grass, millet, sorghum, hemp, switch grass, and maize;
    - Material that is comprised of non-recyclable plastics, including but not limited to manufacturing rejects, material resource recovery facility rejects, nylon (including but not limited to tire fluff), plastics bags and packaging;
    - Material that is comprised of construction, renovation & demolition waste, including but not limited to scrap wood, treated lumber, carpets, textiles, sawdust, nylon, floor laminates and asphalt shingles;
    - Material that is comprised of non-recyclable paper fiber/wood/plastic composites, including but not limited to single-serve coffee pods, printed papers, paper towels, rejects and trimmings from paper recycling facilities such as ragger tails (residue including plastic trimmings, staples, paper fibre and metal wire), end rolls and cores; and
    - Material that is comprised of rubber (non-tire derived), including but not limited to shredded conveyor belts.
- Include new equipment and increase the capacity of the ALCF storage at the facility to accommodate the increased quantity of ALCF;
- Upgrades to the calciner to accommodate increased ALCF use and a process improvement to increase combustion residence time; and
- Make environmentally insignificant changes to Schedule E of the ECA

The ESDM has also been updated to include the following proposed modifications[1] not related to ALCFs:

- Replacement of the existing kiln stack with a new kiln stack; and
- Addition of Finish Mill #4.

The report has been prepared in accordance with Section 26 of Ontario Regulation 419/05; the Ministry of the Environment, Conservation and Parks' (Ministry) Procedure for Preparing an Emission Summary and Dispersion Modelling Report (March 2018); the Ministry's Air Dispersion Modelling Guideline for Ontario (February 2017) and Basic Comprehensive Certificates of Approval (Air) User Guide (March 2011). The report includes a site-wide assessment of air emissions.

[1] These proposed modifications have been previously assessed to confirm compliance with O.Reg 419/05 and conditions of the Facility's ECA under Limited Operational Flexibility.

Description
The Facility produces Portland cement by combining materials bearing calcium carbonate, silica, alumina and iron oxide at high temperatures to produce cement clinker. The clinker is subsequently ground with finishing materials such as gypsum, limestone, and other cementitious materials (such as slag, pozzolans, and clays) to produce cement. The facility consists of the following processes and support units:

- Quarry operations - limestone extraction, processing and shipping;
- Raw material delivery, storage, processing and transfers;
- Conventional Fuels processing, storage and handling;
- Alternative Low-Carbon Fuels processing, storage and handling;
- Clinker production- cement kiln operations;
- Clinker storage and transfer; and
- Cement production including ball mills, cement storage and shipping.

In addition to the cement plant, Canada Building Materials Company (CBM), a Division of St. Marys Cement, operates one truck mix (Hagan 4) and two identical pre-mix (Planetary) ready mix concrete batching (RMC) plants under its ECA No. 7120-DPAKBM, dated March 26, 2026, at the Facility.
The Facility can operate 24 hours per day, 7 days per week and 12 months per year (except during plant shutdowns). The approved facility production limit is 2.4 million tonnes of clinker per year. This ECA currently allows for the use of up to 400 tonnes per day of alternative low carbon fuels (ALCF) as a substitute for a portion of conventional fuels in the kiln.

Assessment
The primary emissions from this Facility are particulate, nitrogen oxides, sulphur dioxide and carbon monoxide. These primary emissions along with trace amounts of metals/metal oxides and organic compounds as well as ammonia and hydrogen chloride are generated from the use/processing of raw materials and the combustion of fuel required for cement production.

Emissions of both primary and trace contaminants were estimated using a combination of published emission factors, stack test results, mass balance, and manufacturer’s performance specifications.

Maximum emissions were modelled for all contaminants using the Ministry approved US EPA AERMOD system (Version 24142), CALPUFF (Version 7.3.2, Level 200113) and site-specific meteorological data provided by the Ministry. To assess compliance, the maximum modelled Point-of-Impingement (POI) concentrations for all contaminants were compared to the standards, guidelines and screening levels in the Ministry Air Contaminants Benchmark (ACB) List, dated April 2026 and summarized in Table 1, “Emission Summary Table”.

Table 1. Emission Summary Table

Contaminant	CAS Number	Total Facility Emission Rate [g/s]		Air Dispersion Model Used	Max. POI Conc. [µg/m³](1)		MECP Limit						Percentage of MECP POI Limit [%]	
		Base	Future		Base	Future	Avg. Period Emission Rate	Avg. Period POI Concentration	Value [µg/m³]	Limiting Effect	ACB Source(2)	Category	Base	Future
Criteria Air Contaiminants														
PM	PM	9.50E+00	9.50E+00	AERMOD v24142 & CALPUFF v7.3.2	96.08	96.08	24 hr	24 hr	120	Health	S	B2	80.1%	80.1%
RCS	14263-59-3	1.69E-01	1.69E-01	AERMOD v24142 & CALPUFF v7.3.2	2.10	2.10	24 hr	24 hr	5	Health	G	B1	41.9%	41.9%
Nitrogen Oxides	10102-44-0	9.43E+01	9.43E+01	CALPUFF v7.3.2	3.56E+02	3.56E+02	1 hr	1 hr	400	Health	S	B1	89.1%	89.1%
Nitrogen Oxides	10102-44-0	9.38E+01	9.38E+01	CALPUFF v7.3.2	8.04E+01	8.04E+01	24 hr	24 hr	200	Health	S	B1	40.2%	40.2%
Sulphur Dioxide	7446-09-5	1.44E+01	1.30E+01	CALPUFF v7.3.2	5.47E+01	4.93E+01	1 hr	1 hr	100	Health & Vegetation	S	B1	54.7%	49.3%
Sulphur Dioxide	7446-09-5	1.44E+01	1.30E+01	CALPUFF v7.3.2	8.64E-01	8.44E-01	Annual	Annual	10	Health & Vegetation	S	B1	8.64%	8.44%
Carbon Monoxide	630-08-0	9.14E+01	9.14E+01	CALPUFF v7.3.2	3.46E+03	3.46E+03	1 hr	0.5 hr	6000	Health	S	B1	57.6%	57.6%
Hydrogen Chloride	7647-01-0	6.01E-01	6.49E-01	CALPUFF v7.3.2	5.14E-01	5.55E-01	24 hr	24 hr	20	Health	S	B1	2.6%	2.8%
Ammonia	7664-41-7	3.51E+00	3.51E+00	CALPUFF v7.3.2	3.00E+00	3.00E+00	24 hr	24 hr	100	Health	S	B1	3.0%	3.0%
Metals														
Antimony	7440-36-0	1.33E-05	1.33E-05	CALPUFF v7.3.2	1.85E-04	1.85E-04	24 hr	24 hr	25	Health	S	B1	<0.1%	<0.1%
Arsenic	7440-38-2	2.60E-04	2.61E-04	CALPUFF v7.3.2	1.55E-03	1.55E-03	24 hr	24 hr	0.3	Health	G	B1	0.5%	0.5%
Barium	7440-39-3	2.53E-03	2.61E-03	CALPUFF v7.3.2	2.19E-02	2.19E-02	24 hr	24 hr	10	Health	G	B1	0.2%	0.2%
Beryllium	7440-41-7	3.19E-05	3.14E-05	CALPUFF v7.3.2	1.93E-04	1.93E-04	24 hr	24 hr	0.01	Health	S	B1	1.9%	1.9%
Cadmium	7440-43-9	1.62E-05	1.62E-05	CALPUFF v7.3.2	5.51E-05	5.51E-05	24 hr	24 hr	0.025	Health	S	B1	0.2%	0.2%
Chromium	7440-47-3	2.14E-03	2.15E-03	CALPUFF v7.3.2	5.66E-02	5.66E-02	24 hr	24 hr	0.5	Health	S	B1	11.3%	11.3%
Cobalt	7440-48-4	1.27E-04	1.39E-04	CALPUFF v7.3.2	1.22E-03	1.22E-03	24 hr	24 hr	0.1	Health	G	B1	1.2%	1.2%
Iron	7439-89-6	2.21E-01	2.21E-01	CALPUFF v7.3.2	2.28E+00	2.28E+00	24 hr	24 hr	4	Health & Soiling	S	B1	57.1%	57.1%
Ferric Oxide	1309-37-1	3.16E-01	3.16E-01	CALPUFF v7.3.2	3.26E+00	3.26E+00	24 hr	24 hr	25	Health & Soiling	S	B1	13.1%	13.1%
Lead	7439-92-1	3.54E-04	3.53E-04	CALPUFF v7.3.2	2.05E-03	2.05E-03	24 hr	24 hr	0.5	Health	S	B1	0.4%	0.4%
Lead	7439-92-1	3.54E-04	3.53E-04	CALPUFF v7.3.2	7.90E-04	7.90E-04	24 hr	30 day	0.2	Health	S	B1	0.4%	0.4%
Manganese	7439-96-5	9.02E-03	9.05E-03	CALPUFF v7.3.2	8.26E-02	8.26E-02	24 hr	24 hr	0.4	Health	S	B1	20.7%	20.7%
Mercury	7439-97-6	2.54E-04	2.50E-04	CALPUFF v7.3.2	2.20E-04	2.16E-04	24 hr	24 hr	2	Health	S	B1	<0.1%	<0.1%
Nickel	7440-02-0	2.78E-03	2.62E-03	CALPUFF v7.3.2	1.15E-02	1.15E-02	Annual	Annual	0.04	Health	S	B1	28.7%	28.7%
Nickel	7440-02-0	2.78E-03	2.62E-03	CALPUFF v7.3.2	1.15E-02	1.15E-02	24 hr	Annual	0.4	Health	MECP bulletin	AAV	2.9%	2.9%
Nickel	7440-02-0	2.78E-03	2.62E-03	CALPUFF v7.3.2	6.57E-02	6.57E-02	24 hr	24 hr	2	Health	MECP bulletin	URT/DAV	3.3%	3.3%
Selenium	7782-49-2	2.30E-04	2.13E-04	CALPUFF v7.3.2	2.16E-04	2.11E-04	24 hr	24 hr	10	Health	G	B1	<0.1%	<0.1%
Silver	7440-22-4	4.00E-05	4.13E-05	CALPUFF v7.3.2	1.46E-04	1.46E-04	24 hr	24 hr	1	Health	S	B1	<0.1%	<0.1%
Tin	7440-31-5	1.40E-04	1.40E-04	CALPUFF v7.3.2	2.17E-03	2.17E-03	24 hr	24 hr	10	Health	S	B1	<0.1%	<0.1%
Vanadium	7440-62-2	1.04E-03	1.02E-03	CALPUFF v7.3.2	8.55E-03	8.55E-03	24 hr	24 hr	2	Health	S	B1	0.4%	0.4%
Volatile Organic Matter														
Acetaldehyde	75-07-0	5.46E-01	5.46E-01	CALPUFF v7.3.2	5.48E+00	5.48E+00	0.5 hr	0.5 hr	500	Health	S	B1	1.1%	1.1%
Acrolein	107-02-8	5.78E-02	5.78E-02	CALPUFF v7.3.2	4.94E-02	4.94E-02	24 hr	24 hr	0.4	Health	S	B1	12.4%	12.4%
Acrolein	107-02-8	5.78E-02	5.78E-02	CALPUFF v7.3.2	4.78E-01	4.78E-01	1 hr	1 hr	4.5	Health	S	B1	10.6%	10.6%
Benzene	71-43-2	2.32E-01	2.32E-01	CALPUFF v7.3.2	7.33E-03	7.33E-03	Annual	Annual	0.45	Health	S	B1	1.6%	1.6%
Benzene	71-43-2	2.32E-01	2.32E-01	CALPUFF v7.3.2	7.33E-03	7.33E-03	24 hr	Annual	4.5	Health	MECP bulletin	AAV	0.2%	0.2%
Benzene	71-43-2	2.32E-01	2.32E-01	CALPUFF v7.3.2	1.98E-01	1.98E-01	24 hr	24 hr	100	Health	MECP bulletin	URT/DAV	0.2%	0.2%
1,3-Butadiene	106-99-0	6.73E-02	6.73E-02	CALPUFF v7.3.2	2.13E-03	2.13E-03	Annual	Annual	2	Health	S	B1	0.1%	0.1%
1,3-Butadiene	106-99-0	6.73E-02	6.73E-02	CALPUFF v7.3.2	2.13E-03	2.13E-03	24 hr	Annual	20	Health	MECP bulletin	AAV	<0.1%	<0.1%
1,3-Butadiene	106-99-0	6.73E-02	6.73E-02	CALPUFF v7.3.2	5.76E-02	5.76E-02	24 hr	24 hr	300	Health	MECP bulletin	URT/DAV	<0.1%	<0.1%
Carbon tetrachloride	56-23-5	8.60E-03	9.28E-03	CALPUFF v7.3.2	7.35E-03	7.94E-03	24 hr	24 hr	2.4	Health	S	B1	0.3%	0.3%
Chloroform	67-66-3	1.28E-02	1.39E-02	CALPUFF v7.3.2	1.10E-02	1.19E-02	24 hr	24 hr	1	Health	S	B1	1.1%	1.2%
Dibromochloromethane	124-48-1	9.09E-03	9.82E-03	CALPUFF v7.3.2	7.78E-03	8.40E-03	24 hr	24 hr	0.2	Health	SL-JSL	B2	3.9%	4.2%
1,2-Dichloroethane	107-06-2	8.60E-03	9.28E-03	CALPUFF v7.3.2	7.35E-03	7.94E-03	24 hr	24 hr	2	Health	S	B1	0.4%	0.4%
Ethylene dibromide	106-93-4	6.89E-03	6.89E-03	CALPUFF v7.3.2	5.89E-03	5.89E-03	24 hr	24 hr	3	Health	G	B1	0.2%	0.2%
Ethylene glycol	107-21-1	6.00E-01	6.00E-01	CALPUFF v7.3.2	1.07E+01	1.07E+01	24 hr	24 hr	12700	Health	G	B1	<0.1%	<0.1%
Phenol	108-95-2	2.50E+00	2.50E+00	CALPUFF v7.3.2	2.14E+00	2.14E+00	24 hr	24 hr	30	Health	S	B1	7.1%	7.1%
Propionaldehyde	123-38-6	8.79E-02	8.79E-02	CALPUFF v7.3.2	1.20E+00	1.20E+00	10 min	10 min	10	Odour	G	B1	12.0%	12.0%
1,1,1,2-Tetrachloroethane	630-20-6	8.60E-03	9.28E-03	CALPUFF v7.3.2	7.35E-03	7.94E-03	24 hr	24 hr	0.5	Health	SL-JSL	B2	1.5%	1.6%
1,1,2,2-Tetrachloroethane	79-34-5	9.09E-03	9.82E-03	CALPUFF v7.3.2	7.78E-03	8.40E-03	24 hr	24 hr	0.1	Health	SL-JSL	B2	7.8%	8.4%
Vinyl chloride	75-01-4	2.55E-02	2.76E-02	CALPUFF v7.3.2	2.18E-02	2.36E-02	24 hr	24 hr	1	Health	S	B1	2.2%	2.4%
Polycyclic Aromatic Hydrocarbons (PAHs)														
Benzo(a)pyrene	50-32-8	1.05E-06	1.05E-06	CALPUFF v7.3.2	3.32E-08	3.32E-08	Annual	Annual	0.00001	Health	S	B1	0.3%	0.3%
Benzo(a)pyrene	50-32-8	1.05E-06	1.05E-06	CALPUFF v7.3.2	3.32E-08	3.32E-08	24 hr	Annual	0.0001	Health	MECP bulletin	AAV	<0.1%	<0.1%
Benzo(a)pyrene	50-32-8	1.05E-06	1.05E-06	CALPUFF v7.3.2	8.98E-07	8.98E-07	24 hr	24 hr	0.005	Health	MECP bulletin	URT/DAV	<0.1%	<0.1%
Naphthalene	91-20-3	7.40E-02	7.40E-02	CALPUFF v7.3.2	6.33E-02	6.33E-02	24 hr	24 hr	22.5	Health Odour	G	B1	0.3%	0.3%
Naphthalene	91-20-3	7.40E-02	7.40E-02	CALPUFF v7.3.2	1.01E+00	1.01E+00	10 min	10 min	50	Health Odour	G	B1	2.0%	2.0%

Notes:

(1) ACB Source: "S" - Standard (for Section 20), "G" - Guideline (for Section 20), "SL-JSL" - Screening Level (SL) set by the MECP based on a review of toxicity information and/or other jurisdictional levels (JSL), "SL-PA" - Screening Level - Previously Accepted, "SL-MD" - Screening Level - Ministry Derived.

(2) PM - Particulate matter, RCS - respirable crystalline silica

(3) Category: B1 (Benchmark 1) - Exceedence of a B1 concentration triggers specific actions under O. Reg. 419/05 and is an offence under O. Reg. 1/17.
B2 (Benchmark 2) - Exceedence of a B2 concentration, or if no B2 value exists, triggers a toxicological assessment to determine the likelihood of adverse effect.

DAV and AAV: "DAV" - Daily Assessment Value to be compared against maximum 24-hr POI concentration, "AAV" - Annual Assessment Value to be compared against maximum annual POI concentration but assuming peak 24-hr average emission rate occurs every day in the year, as per MECP technical bulletin: "Using assessment values for contaminants with annual air standards".

URT = Upper Risk Threshold. URTs listed in Schedule 6 of O. Reg. 419/05 are not standards. URTs have separate and distinct regulatory and notification requirements. These requirements are set out in section 30 of O. Reg. 419/05.

(4) Base Case - Maximum usage of ALCF of 400 tonnes per day, Future Case - Maximum usage of ALCF of 800 tonnes/day.

Ontario

Ministry of the Environment, Conservation and Parks

Emission Summary and Dispersion Modelling Report Checklist

Company Name

St. Marys Cement Inc. (Canada)

Company Address

Unit Number	Street Number	Street Name	PO Box
	55	Industrial Street	

City/Town	Province	Postal Code
Toronto	Ontario	M4G 3W9

Location of Facility

410 Bowmanville Avenue, Bowmanville, Ontario L1C 7B5

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with s. 26 of O. Reg. 419/05 and the guidance in the MECP document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009 and "Air Dispersion Modelling Guideline for Ontario" dated March 2009 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17.

Company Contact

Ruben Plaza

Company Contact Name

Last Name	First Name	Middle Initial
Plaza	Ruben	

Title	Telephone Number
Corporate Environmental Manager	905-623-3341

Signature	Date (yyyy/mm/dd)
[redacted]	

Technical Contact

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17.

Technical Contact

Xiaoxi Song, M.Sc., P.Eng.

Technical Contact Name

Last Name	First Name	Middle Initial
Song	Xiaoxi	

Representing	Telephone Number
Ramboll Canada Inc.	289-290-0627

Signature	Date (yyyy/mm/dd)
[redacted]	

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* This checklist is taken from the document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009.

Emission Summary and Dispersion Modelling Report Checklist

	Required Information	Submitted	Explanation/Reference
	Executive Summary and Emission Summary Table		
	1.1 Overview of ESDM Report	☑ Yes	Executive Summary
	1.2 Emission Summary Table	☑ Yes	Table 1
1.0	**Introduction and Facility Description**		
	1.1 Purpose and Scope of ESDM Report (when report only represents a portion of facility)	☑ Yes	Section 1.1
	1.2 Description of Processes and NAICS code(s)	☑ Yes	Section 1.2
	1.3 Description of Products and Raw Materials	☑ Yes	Section 1.3
	1.4 Process Flow Diagram	☑ Yes	Section 1.4, Appendix B
	1.5 Operating Schedule	☑ Yes	Section 1.5
2.0	**Initial Identification of Sources and Contaminants**		
	2.1 Sources and Contaminants Identification Table	☑ Yes	Section 2
3.0	**Assessment of the Significance of Contaminants and Sources**		
	3.1 Identification of Negligible Contaminants and Sources	☑ Yes	Section 3, Appendix A & C
	3.2 Rationale for Assessment	☑ Yes	Section 3
4.0	**Operating Conditions, Emission Rate Estimating and Data Quality**		
	4.1 Description of operating conditions, for each significant contaminant that results in the maximum POI concentration for that contaminant	☑ Yes	Section 4.1
	4.2 Explanation of Method used to calculate the emission rate for each contaminant	☑ Yes	Section 4.2
	4.3 Sample calculation for each method	☑ Yes	Appendix E
	4.4 Assessment of Data Quality for each emission rate	☑ Yes	Appendix E
5.0	**Source Summary Table and Property Plan**		
	5.1 Source Summary Table	☑ Yes	Section 5, Appendix A
	5.2 Site Plan (scalable)	☑ Yes	Section 5, Appendix B
6.0	**Dispersion Modelling**		
	6.1 Dispersion Modelling Input Summary Table	☑ Yes	Appendix D, Table D1
	6.2 Land Use Zoning Designation Plan	☑ Yes	Appendix B, Figure B3
	6.3 Dispersion Modelling Input and Output Files	☑ Yes	Email Link
7.0	**Emission Summary Table and Conclusions**		
	7.1 Emission Summary Table	☑ Yes	Appendix A, Table A4
	7.2 Assessment of Contaminants with no MECP POI Limits	☑ Yes	N/A
	7.3 Conclusions	☑ Yes	Section 7
	Appendices (Provide supporting information or details such as…)		
	A: Tables; B: Figures; C: Negligible Sources and Contaminants	☑ Yes	Appendix A-C
	D: Dispersion Modelling; E: Emission Estimates	☑ Yes	Appendix D-E
	F: Stack Test Results and Material Composition; G: Section 13 and 7 Notices; H: Supporting Documentation	☑ Yes	Appendix F-H

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1. Introduction and Facility Description

St. Marys Cement Inc. (Canada) (SMC) operates a cement manufacturing facility at 410 Bowmanville Avenue, in Bowmanville, Ontario (Facility). The facility is currently approved under an Environmental Compliance Approval (ECA) with Limited Operational Flexibility (LOF) No. 0550-CEAHMA, issued September 19, 2022.

The Facility produces Portland cement by combining materials bearing calcium carbonate, silica, alumina and iron oxide at high temperatures to produce cement clinker. The clinker is subsequently ground with finishing materials such as gypsum, limestone, and other cementitious materials (such as slag, pozzolans, and clays) to produce cement. The facility consists of the following processes and support units:

- Quarry operations - limestone extraction, processing and shipping;
- Raw material delivery, storage, processing and transfers;
- Conventional Fuels processing, storage and handling;
- Alternative Low-Carbon Fuels processing, storage and handling;
- Clinker production- cement kiln operations;
- Clinker storage and transfer; and
- Cement production including ball mills, cement storage and shipping.

In addition to the cement plant, Canada Building Materials Company (CBM), a Division of St. Marys Cement, operates one truck mix (Hagan 4) and two identical pre-mix (Planetary) ready mix concrete batching (RMC) plants under its ECA No. 7120-DPAKBM, dated March 26, 2026, at the Facility.

The Facility can operate 24 hours per day, 7 days per week and 12 months per year (except during plant shutdowns). The approved facility production limit is 2.4 million tonnes of clinker per year. This ECA currently allows for the use of up to 400 tonnes per day of alternative low carbon fuels (ALCF) as a substitute for a portion of conventional fuels in the kiln.

The site plans of the Facility are provided in Figures B2-A to B2-E, Appendix B, and the corresponding zoning information is documented in Figure B3, Appendix B.

1.1 Purpose and Scope of ESDM Report

This version of the Emission Summary and Dispersion Modelling (ESDM) Report has been prepared in support of an application to amend an Environmental Compliance Approval (Air & Noise) (ECA) with LOF under Regulation 79/15 (Reg 79) and Regulation 419/05 (Reg 419) to:

- Increase the use of alternative low carbon fuel (ALCF) from 400 tonnes/day to 800 tonnes/day;
- Update the approved list of ALCF baskets and materials on the ECA to be:
    - Material that is biomass fuel derived from harvested plant and forest sources, end of life agricultural sources, Woodwaste or Agricultural Waste, and includes but is not limited to sawdust, wood chips, wood, miscanthus grass, millet, sorghum, hemp, switch grass, and maize;
    - Material that is comprised of non-recyclable plastics, including but not limited to manufacturing rejects, material resource recovery facility rejects, nylon (including but not limited to tire fluff), plastics bags and packaging;

  - Material that is comprised of construction, renovation & demolition waste, including but not limited to scrap wood, treated lumber, carpets, textiles, sawdust, nylon, floor laminates and asphalt shingles;
  - Material that is comprised of non-recyclable paper fiber/wood/plastic composites, including but not limited to single-serve coffee pods, printed papers, paper towels, rejects and trimmings from paper recycling facilities such as ragger tails (residue including plastic trimmings, staples, paper fibre and metal wire), end rolls and cores; and
  - Material that is comprised of rubber (non-tire derived), including but not limited to shredded conveyor belts.
- Include new equipment and increase the capacity of the ALCF storage at the facility to accommodate the increased quantity of ALCF;
- Upgrades to the calciner to accommodate increased ALCF use and a process improvement to increase combustion residence time; and
- Make environmentally insignificant changes to Schedule E of the ECA

The ESDM has also been updated to include the following proposed modifications[2] not related to ALCFs:

- Replacement of the existing kiln stack with a new kiln stack; and
- Addition of Finish Mill #4.

This report has been prepared in accordance with Section 26 of Ontario Regulation 419/05; the Ministry of the Environment, Conservation and Parks' (Ministry) Procedure for Preparing an Emission Summary and Dispersion Modelling Report (March 2018); the Ministry's Air Dispersion Modelling Guideline for Ontario (February 2017) and Basic Comprehensive Certificates of Approval (Air) User Guide (March 2011). The report includes all air emissions from the site.

1.2 Description of NAICS Code(s)

The NAICS codes that best describe the processes at the facility is 327310, "Cement Manufacturing"

1.3 Description of Processes, Raw Materials and Products

1.3.1 Limestone Extraction

The simplified process flow diagram of the limestone extraction process is included in Figure B1-A in Appendix B.

Limestone is extracted from the quarry by blasting various limestone benches. Explosive holes are drilled along the blast face. No other operations take place inside the quarry during blasting. Front-end loaders transfer the fragmented stone from the blast face into mining trucks. The fragmented stone is transported either to the Facility's underground primary crusher which feeds the primary surge pile for the Facility or to the construction grade limestone stockpile.

1.3.2 Construction Grade Limestone Processing

The simplified process flow diagram of the construction grade limestone processing methodology is included in Figure B1-C in Appendix B.

[2] These proposed modifications have been previously assessed to confirm compliance with O.Reg 419/05 and conditions of the Facility's ECA under Limited Operational Flexibility.

The composition of limestone extracted from the quarry varies with depth and location. A portion of the extracted limestone is sorted, processed and transferred offsite by CBM Aggregates.

CBM Aggregates operates one front-end loader, and a portable crushing plant consisting of one primary crusher and one secondary crusher/screen below grade in the quarry. Construction grade limestone from the construction grade storage pile in the quarry is transferred by a front-end loader into CBM's primary crusher. From this point material is conveyed to CBM's secondary crusher/screen and to the product stockpiles by conveyors. The limestone is crushed into different material sizes.

The processed materials are transported by haul trucks to the storage yard outside the quarry on the west side of the cement plant. In the CBM storage yard, a front-end loader transfers the aggregate materials onto different product piles via a stacker that is powered by a diesel generator.

1.3.3 Cement Manufacturing Operations

The cement plant produces Portland cement by combining materials bearing calcium carbonate, silica, alumina and iron oxide at high temperatures to produce cement clinker. The clinker is subsequently ground with finishing materials such as gypsum, limestone, and other cementitious materials (such as slag, pozzolans, and clays) to produce cement. The major processes are described in the sections below, are colour coded to match the figures and tables within this report.

The simplified process flow diagram of the cement manufacturing operations is included in Figure B1-B in Appendix B.

1.3.3.1 Raw Material/Conventional Fuel Delivery and Storage

Processed limestone is fed via enclosed conveyors to one of eight raw material storage silos.

Other raw materials (e.g. sand, alumina, iron oxide overburden and ash) are delivered by truck, and as appropriate, are stored in silos or stockpiles. Additives (gypsum) and solid fuels (i.e. petroleum cokes and coal) are primarily delivered by ship and are transported by truck to the plant from the dock. SMC's material/conventional fuel storage and handling operations at the dock area are approved under ECA No. 6346-9DSL5P, dated December 5, 2013.

1.3.3.2 ALCF Delivery and Storage

The facility is requesting an amendment to consume up to 800 tonnes of ALCF per day. To accommodate the increased quantity of ALCF, the ALCF storage building will be expanded and fully enclosed new feed systems will be installed (See Figure B2-C in Appendix B).

ALCFs are transported to the Facility in enclosed trucks and/or trailers. To minimize potential for fugitive emissions from the unloading of the ALCFs once received at the Facility, delivered ALCF material are unloaded directly from the truck inside the ALCF building. The doors of the ALCF building will remain sealed during all ALCF delivery and unloading activities. ALCF materials are transferred by a front-end loader into the ALCF feed system inside the ALCF building.

1.3.3.3 Raw Material Preparation

Raw materials (i.e. limestone, sand, alumina, iron oxide, overburden and ash) are fed in controlled proportions from the raw material storage silos and storage building via an enclosed conveyor belt system to a raw mill. In the raw mill, the raw materials are ground and mixed to control particle

size distribution and are dried using the hot exhaust gases from the pre-heater tower/kiln system. The dried raw meal is stored in the kiln feed silo (CF silo) which is controlled by a baghouse.

Emissions from the raw mill are controlled by the main baghouse which vents through the kiln stack.

1.3.3.4 Solid Conventional Fuel Preparation and Feed System

Solid conventional fuel for the kiln system is fed to the fuel mill from the storage silos. Emissions are controlled by the fuel mill baghouse which vents through the main kiln stack. Milled fuel (fuel meal) is pneumatically fed to the main kiln burner or calciner burner through their individual fuel feed systems (i.e. two fuel meal silos and dust collectors).

When ALCF is used, the homogenized fuel from the ALCF fuel building is transferred via a series of conveyors that feed the calciner and the kiln.

The ALCF feed system is fully integrated with the plant control system to regulate and limit the fuel substitution rates into the calciner and kiln to maintain the required temperature profile and system conditions. ALCF is not to be used during kiln start-up or shut down.

1.3.3.5 Clinker Production

Calcination (Preheater Tower and Kiln)

The ground, mixed and dried raw material (raw meal) is fed, via air slides and bucket elevators, up to a dual string pre-heater tower consisting of a series of cyclones. As the raw meal progressively passes through a pre-heater string and its cyclones, it is preheated using the hot gases from the calciner/kiln prior to being directed into the calciner/kiln. The counterflow of the flue gases relative to the raw meal as it travels toward the kiln, together with the raw mill, acts as a "dry scrubber" to remove acidic gases from the gas stream.

Prior to being directed into the kiln, the pre-heated material is fed into a calciner. [redacted]

The rotation speed of the kiln is controlled to gradually move the raw materials towards the burning zone/backend which provides a long residence time ensuring complete combustion/calcination.

The chemical reactions and physical processes under high temperatures and with a long residence time transform the raw meal into clinker inside the cement kiln. The high temperatures, long residence times and the oxidizing atmosphere in the kiln system result in the complete destruction of the organic components of the solid fuels and raw materials. The clinker formed inside the kiln retains the majority of the inorganic components of the fuels and raw materials including heavy metals.

Under normal operating conditions, [redacted] of the flue gases from the kiln pass through the pre-heater strings and raw mill, while the [redacted] of the kiln flue gases is directed to the bypass system (i.e. "bypassing" the preheater strings and the raw mill). The purpose of the bypass system is to remove fines containing volatiles (e.g. chlorides and sulphur) and alkalis (e.g. sodium and potassium oxides) from the kiln system to comply with the concrete ASTM and CSA standards.

Flue gases from both the pre-heater strings and the bypass system are cooled by water sprays in the downcomers before being treated by the kiln baghouse and the bypass system baghouse, respectively, for particulate control. The temperature of the flue gases is rapidly reduced to 200°C to prevent the formation of organics in the 200°C-400°C temperature range.

The Facility also uses a Selective Non-Catalytic NOx Reduction (SNCR) ammonia solution injection system to reduce NOx emissions from the kiln stack and a wet scrubber to reduce SO2 emissions.

The main baghouse, bypass baghouse, and the fuel mill baghouse are comingled and exhaust to the atmosphere via the main kiln stack.

[redacted]

Process Condition and Emissions Monitoring for the Kiln System

The process parameters including burning zone temperature, residence time and residual oxygen in the kiln/calciner and pressure differential in the kiln/calciner, preheater tower and raw mill are monitored through the Facility's continuous process monitoring system (CPM) to maintain optimal process conditions and product quality, as well as to meet the operational requirements set out in Schedule E of the ECA when ALCF is used. Raw material, conventional fuel, and ALCF feed rates and clinker production rates are also monitored by the CPM.

In addition, the Facility uses a continuous emissions monitoring (CEM) system to monitor kiln stack emissions including nitrogen oxides (NO_x), sulphur dioxide (SO_2) and total particulate matter (TPM) at all times.

Clinker Cooling

The clinker product is cooled by passing ambient air across the product in the clinker cooler. Part of this pre-heated air is then directed into the kiln for use as combustion air. The air passes through the clinker cooler baghouse prior to being exhausted to the atmosphere through the cooler stack.

Clinker exits the clinker cooler [redacted] onto an enclosed conveyor system, which feeds one of five clinker storage silos. Cooled clinker from the clinker storage silos is conveyed to the roller press where it is pre-ground. Pre-ground clinker is then transferred into the cement finish mill feed silos. All clinker storage silos are controlled by baghouses.

[redacted]

1.3.3.6 Cement Production

Cement finishing is accomplished in four individual ball grinding mills. Clinker, limestone, gypsum and/or other cementitious materials (such as slag, pozzolans, and clays) are milled together to produce cement. The four finish mills are controlled by individual baghouses venting through three finish mill stacks. The finished cement product is transferred into product storage silos. Product can be dispatched via tanker truck or by ship.

In addition to finished cement product, the plant also ships clinker. Cement and clinker are transported to the dock using an enclosed conveyor system. All clinker and cement product storage silos are controlled by baghouses.

1.3.3.7 Other Associated Equipment/Operations

At the SMC cement plant, ancillary operations include:

- Propane fired comfort heating units;
- Three (3) emergency diesel generator;
- Maintenance shop; and
- Eight (8) QA/QC laboratory fume hoods.

1.3.4 Ready-Mix Concrete Operations

CBM operates one truck mix (Hagan 4) and two identical pre-mix (Planetary) ready mix concrete batching (RMC) plants under its ECA No. 7120-DPAKBM, dated March 26, 2026, at the Facility. This ESDM, therefore, only includes emissions from the RMC plants as described below.

The RMC Plants produce ready-mix concrete by combining aggregate materials, Portland Cement, supplementary cementitious materials (SCMs), and aqueous admixtures. The RMC Plants consist of the following processes and support units:

- raw materials storage and handling;
- ready-mix concrete storage and shipping; and
- baghouses to control dust emissions.

The process flow diagrams of the Ready-Mix Concrete operations are included in Figure B1-E in Appendix B.

1.3.4.1 Hagan 4 Plant (Truck Mix)

Bulk materials such as limestone, gravel, and sand are transported to the site via trucks and are stored in the Plant's aggregate stockpiles, which are surrounded by concrete block walls on three sides. These materials are then transferred from the stockpiles to an aggregate hopper by a front-end loader.

The hopper feeds into an inclined conveyor, which deposits the aggregate materials into elevated storage bins. From these bins, the aggregate materials are gravity fed onto the aggregate weigh scale.

Portland Cement and SCMs are received by tanker truck and are stored in two silos. Portland Cement is supplied by the Cement Plant. Each silo is equipment with a pulse-jet type baghouse dust collector controlling dust emissions from silo loading. When needed, Portland Cement and SCMs are transferred to the cement weigh scale through an air slide.

Aggregate materials, transferred from the aggregate weigh scale by a conveyor along with Portland Cement and SCMs from the cement weigh scale, are both deposited straight into the ready-mix truck where it is mixed with water and aqueous admixtures. The truck loading point is surrounded by three walls and a roof. Dust emissions originating from the cement weigh scale, and the loading point are managed by the loading point baghouse dust collector.

During the winter months the water used for ready mix batching is heated by an electric boiler to raise the temperature of the mix. During the summer months, liquid nitrogen stored in an onsite storage tank is used to cool the mix in the truck before leaving the site.

Since the Hagan 4 Plant is powered by the electrical grid, no combustion emissions are expected.

Other operations/activities associated with the Hagan 4 Plant include:

- Maintenance activities;
- Onsite vehicle fuelling and storage tanks;
- Vehicles travelling on onsite roads; and
- Wind erosion from stockpiles and aggregate conveying.

1.3.4.2 Planetary RMC Plants (Pre-Mix)

CBM also operates two identical pre-mix style RMC plants (Planetary) on the site. Only one plant will operate at a time with the second plant acting as a back-up plant to eliminate downtime.

Bulk materials such as limestone, gravel, and sand will be transported to the site via trucks and stored in Planetary's aggregate stockpiles, which will be surrounded by concrete block walls on three sides. These materials will then be transferred from the stockpiles directly into elevated aggregate bins at one of the two Planetary Plants by a front-end loader. From these bins, the aggregate materials are gravity fed onto the aggregate weigh scale.

Portland Cement and SCMs are received by tanker truck and stored in three silos (2 vertical silos and 1 horizontal "in-truss' silo). Portland Cement is supplied by the Cement Plant. The two vertical silos are equipped with pulse-jet type baghouse dust collectors controlling dust emissions from silo loading. The horizontal silo is equipped with a shaker-type baghouse dust collector. When needed, Portland Cement and SCMs are transferred to the weigh scale through an air slide.

Bulk material, Portland Cement, and SCMs are transferred from the cement weigh scale by covered conveyor and auger, respectively, to the central mixer located in an enclosed building. These materials are then mixed with water and aqueous admixtures. Dust emissions originating from the central mixer and its enclosure are managed by a dust collector. The central mixer is located directly above the loading point, which is enclosed by three walls and a roof.

During the winter months the water used for ready mix batching is heated by an electric boiler to raise the temperature of the mix. During the summer months, liquid nitrogen stored in an onsite storage tank is used to cool the mix in the truck before leaving the site.

Since the Planetary RMC plants are powered by the electrical grid, no combustion emissions are expected.

Other operations/activities associated with the Planetary RMC Plants include:

- Maintenance activities;
- Onsite vehicle fuelling and storage tanks;
- Vehicles travelling on onsite roads; and
- Wind erosion from stockpiles and aggregate conveying.

1.4 Process Flow Diagrams

Process flow diagrams for the SMC operations are provided in Figures B1-A to B1-E, respectively (Appendix B).

1.5 Operating Schedule

The Facility typically operates 24 hours per day, 7 days per week, and 12 months per year (except during plant shutdowns).

1.6 Facility Production Limit

The approved facility production limit is 2.4 million tonnes of clinker per year. The currently approved limit for the use of alternative low carbon fuels (ALCF), as defined in the ECA, as a substitute for a portion of conventional fuels in the kiln is 400 tonnes per day.

The Facility requests to increase the limit for the use of ALCF to 800 tonnes per day.

1.7 Summary of Equipment and Operations for which Approval is Sought

This ESDM Report provides a full site-wide emission inventory and air dispersion modelling assessment for the site.

SMC would like to amend their ECA (air) to:

- Increase the maximum consumption rate of ALCF from 400 tonnes/day to 800 tonnes/day;
- Update the list of Polycyclic Organic Matter under Schedule G to include only Benzo(a)pyrene and Naphthalene.
- Update the approved list of ALCF baskets and materials on the ECA to be:
    - Material that is biomass fuel derived from harvested plant and forest sources, end of life agricultural sources, Woodwaste or Agricultural Waste, and includes but is not limited to sawdust, wood chips, wood, miscanthus grass, millet, sorghum, hemp, switch grass, and maize;
    - Material that is comprised of non-recyclable plastics, including but not limited to manufacturing rejects, material resource recovery facility rejects, nylon (including but not limited to tire fluff), plastics bags and packaging;

- Material that is comprised of construction, renovation & demolition waste, including but not limited to scrap wood, treated lumber, carpets, textiles, sawdust, nylon, floor laminates and asphalt shingles;
- Material that is comprised of non-recyclable paper fiber/wood/plastic composites, including but not limited to single-serve coffee pods, printed papers, paper towels, rejects and trimmings from paper recycling facilities such as ragger tails (residue including plastic trimmings, staples, paper fibre and metal wire), end rolls and cores; and
- Material that is comprised of rubber (non-tire derived), including but not limited to shredded conveyor belts.

SMC would also like to amend Schedule E of their ECA (air) to the following:

Parameter	**Limits**	**Measurement**
Total Quantity of Alternative Low-Carbon Fuels combusted in the Cement Kiln	800 tonnes per day	Measured continuously and summed daily.
Temperature in the Cement Kiln (in order to commence introduction of ALCF's)	Greater than 1000 Deg. C in the kiln. Greater than 850 Deg. C in the calciner.	As demonstrated by the CPM System measuring the temperature of the gases at the K5 cyclone upstream of the kiln where the gas temperature reaches a minimum of 800 Deg C. As demonstrated by the CPM System. Calculated as a rolling 1-hour arithmetic average measured by the CPM System with a minimum combined uptime of 90%.
Residual Oxygen (in order to commence introduction of ALCF's)	>1% residual oxygen at the backend (raw material feed end) of the kiln. >3% residual oxygen at the calciner down corner duct (raw material feed end of the calciner).	Measured by the CPM System and calculated by volume on a dry basis in the undiluted gases leaving the kiln and calciner. Calculated as a rolling 1-hour arithmetic average measured by the CPM System with a minimum combined uptime of 90%.
Pressure Control (in order to commence introduction of ALCF's)	Kiln, Calciner, Preheater tower and Raw Mill must be operated under negative pressure at all times.	Measured at the top of the preheater towers and in Raw Mill by continuous monitor. Calculated as a tolling 4-hour arithmetic average measured by the CPM System with a minimum uptime of 90%.
Start-Up, Shut-Down and Upset Operating Conditions	No Alternative Low-Carbon Fuels shall be used.	-

2. Initial Identification of Sources and Contaminants

All sources and contaminants at the facility are identified in Table A1, Sources and Contaminants Identification table.

3. Assessment of the Significance of Sources and Contaminants

Some sources/contaminants at the facility have been deemed insignificant, and these sources/ contaminants are listed in Appendix C. The rationale for defining these sources/contaminants as insignificant is presented in this section.

3.1 Identification of Sources Exempt from Requiring an ECA (Air & Noise)

Section 9 (3) of the Environmental Protection Act identifies equipment and operations which are exempt from requiring an ECA (Air & Noise). Item (a) identifies routine maintenance carried out on any plant, structure, equipment, apparatus, mechanism or thing to be exempt. Maintenance shop activities at the Facility are, therefore, considered exempt.

3.2 Identification of Negligible Sources

In accordance with Table B-3A of the MECP procedure document, the following were assumed negligible:

- Liquid nitrogen tank (Source RMC-N2);
- Laboratories fume hoods are used for quality control and quality assurance purposes (Source QAQC); and
- Chemical storage room ventilation, which emits contaminants in negligible amounts. Admixtures are typically non-volatile aqueous solutions (Source RMC-AD).

Sources that are Insignificant Relative to Total Emissions

SMC performs routine testing on the emergency diesel generators one at a time. The nitrogen oxide emissions from emergency diesel generator testing are negligible (i.e. less than 5% of the total site-wide emissions). Therefore, Sources EDGPH, EDGKILN and EDGPLANT were considered negligible in accordance with Section 7.2.2 of the Ministry procedure document. Details of the emission calculations are presented in Calculation Sheet 5 (Appendix E).

3.3 Identification of Negligible Contaminants

Combustion of Propane

SMC's heaters (HUTT, MAINSH, LUNCHR-1, LUNCHR-2, FMHEAT, and QGARAGE), at the facility are propane-fired. Section 7.1.1 of the Ministry Procedure Document identifies that "The significant contaminant from the combustion of natural gas and propane may be nitrogen oxides. Other contaminants, for this type of source are generally emitted in negligible amounts". As such, only emissions of nitrogen oxides are calculated for these sources.

Contaminants Below an Emission Threshold

Section 7.1.2 of the Ministry Procedure Document states that contaminants can be considered insignificant if the emissions from the site using the distance to the property line from the closest

emission source is less than the emission threshold developed with the Emission Threshold formula below.

$$\text{Emission Threshold (g/s)} = \frac{0.5 \times \text{Ministry POI Limit or JSL } [\mu g/m^3]}{\text{Dispersion Factor } [\mu g/m^3 \text{ per g/s emission}]}$$

The Emission Threshold screening exercise was performed for contaminants that have a 10-minute, half hour, 1-hour, and/or 24-hour POI limit, and that are solely emitted from the kiln stack.

The negligible contaminant screening calculation was completed for the kiln stack as presented in Table C1.

3.4 Fugitive Dust Emissions

As identified in Table 7-3 of the Ministry procedure document, Cement Manufacturing (NAICS Code 327310) is an industry sector where Metals in Fugitive Particulate is Generally Not Anticipated is generally not expected to contain significant quantities of metals or other contaminants with health-based POI limits in the dust. Nevertheless, fugitive particulate (suspended particulate matter) from onsite roadways and storage piles must be included in the ESDM report unless the facility:

- develops and implements a Best Management Practices plan (BMPP) and a copy of this plan is included as an Appendix H to the ESDM report;
- retains a copy of the BMPP and appropriate implementation records on-site for inspection by the ministry; and,
- demonstrates that each contaminant that has a health-based ministry POI Limit (or that may cause health effects) has been adequately assessed in the ESDM report and any issues have been addressed.

Per Condition 13 of their ECA, SMC has developed and implemented a BMPP for fugitive particulate at this site in accordance with Ministry's Technical Bulletin; therefore, fugitive sources of dust from travel along onsite roadways and wind erosion of storage piles are, considered insignificant at this site.

4. Operating Conditions, Emissions Estimates, and Data Quality

4.1 Maximum Emissions Scenarios

Two maximum emission scenarios, base and future, have been assessed for this ESDM as described below. The Facility production limit is 2.4 million tonnes of clinker per year, [redacted]

Base Scenario (Non-ALCF Related Modifications):

- [redacted] with a maximum ALCF substitution rate of 400 tonnes/day

Future Scenario (ALCF and Non-ALCF Related Modifications):

- [redacted] with a maximum ALCF substitution rate of 800 tonnes/day with the inclusion of rubber as an ALCF

The base scenario also includes the non-ALCF related modifications previously assessed, while the future scenario is built on the base case and includes the ALCF related modifications as described below.

Emission calculations and dispersion modelling to determine maximum POI concentration were based on the facility's maximum raw material handling and production capacities and operating schedules for all on-site activities during normal operation, as summarized in Table A2.

4.2 Emission Estimates

Details of the emission calculations and data quality for each source are given in Appendix E, and the general methodology is given below.

[redacted]

With respect to the kiln stack, as detailed in Calculation Sheets E1A and E1 of Appendix E, the emission rates for the two maximum emission scenarios are determined as follows:

Trace metals, SO_2 and chlorinated compounds from the KILN stack:

The emissions of the two maximum emissions scenarios were scaled based on the kiln mass input of each contaminant using the most recent 2025 stack test results (see Appendix F) and kiln mass input of each contaminant during the 2025 test as the base. The scaling of emissions for SO_2 and chlorinated compounds was calculated based on the sulphur and chlorine input, respectively. A comparison of kiln mass inputs for the maximum emission scenarios is presented in Calculation Sheet E1A in Appendix E.

Total suspended particulate, NO_X, CO, and non-chlorinated organic compounds:

Kiln stack emissions of these compounds are dominated by the conditions of the kiln system and the associated air pollution control equipment. As such, emissions are not expected to change with a higher ALCF substitution rate (Richards, Goshaw, Speer, & Holder, 2008) (Castañón, et al., 2021).

4.3 Assessment of In-Stack Emission Limits for Equipment with Specific Operational Limits

The cement kiln is a piece of equipment with specific operational limits during the use of ALCF as defined in the facility ECA. An assessment of the in-stack emission limits outlined in Schedule B of the ECA was completed for the 2025 operating year during the use of ALCFs as outlined in the 2025 stack test report provided in Appendix F.

As described in Section 4.2, the results of the 2025 stack test report were prorated to estimate the two maximum emission scenarios (base case and future case) emission rates.

The maximum concentration for each emission scenario was estimated by multiplying the 2025 stack testing report emission rate of the Schedule B parameter by the percentage change for that parameter in the new emission scenario and dividing by the reference flow rate for the new emission scenario.

The calculated pro-rated in-stack concentrations are summarized in the table below. Sample calculations of the concentrations are provided in calculation sheet E1B located in Appendix E. As shown in the table below, the facility is expected to meet all in-stack limits when ALCF is used in both emission scenarios.

Parameter	Stack Testing Results [1]	Base Case [1]	Future Case [1]	ECA Limit [2]
Particulate Matter	8.37 mg/Rm³	8.98 mg/Rm³	8.98 mg/Rm³	50 mg/Rm³
Cadmium	< 0.0481 µg/Rm³	0.06 µg/Rm³	0.06 µg/Rm³	7 µg/Rm³
Lead	< 0.718 µg/Rm³	0.94 µg/Rm³	0.94 µg/Rm³	60 µg/Rm³
Mercury	< 1.07 µg/Rm³	1.39 µg/Rm³	1.37 µg/Rm³	20 µg/Rm³
Dioxins and Furans	< 3.97 pg/Rm³ TEQ	5.56 pg/Rm³ TEQ	6.00 pg/Rm³ TEQ	80 pg/Rm³ ITEQ
Hydrochloric Acid	2.59 mg/Rm³	3.63 mg/Rm³	3.91 mg/Rm³	27 mg/Rm³

Notes:
[1] - Concentration referenced to dry conditions at 25°C, 101.3kPa, and 11% oxygen
[2] -- Schedule B of ECA referenced to dry conditions at 25°C, 101.3kPa, and 11% oxygen

5. Source Summary Table and Site Plan

The Source Summary is given in Tables A3-A (Source Data) and A3-B (Emissions Data), Appendix A.

The facility location, property boundary, site layout, and source locations are given in Figures B2-A to B2-E, in Appendix B.

6. Dispersion Modelling

Table D1, Appendix D summarizes the dispersion modelling input in accordance with O. Reg. 419/05.

6.1 Modelling Using CALPUFF and AERMOD

Dispersion modelling was conducted in accordance with the Air Dispersion Modelling Guideline for Ontario (ADMGO), Version 3, February 2017.

[redacted]

[redacted]

[redacted]

[redacted]

The results of CALPUFF and AERMOD were summed using a tiered approach. This methodology has been reviewed and approved by Ministry's Emission Monitoring and Research Branch (EMRB). A copy of the Section 7 notice is presented in Appendix G.

[redacted]

[redacted]

[redacted]

6.2 Meteorology

6.2.1 CALPUFF Meteorology (CALMET)

For CALPUFF modelling, the site-specific meteorological data files (CALMET 2018-2022) provided by the Ministry were used. A copy of the Section 13(1) notice [XS11.1] is presented in Appendix H

6.2.2 AERMOD Meteorology (AERMET)

The following site-specific hourly surface and upper air meteorological data files processed and provided by the Ministry were used for the dispersion modelling analysis:

- StMarysCementCanada_BowmanvilleCementPlant_Bowmanville_24142.SFC; and
- StMarysCementCanada_BowmanvilleCementPlant_Bowmanville_24142.PFL.

A copy of the Section 13(1) email notice is presented in Appendix H.

6.3 Modelling Domain and Receptor Grid

All modelling was undertaken in UTM coordinates as defined in the Modelling Parameters Table (Table D2).

[redacted] A tiered receptor grid was also created based upon the receptor spacing guidelines in the Ministry's ADMGO as presented in Figures D1-A (Appendix D). To reduce run time receptors located within Lake Ontario have been excluded from the model as per Section 11.2 iii of the Ministry Procedure. [redacted]

The same modelling domain, receptor grid and set of discrete receptors for CALPUFF were used for AERMOD.

6.4 Terrain Data

Canadian Digital Elevation Model (CDEM) data obtained from the MECP (GeoTIFF file 030M) was used to as the source data to determine elevations for the pit source and receptors for the AERMOD models.

Base elevations of sources, buildings, and receptors for the CALPUFF models were obtained from the MECP, which were derived from the geo.dat file used to develop the MECP CALMET data under Section 13.

6.5 Building Downwash

The onsite primary stacks including the kiln stack were modelled as point sources. As such building downwash (BPIP PRIME) has been considered in the modelling exercise. The same BPIP inputs and outputs have been used for both AERMOD and CALPUFF.

6.6 Source Parameters and Special Considerations

Source physical parameters and emission rates for all sources are given in Tables D2-A and D2-B, respectively, in Appendix D.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

7. Emission Summary Table and Conclusions

For each contaminant, the maximum off-property concentrations predicted by the AERMOD dispersion model are compared to applicable Air Contaminant Benchmarks (ACB) in Table A4, "Emission Summary Tables", given in Appendix A.

More specifically, to assess compliance, maximum concentrations were compared the applicable ACB under Section 20, O.Reg. 419/05 found in the ACB List, Version 4, dated April 2026.

Table A3 indicates that maximum concentrations of contaminants with MECP[XS26.1] limits do not exceed the applicable ACB. In summary, the facility can operate in compliance with Section 20 of O.Reg. 419/05.

Ramboll Canada Inc.

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8. References

Castañón, A. M., Sanmiquel, L., Bascompta, M., Fuente, A. V., Contreras, V., & Gómez-Fernández, F. (2021). Used Tires as Fuel in Clinker Production: Economic and Environmental Implications. *Sustainability, 13*(10455). doi:https://doi.org/10.3390/su131810455

Richards, J., Goshaw, D., Speer, D., & Holder, T. (2008). *Air Emissions Data Summary for Portland Cement Pyroprocessing Operations Firing Tire-Derived Fuels (PCA R&D Serial No. 3050).* Skokie, Illinois, USA: Portland Cement Association.

Appendix A
TABLES

Sensitive information has been redacted

Table A4: Emission Summary Table - Base and Future Case

Contaminant	CAS Number	Total Facility Emission Rate [g/s]		Air Dispersion Model Used	Max. POI Conc. [µg/m³](1)		MECP Limit						Percentage of MECP POI Limit [%]	
		Base	Future		Base	Future	Avg. Period Emission Rate	Avg. Period POI Concentration	Value [µg/m³]	Limiting Effect	ACB Source(2)	Category	Base	Future
Criteria Air Contaiminants														
PM	PM	9.50E+00	9.50E+00	AERMOD v24142 & CALPUFF v7.3.2	96.08	96.08	24 hr	24 hr	120	Health	S	B2	80.1%	80.1%
RCS	14263-59-3	1.69E-01	1.69E-01	AERMOD v24142 & CALPUFF v7.3.2	2.10	2.10	24 hr	24 hr	5	Health	G	B1	41.9%	41.9%
Nitrogen Oxides	10102-44-0	9.43E+01	9.43E+01	CALPUFF v7.3.2	3.56E+02	3.56E+02	1 hr	1 hr	400	Health	S	B1	89.1%	89.1%
Nitrogen Oxides	10102-44-0	9.38E+01	9.38E+01	**CALPUFF v7.3.2**	8.04E+01	8.04E+01	24 hr	24 hr	200	**Health**	S	B1	40.2%	40.2%
Sulphur Dioxide	**7446-09-5**	1.44E+01	1.30E+01	**CALPUFF v7.3.2**	5.47E+01	4.93E+01	1 hr	1 hr	**100**	Health & Vegetation	S	B1	**54.7%**	49.3%
Sulphur Dioxide	7446-09-5	**1.44E+01**	1.30E+01	**CALPUFF v7.3.2**	8.64E-01	8.44E-01	Annual	Annual	10	Health & Vegetation	S	B1	**8.64%**	**8.44%**
Carbon Monoxide	630-08-0	9.14E+01	9.14E+01	CALPUFF v7.3.2	3.46E+03	3.46E+03	1 hr	0.5 hr	6000	Health	S	B1	57.6%	57.6%
Hydrogen Chloride	7647-01-0	6.01E-01	6.49E-01	CALPUFF v7.3.2	5.14E-01	5.55E-01	24 hr	24 hr	20	Health	S	B1	2.6%	2.8%
Ammonia	7664-41-7	3.51E+00	3.51E+00	CALPUFF v7.3.2	3.00E+00	3.00E+00	24 hr	24 hr	100	**Health**	S	B1	3.0%	3.0%
Metals														
Antimony	7440-36-0	**1.33E-05**	1.33E-05	CALPUFF v7.3.2	1.85E-04	1.85E-04	24 hr	24 hr	25	Health	S	B1	<0.1%	<0.1%
Arsenic	7440-38-2	2.60E-04	2.61E-04	CALPUFF v7.3.2	1.55E-03	1.55E-03	24 hr	24 hr	0.3	Health	G	B1	0.5%	**0.5%**
Barium	7440-39-3	2.53E-03	2.61E-03	CALPUFF v7.3.2	2.19E-02	2.19E-02	24 hr	24 hr	10	Health	G	B1	0.2%	0.2%
Beryllium	7440-41-7	3.19E-05	3.14E-05	CALPUFF v7.3.2	1.93E-04	1.93E-04	24 hr	24 hr	0.01	**Health**	S	B1	1.9%	1.9%
Cadmium	**7440-43-9**	1.62E-05	1.62E-05	CALPUFF v7.3.2	5.51E-05	5.51E-05	24 hr	24 hr	0.025	Health	S	B1	0.2%	0.2%
Chromium	7440-47-3	**2.14E-03**	2.15E-03	**CALPUFF v7.3.2**	5.66E-02	5.66E-02	24 hr	24 hr	0.5	**Health**	S	**B1**	11.3%	11.3%
Cobalt	7440-48-4	1.27E-04	1.39E-04	CALPUFF v7.3.2	1.22E-03	1.22E-03	24 hr	24 hr	0.1	**Health**	G	B1	1.2%	**1.2%**
Iron	7439-89-6	2.21E-01	2.21E-01	CALPUFF v7.3.2	2.28E+00	2.28E+00	24 hr	24 hr	4	Health & Soiling	S	B1	57.1%	57.1%
Ferric Oxide	1309-37-1	3.16E-01	3.16E-01	CALPUFF v7.3.2	3.26E+00	3.26E+00	24 hr	24 hr	25	Health & Soiling	S	B1	13.1%	13.1%
Lead	7439-92-1	3.54E-04	3.53E-04	**CALPUFF v7.3.2**	2.05E-03	2.05E-03	24 hr	24 hr	0.5	**Health**	S	**B1**	**0.4%**	0.4%
Lead	**7439-92-1**	3.54E-04	**3.53E-04**	CALPUFF v7.3.2	7.90E-04	7.90E-04	24 hr	30 day	0.2	**Health**	S	B1	**0.4%**	**0.4%**
Manganese	**7439-96-5**	9.02E-03	**9.05E-03**	**CALPUFF v7.3.2**	8.26E-02	8.26E-02	24 hr	**24 hr**	0.4	**Health**	S	B1	**20.7%**	20.7%
Mercury	7439-97-6	2.54E-04	**2.50E-04**	CALPUFF v7.3.2	2.20E-04	2.16E-04	24 hr	24 hr	2	Health	S	B1	<0.1%	<0.1%
Nickel	7440-02-0	2.78E-03	2.62E-03	CALPUFF v7.3.2	1.15E-02	1.15E-02	Annual	Annual	0.04	Health	S	B1	28.7%	28.7%
Nickel	7440-02-0	2.78E-03	2.62E-03	CALPUFF v7.3.2	1.15E-02	1.15E-02	24 hr	Annual	0.4	**Health**	**MECP bulletin**	AAV	2.9%	2.9%
Nickel	7440-02-0	2.78E-03	2.62E-03	**CALPUFF v7.3.2**	6.57E-02	6.57E-02	24 hr	24 hr	2	Health	MECP bulletin	URT/DAV	3.3%	3.3%
Selenium	**7782-49-2**	**2.30E-04**	**2.13E-04**	**CALPUFF v7.3.2**	2.16E-04	2.11E-04	**24 hr**	24 hr	10	**Health**	G	B1	**<0.1%**	**<0.1%**
Silver	**7440-22-4**	4.00E-05	4.13E-05	CALPUFF v7.3.2	1.46E-04	1.46E-04	24 hr	**24 hr**	1	Health	S	B1	<0.1%	<0.1%
Tin	7440-31-5	1.40E-04	1.40E-04	CALPUFF v7.3.2	2.17E-03	2.17E-03	24 hr	24 hr	10	Health	S	B1	<0.1%	<0.1%
Vanadium	7440-62-2	1.04E-03	1.02E-03	CALPUFF v7.3.2	8.55E-03	8.55E-03	24 hr	24 hr	2	Health	S	B1	0.4%	0.4%
Volatile Organic Matter														
Acetaldehyde	**75-07-0**	**5.46E-01**	5.46E-01	**CALPUFF v7.3.2**	**5.48E+00**	5.48E+00	0.5 hr	0.5 hr	500	**Health**	S	**B1**	1.1%	1.1%
Acrolein	107-02-8	5.78E-02	5.78E-02	CALPUFF v7.3.2	4.94E-02	4.94E-02	24 hr	**24 hr**	0.4	Health	S	**B1**	**12.4%**	12.4%
Acrolein	107-02-8	5.78E-02	5.78E-02	CALPUFF v7.3.2	4.78E-01	4.78E-01	1 hr	1 hr	4.5	Health	S	B1	10.6%	10.6%
Benzene	71-43-2	2.32E-01	2.32E-01	CALPUFF v7.3.2	7.33E-03	7.33E-03	Annual	Annual	0.45	Health	S	B1	1.6%	1.6%
Benzene	71-43-2	2.32E-01	2.32E-01	CALPUFF v7.3.2	7.33E-03	7.33E-03	24 hr	Annual	4.5	**Health**	MECP bulletin	AAV	0.2%	0.2%
Benzene	71-43-2	**2.32E-01**	2.32E-01	**CALPUFF v7.3.2**	1.98E-01	**1.98E-01**	24 hr	24 hr	100	**Health**	**MECP bulletin**	**URT/DAV**	**0.2%**	**0.2%**
1,3-Butadiene	106-99-0	**6.73E-02**	6.73E-02	**CALPUFF v7.3.2**	2.13E-03	**2.13E-03**	**Annual**	Annual	2	**Health**	S	B1	0.1%	0.1%
1,3-Butadiene	106-99-0	6.73E-02	6.73E-02	CALPUFF v7.3.2	2.13E-03	2.13E-03	24 hr	Annual	20	Health	MECP bulletin	AAV	<0.1%	<0.1%
1,3-Butadiene	106-99-0	6.73E-02	6.73E-02	CALPUFF v7.3.2	5.76E-02	5.76E-02	24 hr	24 hr	300	Health	MECP bulletin	URT/DAV	<0.1%	<0.1%
Carbon tetrachloride	56-23-5	8.60E-03	9.28E-03	CALPUFF v7.3.2	7.35E-03	7.94E-03	24 hr	24 hr	2.4	**Health**	S	B1	0.3%	0.3%
Chloroform	**67-66-3**	1.28E-02	1.39E-02	CALPUFF v7.3.2	1.10E-02	1.19E-02	24 hr	**24 hr**	1	**Health**	S	B1	1.1%	1.2%
Dibromochloromethane	124-48-1	**9.09E-03**	**9.82E-03**	CALPUFF v7.3.2	7.78E-03	**8.40E-03**	24 hr	24 hr	0.2	**Health**	**SL-JSL**	**B2**	**3.9%**	**4.2%**
1,2-Dichloroethane	107-06-2	8.60E-03	**9.28E-03**	CALPUFF v7.3.2	7.35E-03	7.94E-03	24 hr	24 hr	2	Health	S	B1	0.4%	0.4%
Ethylene dibromide	106-93-4	6.89E-03	6.89E-03	CALPUFF v7.3.2	5.89E-03	5.89E-03	24 hr	24 hr	3	Health	G	B1	0.2%	0.2%
Ethylene glycol	107-21-1	6.00E-01	6.00E-01	CALPUFF v7.3.2	1.07E+01	1.07E+01	24 hr	24 hr	12700	Health	G	B1	<0.1%	<0.1%
Phenol	108-95-2	2.50E+00	2.50E+00	CALPUFF v7.3.2	2.14E+00	2.14E+00	24 hr	24 hr	30	Health	S	B1	7.1%	7.1%
Propionaldehyde	**123-38-6**	8.79E-02	**8.79E-02**	CALPUFF v7.3.2	1.20E+00	1.20E+00	**10 min**	10 min	10	Odour	G	B1	12.0%	12.0%
1,1,1,2-Tetrachloroethane	**630-20-6**	8.60E-03	**9.28E-03**	**CALPUFF v7.3.2**	7.35E-03	7.94E-03	24 hr	24 hr	**0.5**	**Health**	SL-JSL	B2	1.5%	1.6%
1,1,2,2-Tetrachloroethane	79-34-5	9.09E-03	9.82E-03	CALPUFF v7.3.2	7.78E-03	8.40E-03	24 hr	24 hr	0.1	**Health**	SL-JSL	B2	**7.8%**	8.4%
Vinyl chloride	75-01-4	2.55E-02	2.76E-02	CALPUFF v7.3.2	2.18E-02	2.36E-02	24 hr	24 hr	1	Health	S	B1	2.2%	2.4%
Polycyclic Aromatic Hydrocarbons (PAHs)														
Benzo(a)pyrene	50-32-8	1.05E-06	**1.05E-06**	CALPUFF v7.3.2	3.32E-08	3.32E-08	**Annual**	**Annual**	0.00001	**Health**	S	**B1**	**0.3%**	**0.3%**
Benzo(a)pyrene	**50-32-8**	**1.05E-06**	1.05E-06	**CALPUFF v7.3.2**	3.32E-08	**3.32E-08**	**24 hr**	Annual	0.0001	**Health**	**MECP bulletin**	**AAV**	**<0.1%**	<0.1%
Benzo(a)pyrene	**50-32-8**	1.05E-06	1.05E-06	CALPUFF v7.3.2	8.98E-07	**8.98E-07**	24 hr	24 hr	0.005	**Health**	MECP bulletin	URT/DAV	<0.1%	<0.1%
Naphthalene	91-20-3	7.40E-02	7.40E-02	CALPUFF v7.3.2	6.33E-02	6.33E-02	24 hr	24 hr	22.5	Health Odour	G	B1	0.3%	0.3%
Naphthalene	91-20-3	7.40E-02	7.40E-02	CALPUFF v7.3.2	1.01E+00	1.01E+00	10 min	10 min	50	Health Odour	G	B1	2.0%	2.0%

		10 min	0.5 hr	1 hr	24 hr	30 day	Annual
KILN Unit Dispersion Factor (µg/m³)	CALPUFF v7.3.2	1.37E+01	1.00E+01	8.27E+00	8.55E-01	3.30E-01	3.16E-02

Notes:

(1) Modelling of the Quarry sources was in AERMOD, while all other sources were modelled in CALPUFF. For most contaminants, the maximum POI concentrations of both models were summed and were conservatively reported. PM (24hr) CALPUFF and AERMOD results were merged and then the maximum POI concentrations is reported with meteorological anomalies removed as per MECP Guideline A-10, "Air Dispersion Modelling Guideline for Ontario", Version 3.0, dated January 2016. Note that CaCO3 is not emitted from the kiln stack and is not affected by shoreline fumigation.

(2) ACB Source: "S" - Standard (for Section 20), "G" - Guideline (for Section 20), "SL-JSL" - Screening Level (SL) set by the MECP based on a review of toxicity information and/or other jurisdictional levels (JSL), "SL-PA" - Screening Level - Previously Accepted, "SL-MD" - Screening Level - Ministry Derived.

(3) PM - Particulate matter, RCS - respirable crystalline silica

(4) Category: B1 (Benchmark 1) - Exceedence of a B1 concentration triggers specific actions under O. Reg. 419/05 and is an offence under O. Reg. 1/17.
B2 (Benchmark 2) - Exceedence of a B2 concentration, or if no B2 value exists, triggers a toxicological assessment to determine the likelihood of adverse effect.

DAV and AAV: "DAV" - Daily Assessment Value to be compared against maximum 24-hr POI concentration, "AAV" - Annual Assessment Value to be compared against maximum annual POI concentration but assuming peak 24-hr average emission rate occurs every day in the year, as per MECP technical bulletin: "Using assessment values for contaminants with annual air standards".

URT = Upper Risk Threshold. URTs listed in Schedule 6 of O. Reg. 419/05 are not standards. URTs have separate and distinct regulatory and notification requirements. These requirements are set out in section 30 of O. Reg. 419/05.

(5) MECP's procedure for the removal of meterological anomalies was applied for NO_X (1hr), and SO_2 (1hr) (ADMGO, February 2017).
(6) Base Case - Maximum usage of ALCF of 400 tonnes per day, Future Case - Maximum usage of ALCF of 800 tonnes/day.

Modelling results with met anomalies removed (Merged AERMOD and CALPUFF or only CALPUFF)
Results are from the CALPUFF modelling files or the sum of the maximum POI concentrations from the AERMOD and CALPUFF modelling results
Results calculated using the KILN stack emission rate and the KILN stack unit dispersion factor

Appendix B
FIGURES

Sensitive information has been redacted



Legend

Property Line

0 2.5 5 Kilometers

SITE LOCATION OVERVIEW
ALCF ECA AMENDMENT APPLICATION

St. Marys Cement Inc. (Canada) - Bowmanville Facility

410 Bowmanville Avenue
Bowmanville, Ontario

FIGURE B2-A

RAMBOLL



Legend

- Property Line
- Quarry
- Cement Plant
- CBM Hagan 4 RMC Plant
- CBM Aggregate Storage and Shipping
- CBM Planetary RMC Plants
- Geo Reference

0 0.5 1 Kilometers

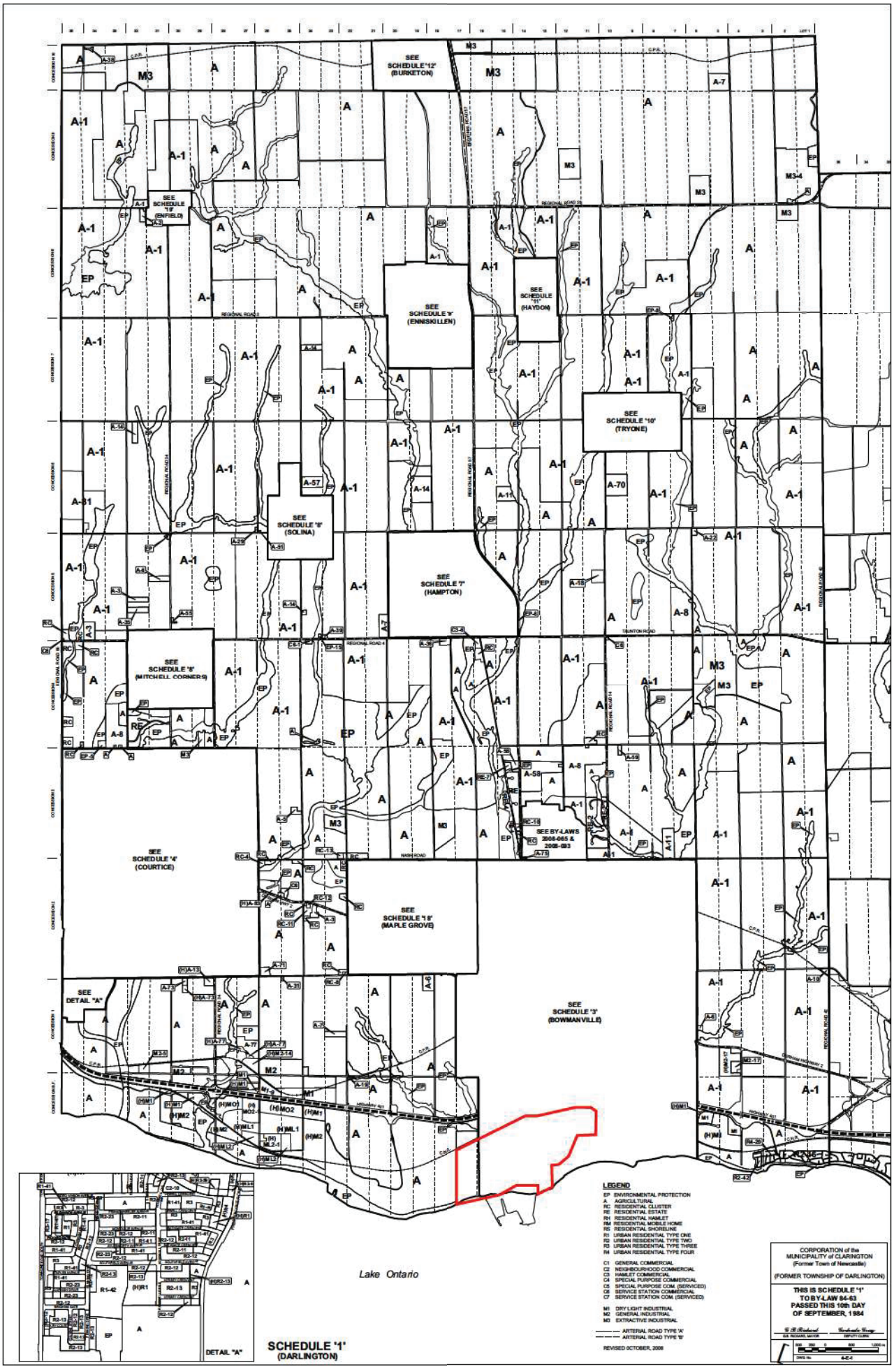
SITE OVERVIEW
ALCF ECA AMENDMENT APPLICATION

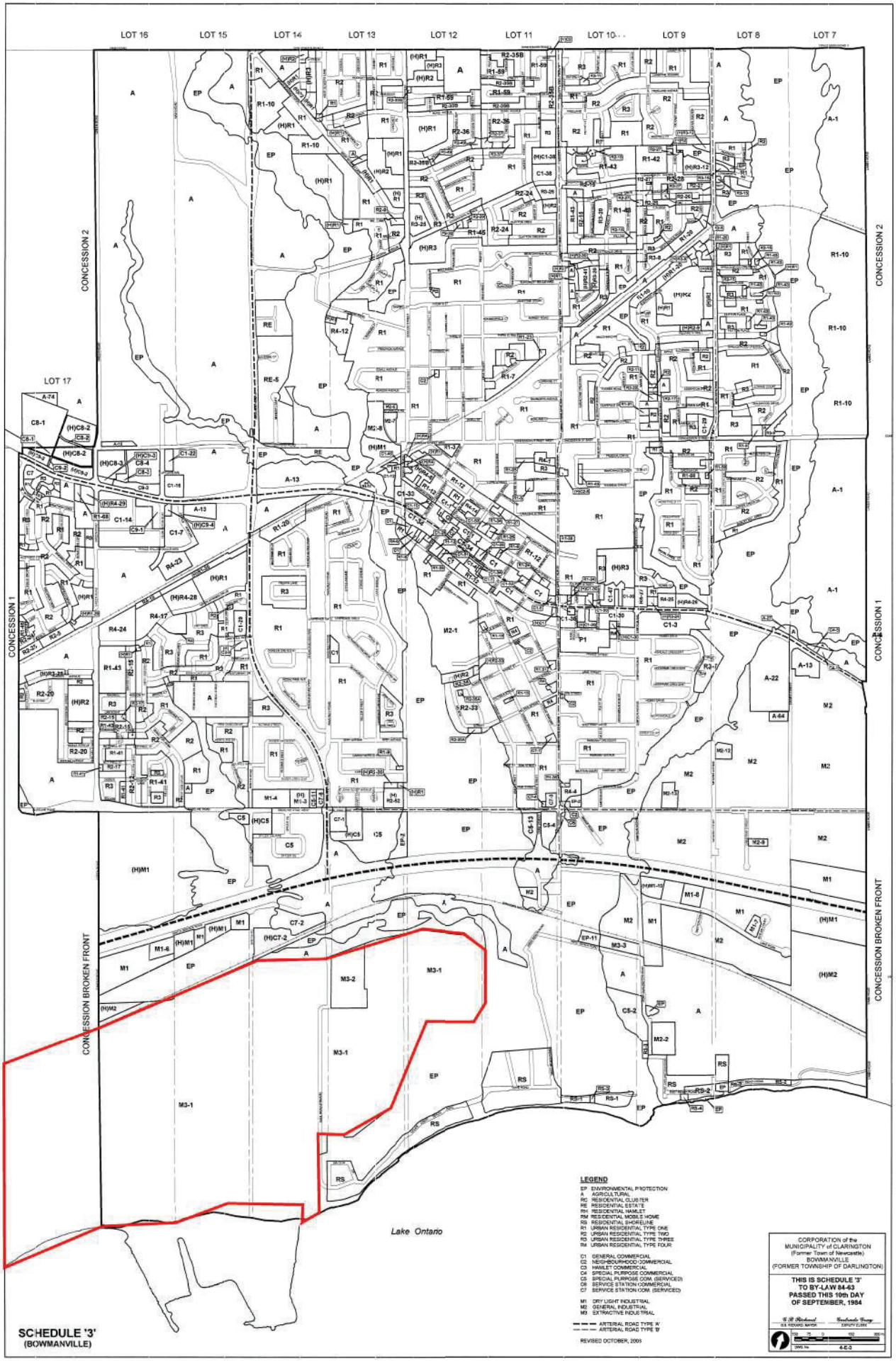
St. Marys Cement Inc. (Canada) - Bowmanville Facility
410 Bowmanville Avenue
Bowmanville, Ontario

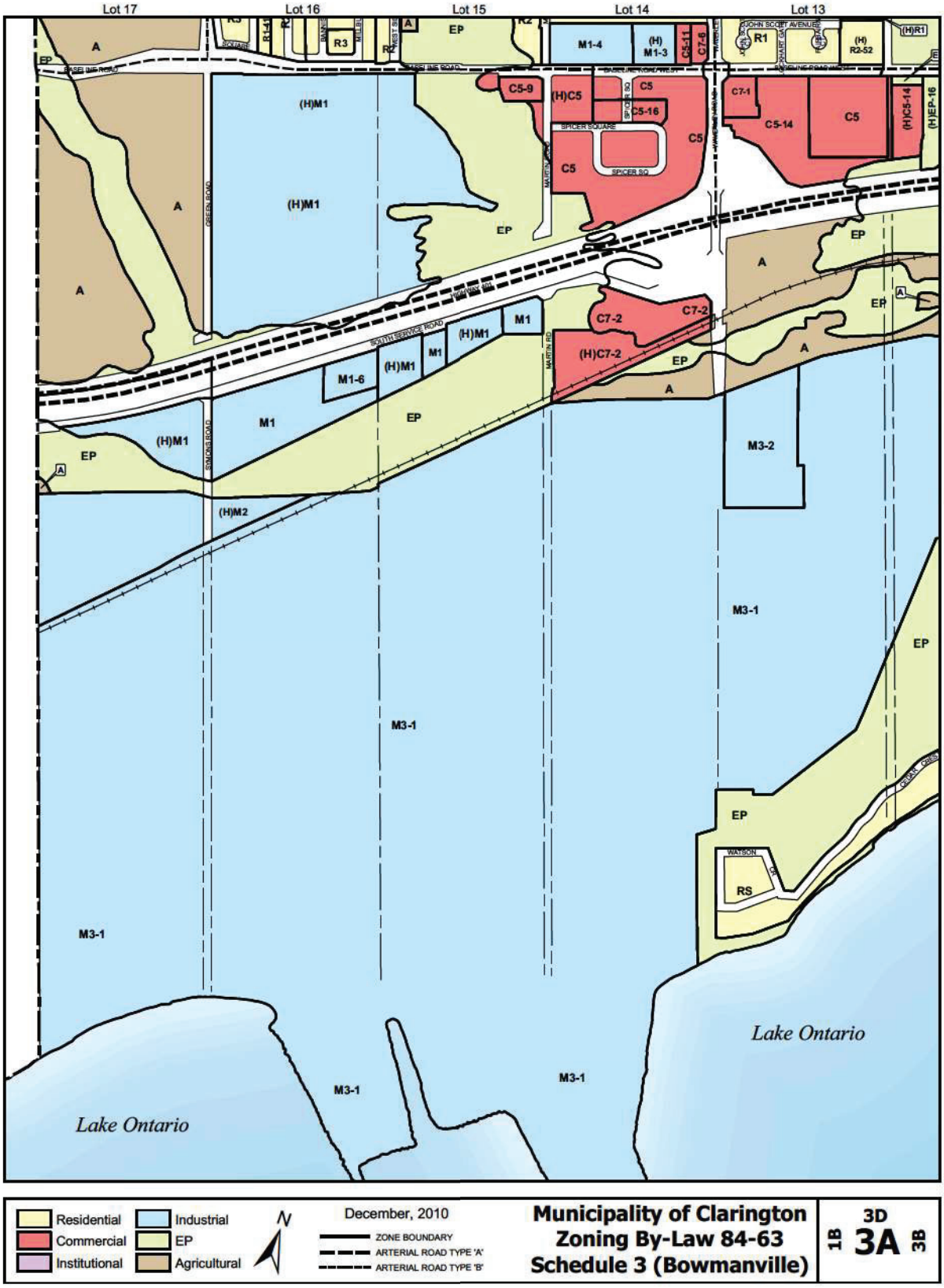
FIGURE B2-B

RAMBOLL

FIGURE B3


SEE SCHEDULE '12' (BURKETON)
SEE SCHEDULE '11' (HAYDON)
SEE SCHEDULE '9' (ENNISKILLEN)
SEE SCHEDULE '10' (TRYONE)
SEE SCHEDULE '8' (SOLINA)
SEE SCHEDULE '7' (HAMPTON)
SEE SCHEDULE '5' (MITCHELL CORNERS)
SEE SCHEDULE '4' (COURTICE)
SEE SCHEDULE '18' (MAPLE GROVE)
SEE SCHEDULE '3' (BOWMANVILLE)
SEE DETAIL "A"
SEE BY-LAWS 2008-065 & 2008-093
Lake Ontario
DETAIL "A"
SCHEDULE '1' (DARLINGTON)
LEGEND
EP ENVIRONMENTAL PROTECTION
A AGRICULTURAL
RC RESIDENTIAL CLUSTER
RE RESIDENTIAL ESTATE
RH RESIDENTIAL HAMLET
RM RESIDENTIAL MOBILE HOME
RS RESIDENTIAL SHORELINE
R1 URBAN RESIDENTIAL TYPE ONE
R2 URBAN RESIDENTIAL TYPE TWO
R3 URBAN RESIDENTIAL TYPE THREE
R4 URBAN RESIDENTIAL TYPE FOUR
C1 GENERAL COMMERCIAL
C2 NEIGHBOURHOOD COMMERCIAL
C3 HAMLET COMMERCIAL
C4 SPECIAL PURPOSE COMMERCIAL
C5 SPECIAL PURPOSE COM. (SERVICED)
C6 SERVICE STATION COMMERCIAL
C7 SERVICE STATION COM. (SERVICED)
M1 DRY LIGHT INDUSTRIAL
M2 GENERAL INDUSTRIAL
M3 EXTRACTIVE INDUSTRIAL
ARTERIAL ROAD TYPE 'A'
ARTERIAL ROAD TYPE 'B'
REVISED OCTOBER, 2008
CORPORATION of the MUNICIPALITY of CLARINGTON
(Former Town of Newcastle)
(FORMER TOWNSHIP OF DARLINGTON)
THIS IS SCHEDULE '1' TO BY-LAW 84-63 PASSED THIS 10th DAY OF SEPTEMBER, 1984


LOT 16
LOT 15
LOT 14
LOT 13
LOT 12
LOT 11
LOT 10
LOT 9
LOT 8
LOT 7
LOT 17
CONCESSION 2
CONCESSION 1
CONCESSION BROKEN FRONT
Lake Ontario
LEGEND
EP ENVIRONMENTAL PROTECTION
A AGRICULTURAL
RC RESIDENTIAL CLUSTER
RE RESIDENTIAL ESTATE
RH RESIDENTIAL HAMLET
RM RESIDENTIAL MOBILE HOME
RS RESIDENTIAL SHORELINE
R1 URBAN RESIDENTIAL TYPE ONE
R2 URBAN RESIDENTIAL TYPE TWO
R3 URBAN RESIDENTIAL TYPE THREE
R4 URBAN RESIDENTIAL TYPE FOUR
C1 GENERAL COMMERCIAL
C2 NEIGHBOURHOOD COMMERCIAL
C3 HAMLET COMMERCIAL
C4 SPECIAL PURPOSE COMMERCIAL
C5 SPECIAL PURPOSE COM. (SERVICED)
C6 SERVICE STATION COMMERCIAL
C7 SERVICE STATION COM. (SERVICED)
M1 DRY LIGHT INDUSTRIAL
M2 GENERAL INDUSTRIAL
M3 EXTRACTIVE INDUSTRIAL
ARTERIAL ROAD TYPE 'A'
ARTERIAL ROAD TYPE 'B'
REVISED OCTOBER, 2005
CORPORATION of the
MUNICIPALITY of CLARINGTON
(Former Town of Newcastle)
BOWMANVILLE
(FORMER TOWNSHIP OF DARLINGTON)
THIS IS SCHEDULE '3'
TO BY-LAW 84-63
PASSED THIS 10th DAY
OF SEPTEMBER, 1984
DWG No. 4-E-3
SCHEDULE '3'
(BOWMANVILLE)


Lot 17
Lot 16
Lot 15
Lot 14
Lot 13
Concession Broken Front
BASELINE ROAD
SOUTH SERVICE ROAD
GREEN ROAD
SIMONS ROAD
MARTIN RD
SPICER SQUARE
SPICER SQ
JOHN SCOTT AVENUE
WATSON
A
EP
(H)M1
M1
M1-4
(H) M1-3
C5-11
C7-6
R1
(H) R2-52
(H)R1
C5-9
(H)C5
C5
C5-16
C7-1
C5-14
(H)C5-14
(H)EP-16
C7-2
(H)C7-2
M1-6
(H)M2
M3-2
M3-1
RS
Lake Ontario
Residential
Commercial
Institutional
Industrial
EP
Agricultural
December, 2010
ZONE BOUNDARY
ARTERIAL ROAD TYPE 'A'
ARTERIAL ROAD TYPE 'B'
Municipality of Clarington
Zoning By-Law 84-63
Schedule 3 (Bowmanville)
1B
3A
3B
3D

Appendix C
NEGLIGIBLE CONTAMINANTS

Table C1: Assessment of Aggregate Emissions of Contaminants Using an Emission Threshold - Base Case

The following contaminants were assessed against Table B-1's screening dispersion factors (Procedure for Preparing an Emission Summary and Dispersion Modelling Report [Guideline A-10] v 4.1, Table B-1, 2018).

Source	Shortest Distance to Property Line [m]
Kiln	320

Dispersion Factor Rural

Source ID	Contaminant	CAS Number	POI Limit	Source for Emission Threshold	Avg. Period Emission Rate	Avg. Period POI Concentration	Averaging Period [hr]	Source Emission Rate [g/s]	Shortest Distance to Property Line by Source [m]	Table B-1 Distance Below Shortest Distance [m]	Table B-1 Dispersion Factor Below Shortest Distance [µg/m³ per g/s]	Table B-1 Distance Above Shortest Distance [m]	Table B-1 Dispersion Factor Above Shortest Distance [µg/m³ per g/s]	Interpolated Dispersion Factor [µg/m³ per g/s]	Converted Dispersion Factor for Applicable Averaging Period [µg/m³ per g/s]	Significance ?
Kiln	Hydrogen Chloride	7647-01-0	20	S	24 hr	24 hr	24	6.01E-01	320	300	1900	350	1700	1820	747.50	sig
Kiln	Ammonia	7664-41-7	100	S	24 hr	24 hr	24	3.51E+00	320	300	1900	350	1700	1820	747.50	sig
Kiln	Copper	7440-50-8	50	S	24 hr	24 hr	24	1.25E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Molybdenum	7439-98-7	120	G	24 hr	24 hr	24	1.13E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Thallium	7440-28-0	0.5	SL-JSL	24 hr	24 hr	24	2.00E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Zinc	7440-66-6	120	S	24 hr	24 hr	24	2.76E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acetaldehyde	75-07-0	500	S	24 hr	24 hr	24	5.46E-01	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acetaldehyde	75-07-0	500	S	0.5 hr	0.5 hr	0.5	5.46E-01	320	300	1900	350	1700	1820	2209.83	sig
Kiln	Acetone (2-Propanone)	67-64-1	11880	S	24 hr	24 hr	24	5.06E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acrolein	107-02-8	0.4	S	24 hr	24 hr	24	5.78E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Acrolein	107-02-8	4.5	S	1 hr	1 hr	1	5.78E-02	320	300	1900	350	1700	1820	1820.00	sig
Kiln	Bromodichloromethane	75-27-4	350	SL-JSL	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Bromoform	75-25-2	55	G	24 hr	24 hr	24	6.97E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Bromomethane	74-83-9	1350	G	24 hr	24 hr	24	1.63E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Methyl Ethyl Ketone (2-Butanone)	78-93-3	1000	S	24 hr	24 hr	24	2.43E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Carbon tetrachloride	56-23-5	2.4	S	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Chloroform	67-66-3	1	S	24 hr	24 hr	24	1.28E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Cumene	98-82-8	400	S	24 hr	24 hr	24	3.95E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Dibromochloromethane	124-48-1	0.2	SL-JSL	24 hr	24 hr	24	9.09E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Dichlorodifluoromethane	75-71-8	500000	G	24 hr	24 hr	24	1.76E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,2-Dichloroethane	107-06-2	2	S	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	1,1-Dichloroethene	75-35-4	10	S	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	trans-1,2-Dichloroethylene	156-60-5	105	G	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,2-Dichloropropane	78-87-5	2400	G	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Ethylbenzene	100-41-4	1900	G	10 min	10 min	0.16666667	2.72E-02	320	300	1900	350	1700	1820	3005.76	neg
Kiln	Ethylbenzene	100-41-4	1000	S	24 hr	24 hr	24	2.72E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Ethylene dibromide	106-93-4	3	G	24 hr	24 hr	24	6.89E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Mesitylene	108-67-8	220	S	24 hr	24 hr	24	3.13E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Methanol	67-56-1	4000	S	24 hr	24 hr	24	2.50E+00	320	300	1900	350	1700	1820	747.50	neg
Kiln	Methylene chloride	75-09-2	220	S	24 hr	24 hr	24	3.28E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Phenol	108-95-2	30	S	24 hr	24 hr	24	2.50E+00	320	300	1900	350	1700	1820	747.50	sig
Kiln	Propionaldehyde	123-38-6	10	G	10 min	10 min	0.16666667	8.79E-02	320	300	1900	350	1700	1820	3005.76	sig
Kiln	Styrene	100-42-5	400	S	24 hr	24 hr	24	2.39E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,1,1,2-Tetrachloroethane	630-20-6	0.5	SL-JSL	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	1,1,2,2-Tetrachloroethane	79-34-5	0.1	SL-JSL	24 hr	24 hr	24	9.09E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Toluene	108-88-3	2000	G	24 hr	24 hr	24	1.58E-01	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,1,1-Trichloroethane	71-55-6	115000	S	24 hr	24 hr	24	9.09E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Trichloroethylene	79-01-6	12	S	24 hr	24 hr	24	8.60E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Vinyl chloride	75-01-4	1	S	24 hr	24 hr	24	2.55E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Trichlorotrifluoroethane	76-13-1	800000	S	24 hr	24 hr	24	0.00E+00	320	300	1900	350	1700	1820	747.50	neg
Kiln	Trichlorofluoromethane	75-69-4	6000	G	24 hr	24 hr	24	1.73E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Xylenes	1330-20-7	3000	G	10 min	10 min	0.16666667	1.31E-01	320	300	1900	350	1700	1820	3005.76	neg
Kiln	Xylenes	1330-20-7	730	S	24 hr	24 hr	24	1.31E-01	320	300	1900	350	1700	1820	747.50	neg
Kiln	Dioxins, Furans and Dioxin-like PCBs	CDD	0.1	S	24 hr	24 hr	24	9.77E-10	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acenaphthylene	208-96-8	0.1	-	24 hr	24 hr	24	2.85E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Acenaphthene	83-32-9	0.1	-	24 hr	24 hr	24	9.33E-04	320	300	1900	350	1700	1820	747.50	sig
Kiln	Anthracene	120-12-7	0.1	-	24 hr	24 hr	24	1.60E-04	320	300	1900	350	1700	1820	747.50	sig
Kiln	Benzo(a)anthracene	56-55-3	0.1	-	24 hr	24 hr	24	1.06E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(b)fluoranthene	205-99-2	0.1	-	24 hr	24 hr	24	8.17E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(k)fluoranthene	207-08-9	0.1	-	24 hr	24 hr	24	5.95E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(a)fluorene	238-84-6	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(b)fluorene	243-17-4	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg

Table C1: Assessment of Aggregate Emissions of Contaminants Using an Emission Threshold - Base Case

The following contaminants were assessed against Table B-1's screening dispersion factors (Procedure for Preparing an Emission Summary and Dispersion Modelling Report [Guideline A-10] v 4.1, Table B-1, 2018).

Source	Shortest Distance to Property Line [m]
Kiln	320

Dispersion Factor Rural

Source ID	Contaminant	CAS Number	POI Limit	Source for Emission Threshold	Avg. Period Emission Rate	Avg. Period POI Concentration	Averaging Period [hr]	Source Emission Rate [g/s]	Shortest Distance to Property Line by Source [m]	Table B-1 Distance Below Shortest Distance [m]	Table B-1 Dispersion Factor Below Shortest Distance [µg/m³ per g/s]	Table B-1 Distance Above Shortest Distance [m]	Table B-1 Dispersion Factor Above Shortest Distance [µg/m³ per g/s]	Interpolated Dispersion Factor [µg/m³ per g/s]	Converted Dispersion Factor for Applicable Averaging Period [µg/m³ per g/s]	Significance ?
Kiln	Benzo(g,h,i)perylene	191-24-2	0.1	-	24 hr	24 hr	24	3.55E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(e)pyrene	192-97-2	0.1	-	24 hr	24 hr	24	3.18E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	2-Chloronaphthalene	91-58-7	1	SL-JSL	24 hr	24 hr	24	8.49E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Chrysene	218-01-9	0.1	-	24 hr	24 hr	24	3.30E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Coronene	191-07-1	0.1	-	24 hr	24 hr	24	3.10E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Dibenzo(a,c)anthracene	215-58-7	0.1	-	24 hr	24 hr	24	1.86E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	9,10-Dimethylanthracene	781-43-1	0.1	-	24 hr	24 hr	24	2.31E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	7,12-Dimethylbenzo(a)anthracene	57-97-6	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Fluoranthene	206-44-0	0.1	-	24 hr	24 hr	24	6.44E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Fluorene	86-73-7	0.1	-	24 hr	24 hr	24	1.16E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Indeno(1,2,3-cd)pyrene	193-39-5	0.1	-	24 hr	24 hr	24	9.47E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	2-Methylanthracene	613-12-7	0.1	-	24 hr	24 hr	24	6.93E-04	320	300	1900	350	1700	1820	747.50	sig
Kiln	3-Methylcholanthrene	56-49-5	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	1-Methylnaphthalene	90-12-0	35.5	SL-JSL	24 hr	24 hr	24	2.15E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	2-Methylnaphthalene	91-67-6	0.1	-	24 hr	24 hr	24	3.55E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	1-Methylphenanthrene	832-69-9	0.1	-	24 hr	24 hr	24	1.40E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	9-Methylphenanthrene	883-20-5	0.1	-	24 hr	24 hr	24	1.43E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Naphthalene	91-20-3	22.5	G	24 hr	24 hr	24	7.40E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Naphthalene	91-20-3	50	G	10 min	10 min	0.16666667	7.40E-02	320	300	1900	350	1700	1820	3005.76	sig
Kiln	Perylene	198-55-0	0.1	-	24 hr	24 hr	24	1.00E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Phenanthrene	85-01-8	0.1	-	24 hr	24 hr	24	6.29E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Picene	213-46-7	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Pyrene	129-00-0	0.1	-	24 hr	24 hr	24	3.38E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Tetralin	119-64-2	151.5	SL-JSL	24 hr	24 hr	24	1.19E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Triphenylene	217-59-4	0.1	-	24 hr	24 hr	24	2.12E-06	320	300	1900	350	1700	1820	747.50	neg

Table C1: Assessment of Aggregate Emissions of Contaminants Using an Emission Threshold - Future Case

The following contaminants were assessed against Table B-1's screening dispersion factors (Procedure for Preparing an Emission Summary and Dispersion Modelling Report [Guideline A-10] v 4.1, Table B-1, 2018).

Source	Shortest Distance to Property Line [m]
Kiln	320

Dispersion Factor Rural

Source ID	Contaminant	CAS Number	POI Limit	Source for Emission Threshold	Avg. Period Emission Rate	Avg. Period POI Concentration	Averaging Period [hr]	Source Emission Rate [g/s]	Shortest Distance to Property Line by Source [m]	Table B-1 Distance Below Shortest Distance [m]	Table B-1 Dispersion Factor Below Shortest Distance [µg/m³ per g/s]	Table B-1 Distance Above Shortest Distance [m]	Table B-1 Dispersion Factor Above Shortest Distance [µg/m³ per g/s]	Interpolated Dispersion Factor [µg/m³ per g/s]	Converted Dispersion Factor for Applicable Averaging Period [µg/m³ per g/s]	Significance ?
Kiln	Hydrogen Chloride	7647-01-0	20	S	24 hr	24 hr	24	6.49E-01	320	300	1900	350	1700	1820	747.50	sig
Kiln	Ammonia	7664-41-7	100	S	24 hr	24 hr	24	3.51E+00	320	300	1900	350	1700	1820	747.50	sig
Kiln	Copper	7440-50-8	50	S	24 hr	24 hr	24	1.25E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Molybdenum	7439-98-7	120	G	24 hr	24 hr	24	1.13E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Thallium	7440-28-0	0.5	SL-JSL	24 hr	24 hr	24	2.00E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Zinc	7440-66-6	120	S	24 hr	24 hr	24	2.76E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acetaldehyde	75-07-0	500	S	24 hr	24 hr	24	5.46E-01	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acetaldehyde	75-07-0	500	S	0.5 hr	0.5 hr	0.5	5.46E-01	320	300	1900	350	1700	1820	2209.83	sig
Kiln	Acetone (2-Propanone)	67-64-1	11880	S	24 hr	24 hr	24	5.06E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acrolein	107-02-8	0.4	S	24 hr	24 hr	24	5.78E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Acrolein	107-02-8	4.5	S	1 hr	1 hr	1	5.78E-02	320	300	1900	350	1700	1820	1820.00	sig
Kiln	Bromodichloromethane	75-27-4	350	SL-JSL	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Bromoform	75-25-2	55	G	24 hr	24 hr	24	6.97E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Bromomethane	74-83-9	1350	G	24 hr	24 hr	24	1.63E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Methyl Ethyl Ketone (2-Butanone)	78-93-3	1000	S	24 hr	24 hr	24	2.43E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Carbon tetrachloride	56-23-5	2.4	S	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Chloroform	67-66-3	1	S	24 hr	24 hr	24	1.39E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Cumene	98-82-8	400	S	24 hr	24 hr	24	3.95E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Dibromochloromethane	124-48-1	0.2	SL-JSL	24 hr	24 hr	24	9.82E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Dichlorodifluoromethane	75-71-8	500000	G	24 hr	24 hr	24	1.90E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,2-Dichloroethane	107-06-2	2	S	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	1,1-Dichloroethene	75-35-4	10	S	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	trans-1,2-Dichloroethylene	156-60-5	105	G	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,2-Dichloropropane	78-87-5	2400	G	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Ethylbenzene	100-41-4	1900	G	10 min	10 min	0.16666667	2.72E-02	320	300	1900	350	1700	1820	3005.76	neg
Kiln	Ethylbenzene	100-41-4	1000	S	24 hr	24 hr	24	2.72E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Ethylene dibromide	106-93-4	3	G	24 hr	24 hr	24	6.89E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Mesitylene	108-67-8	220	S	24 hr	24 hr	24	3.13E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Methanol	67-56-1	4000	S	24 hr	24 hr	24	2.50E+00	320	300	1900	350	1700	1820	747.50	neg
Kiln	Methylene chloride	75-09-2	220	S	24 hr	24 hr	24	3.54E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Phenol	108-95-2	30	S	24 hr	24 hr	24	2.50E+00	320	300	1900	350	1700	1820	747.50	sig
Kiln	Propionaldehyde	123-38-6	10	G	10 min	10 min	0.16666667	8.79E-02	320	300	1900	350	1700	1820	3005.76	sig
Kiln	Styrene	100-42-5	400	S	24 hr	24 hr	24	2.39E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,1,1,2-Tetrachloroethane	630-20-6	0.5	SL-JSL	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	1,1,2,2-Tetrachloroethane	79-34-5	0.1	SL-JSL	24 hr	24 hr	24	9.82E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Toluene	108-88-3	2000	G	24 hr	24 hr	24	1.58E-01	320	300	1900	350	1700	1820	747.50	neg
Kiln	1,1,1-Trichloroethane	71-55-6	115000	S	24 hr	24 hr	24	9.82E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Trichloroethylene	79-01-6	12	S	24 hr	24 hr	24	9.28E-03	320	300	1900	350	1700	1820	747.50	neg
Kiln	Vinyl chloride	75-01-4	1	S	24 hr	24 hr	24	2.76E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Trichlorotrifluoroethane	76-13-1	800000	S	24 hr	24 hr	24	0.00E+00	320	300	1900	350	1700	1820	747.50	neg
Kiln	Trichlorofluoromethane	75-69-4	6000	G	24 hr	24 hr	24	1.86E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Xylenes	1330-20-7	3000	G	10 min	10 min	0.16666667	1.31E-01	320	300	1900	350	1700	1820	3005.76	neg
Kiln	Xylenes	1330-20-7	730	S	24 hr	24 hr	24	1.31E-01	320	300	1900	350	1700	1820	747.50	neg
Kiln	Dioxins, Furans and Dioxin-like PCBs	CDD	0.1	S	24 hr	24 hr	24	1.05E-09	320	300	1900	350	1700	1820	747.50	neg
Kiln	Acenaphthylene	208-96-8	0.1	-	24 hr	24 hr	24	2.85E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Acenaphthene	83-32-9	0.1	-	24 hr	24 hr	24	9.33E-04	320	300	1900	350	1700	1820	747.50	sig
Kiln	Anthracene	120-12-7	0.1	-	24 hr	24 hr	24	1.60E-04	320	300	1900	350	1700	1820	747.50	sig
Kiln	Benzo(a)anthracene	56-55-3	0.1	-	24 hr	24 hr	24	1.06E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(b)fluoranthene	205-99-2	0.1	-	24 hr	24 hr	24	8.17E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(k)fluoranthene	207-08-9	0.1	-	24 hr	24 hr	24	5.95E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(a)fluorene	238-84-6	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(b)fluorene	243-17-4	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg

Table C1: Assessment of Aggregate Emissions of Contaminants Using an Emission Threshold - Future Case

The following contaminants were assessed against Table B-1's screening dispersion factors (Procedure for Preparing an Emission Summary and Dispersion Modelling Report [Guideline A-10] v 4.1, Table B-1, 2018).

Source	Shortest Distance to Property Line [m]
Kiln	320

Dispersion Factor Rural

Source ID	Contaminant	CAS Number	POI Limit	Source for Emission Threshold	Avg. Period Emission Rate	Avg. Period POI Concentration	Averaging Period [hr]	Source Emission Rate [g/s]	Shortest Distance to Property Line by Source [m]	Table B-1 Distance Below Shortest Distance [m]	Table B-1 Dispersion Factor Below Shortest Distance [µg/m³ per g/s]	Table B-1 Distance Above Shortest Distance [m]	Table B-1 Dispersion Factor Above Shortest Distance [µg/m³ per g/s]	Interpolated Dispersion Factor [µg/m³ per g/s]	Converted Dispersion Factor for Applicable Averaging Period [µg/m³ per g/s]	Significance ?
Kiln	Benzo(g,h,i)perylene	191-24-2	0.1	-	24 hr	24 hr	24	3.55E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Benzo(e)pyrene	192-97-2	0.1	-	24 hr	24 hr	24	3.18E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	2-Chloronaphthalene	91-58-7	1	SL-JSL	24 hr	24 hr	24	9.17E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Chrysene	218-01-9	0.1	-	24 hr	24 hr	24	3.30E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Coronene	191-07-1	0.1	-	24 hr	24 hr	24	3.10E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Dibenzo(a,c)anthracene	215-58-7	0.1	-	24 hr	24 hr	24	1.86E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	9,10-Dimethylanthracene	781-43-1	0.1	-	24 hr	24 hr	24	2.31E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	7,12-Dimethylbenzo(a)anthracene	57-97-6	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Fluoranthene	206-44-0	0.1	-	24 hr	24 hr	24	6.44E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Fluorene	86-73-7	0.1	-	24 hr	24 hr	24	1.16E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Indeno(1,2,3-cd)pyrene	193-39-5	0.1	-	24 hr	24 hr	24	9.47E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	2-Methylanthracene	613-12-7	0.1	-	24 hr	24 hr	24	6.93E-04	320	300	1900	350	1700	1820	747.50	sig
Kiln	3-Methylcholanthrene	56-49-5	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	1-Methylnaphthalene	90-12-0	35.5	SL-JSL	24 hr	24 hr	24	2.15E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	2-Methylnaphthalene	91-67-6	0.1	-	24 hr	24 hr	24	3.55E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	1-Methylphenanthrene	832-69-9	0.1	-	24 hr	24 hr	24	1.40E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	9-Methylphenanthrene	883-20-5	0.1	-	24 hr	24 hr	24	1.43E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Naphthalene	91-20-3	22.5	G	24 hr	24 hr	24	7.40E-02	320	300	1900	350	1700	1820	747.50	sig
Kiln	Naphthalene	91-20-3	50	G	10 min	10 min	0.16666667	7.40E-02	320	300	1900	350	1700	1820	3005.76	sig
Kiln	Perylene	198-55-0	0.1	-	24 hr	24 hr	24	1.00E-06	320	300	1900	350	1700	1820	747.50	neg
Kiln	Phenanthrene	85-01-8	0.1	-	24 hr	24 hr	24	6.29E-03	320	300	1900	350	1700	1820	747.50	sig
Kiln	Picene	213-46-7	0.1	-	24 hr	24 hr	24	3.59E-07	320	300	1900	350	1700	1820	747.50	neg
Kiln	Pyrene	129-00-0	0.1	-	24 hr	24 hr	24	3.38E-05	320	300	1900	350	1700	1820	747.50	neg
Kiln	Tetralin	119-64-2	151.5	SL-JSL	24 hr	24 hr	24	1.19E-02	320	300	1900	350	1700	1820	747.50	neg
Kiln	Triphenylene	217-59-4	0.1	-	24 hr	24 hr	24	2.12E-06	320	300	1900	350	1700	1820	747.50	neg

Appendix D
DISPERSION MODELLING

Sensitive information has been redacted

Table D1: Dispersion Modelling Input Summary

Relevant Section of Regulation 419	Section Title	Description of How the Approved Dispersion was Used
6	Approved Dispersion Models	AERMOD (Version 24142); CALPUFF (Version 7.3.2, Level 200113)
8	Negligible Sources of Contaminant	See Section 3
9	Same Structure Contamination	Not Applicable
10	Operating Conditions	See Section 4.1
11	Source of Contaminant Emission Rate	Appendix E
12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	See Section 4.1
13	Meteorological Conditions	See Section 6.2
14	Area of Modelling Coverage	See Section 6.3
15	Stack Height for Certain New Sources of Contaminant	Not Applicable
16	Terrain Data	See Section 6.4
17	Averaging Periods	10min, 0.5 hr, 1 hr, 24 hr, 30 day, Annual

Appendix E
EMISSION ESTIMATES

Sensitive information has been redacted

Appendix F

STACK TEST RESULTS AND MATERIAL COMPOSITION

Sensitive information has been redacted

Appendix F-1

ST. MARYS CEMENT INC. (CANADA) – CEMENT PLANT SAFETY DATA SHEETS

Sensitive information has been redacted

Appendix F-2

CBM – RMC PLANT SAFETY DATA SHEETS

Sensitive information has been redacted

Appendix G
SECTION 13 AND SECTION 7 NOTICES

Sensitive information has been redacted

Ministry of the Environment, Conservation and Parks

Environmental Monitoring and Reporting Branch

125 Resources Road
Toronto ON M9P 3V6
Tel.: 416 235-6300

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction de la surveillance environnementale

125, chemin Resources
Toronto ON M9P 3V6
Tél. : 416 235-6300

Ontario

Notice number: ***5011-DGDK8E***
Reference number: ***2628-CH5K47***

Notice

Pursuant to subsection 7(1) of O. Reg. 419/05,
made under the Environmental Protection Act, R.S.O. 1990, c.E 19 (EPA)

To: **St. Marys Cement Inc. (Canada)**
55 Industrial Street
Toronto, Ontario
M4G3W9

Site: **Bowmanville Cement Plant**
410 Bowmanville Avenue
Municipality of Clarington,
Ontario L1C7B5

Part 1: Definitions

In this Notice,

"Act" means the Environmental Protection Act, R.S.O. 1990, c. E. 19, as amended;

"Director" means the undersigned Director or any other person appointed under section 5 of the Act as a Director for the purposes of section 7 and 52 of the Regulation;

"Facility" means the plant, structure and any other thing that may discharge a contaminant that is located at 410 Bowmanville Avenue, Municipality of Clarington, Ontario;

"Notice" means this Notice number ***5011-DGDK8E***, as it may be amended from time to time;

“particulate-based contaminant” means any contaminant released as part of a solid particulate and/or liquid droplets, including all contaminants adhered to the surface of these.

“Person Responsible” means St. Marys Cement Inc. (Canada) being the person who discharges or causes or permits the discharge of contaminants from the Facility into the air; and

“Regulation” means Ontario Regulation 419/05: Air Pollution - Local Air Quality, made under the Act.

Part 2: Legal Authority and Grounds for Notice

2.1 I am appointed as a Director for the purposes of section 7 of the Regulation.

2.2 The Person Responsible is a person who discharges or causes or permits the discharge of contaminants from a property, namely the Facility.

2.3 For the purpose of clause 7 (1) (a) of the Regulation, subject to item 2.6 of this Notice, I am of the opinion that the following dispersion model would predict concentrations of a contaminant at least as accurately as an approved dispersion model:

(a) CALPUFF version 7.3.2, level 200113, used in conjunction with approved CALMET data as provided by the Ministry, when used in a manner as approved by the Director in respect of assessing the Facility's air emissions of the contaminant from all sources of the contaminant at the Facility.

2.4 For the purpose of clause 7 (1) (b) of the Regulation, subject to items 2.5 and 2.6 of this Notice, I am of the opinion that the following combination of dispersion models would predict concentrations of a particulate-based contaminant at least as accurately as an approved dispersion model, when the results of the dispersion models are combined in a manner that is approved by the Director:

(a) CALPUFF version 7.3.2, level 200113, used in conjunction with approved CALMET data as provided by the Ministry, used in respect of assessing the Facility's air emissions of the contaminant from all sources of the contaminant at the Facility, other than the emissions identified in item (b); and

(b) The AERMOD dispersion model referred to in paragraph 1 of subsection 6 (1) of the Regulation used in respect of assessing emissions of the contaminant from the quarry pit at the Facility.

2.5 In respect of the use of the dispersion model specified in item 2.3 and the combination of dispersion models specified in item 2.4 of this Notice, I am of the opinion that the use of the dispersion model and combination of dispersion models would predict concentrations of the contaminant at least as accurately as an approved dispersion model, providing that any removal of the highest eight (8) hours of modelled concentrations of a contaminant when determining the concentration of a contaminant at a point of impingement is not permitted unless it can be demonstrated, to the satisfaction of the Director, that the concentrations proposed to be removed are not attributable to or do not reflect shoreline fumigation.

2.6 For the purpose of clause 7 (1) (d) of the Regulation, I am of the opinion that the following approved dispersion models would predict concentrations of contaminants less accurately than the dispersion model specified under item 2.3 or the combination of dispersion models specified under item 2.4 of this Notice:

(a) The SCREEN3 dispersion model referred to in paragraph 4 of subsection 6 (1) of the Regulation.

(b) The AERMOD dispersion model referred to in paragraph 1 of subsection 6 (1) of the Regulation, except,

(i) when used in the combination of dispersion models specified in item 2.4 of this Notice; or

(ii) when used in respect of all sources of a contaminant, if the contaminant is emitted only from sources of contaminant at the Facility other than the kiln stack.

2.7 This Notice is being issued for the following reasons:

(a) CALPUFF version 7.3.2, level 200113 includes advanced model algorithms for a more comprehensive assessment of the effects of shoreline fumigation on emissions from the kiln stack in combination with emissions from other sources at the Facility and would predict concentrations of contaminants at least as accurately as an approved dispersion model.

(b) The Ministry has provided the Facility with updated, approved CALMET data for use with CALPUFF version 7.3.2, level 200113.

(c) The AERMOD dispersion model referred to in paragraph 1 of subsection 6 (1) of the Regulation includes specialized model algorithms for a more comprehensive assessment of the Facility's particulate-based emissions from the quarry pit.

(d) The shoreline fumigation phenomenon affects emissions of contaminants from the kiln stack but does not generally affect emissions of contaminants from sources at the Facility other than the kiln stack. As such, AERMOD is still an accurate model where the contaminant is only emitted from sources other than the kiln stack. However, as different dispersion models rely upon a different meteorological basis and fundamental equations, combining results from different models is discouraged without a technical justification. As such, the use of the combination of dispersion models in item 2.4 is limited to situations where AERMOD offers a specialized model algorithm relevant to the contaminant being modelled.

(e) The SCREEN3 dispersion model referred to in paragraph 4 of subsection 6 (1) of the Regulation does not predict concentrations of a contaminant from the Facility as accurately as an approved dispersion model due to the number of sources of contaminants at the facility and the lack of model algorithms to predict cumulative concentrations at specific receptor locations.

(f) The Ministry's Air Dispersion Modelling Guideline for Ontario provides that for shorter averaging periods, such as 1-hour concentrations, the eight hours with the highest 1-hour average predicted concentration in each single meteorological year may be discarded as certain extreme, rare and transient metrological conditions may be present in the meteorological data sets that may be considered outliers. However, the CALPUFF model specified in items 2.3 and 2.4 is intended to assess the effects of shoreline fumigation on emissions from the kiln stack in combination with emissions from other sources at the Facility. Higher modeled concentrations of contaminants using the CALPUFF model may not be a

result of meteorological anomalies, but instead may in fact reflect the shoreline fumigation phenomenon. Removal of the highest modeled concentrations of a contaminant, without adequate evidence that the concentrations and meteorological anomalies are not attributable to shoreline fumigation, would defeat the purpose of using the CALPUFF model as specified in items 2.3 and 2.4.

2.8 In accordance with subsection 7 (2) of the Regulation, the Director provided a draft of this Notice to the Person Responsible at the Facility and provided an opportunity for that person to make written submissions to the Director during a thirty (30) day period.

Part 3: Effects of this Notice

3.1 Pursuant to subsection 7 (3) of the Regulation, with the issuance of this Notice, any reference in Part II of the Regulation to an approved dispersion model shall be deemed to:

(a) for any contaminant, include the dispersion model specified in item 2.3 of this Notice, used in accordance with item 2.5 used in respect of assessing the Facility's air emissions of the contaminant from all sources of the contaminant at the Facility;

(b) for particulate-based contaminants, include the combination of dispersion models specified in item 2.4 of this Notice, used in accordance with items 2.5;

(c) not include the dispersion model specified in item 2.6 (a) of this Notice; and

(d) not include the dispersion model specified in item 2.6 (b) except,

(i) when used in the combination of dispersion models specified in item 2.4 of this Notice; or

(ii) when used in respect of all sources of a contaminant, if the contaminant is emitted only from sources of contaminant at the Facility other than the kiln stack.

3.2 This Notice takes effect as of the date determined pursuant to subsections 7 (5) to (9) of the Regulation.

3.3 Subsection 186 (1) of the Act states that every person who contravenes the Act or the regulations is guilty of an offence.

This Notice will expire on December 31, 2032.

Issued this 6th day of May, 2025



Abby Salb
Director, Section 7, O. Reg. 419/05
Environmental Monitoring and Reporting Branch

Ministry of the Environment, Conservation and Parks

Environmental Monitoring and Reporting Branch

125 Resources Road
Etobicoke ON M9P 3V6
Tel.: 416 235-6300

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction de la Surveillance Environnmentale

125, chemin Resources
Etobicoke ON M9P 3V6
Tél. : 416 235-6300

Ontario

May 2, 2025

Joe Frost
Corporate Environmental Specialist
St.Marys Cement Inc.(Canada) –
Bowmanville Facility
410 Bowmanville Avenue S
Municipality of Clarington, Ontario
L1C 7B5

Dear Madam/Sir:

Re: Request for Approval under Paragraph 3 of subsection 13(1) of Regulation 419/05 For use of Site-Specific Meteorological Data: St. Marys Cement Inc. (Canada), Bowmanville Facility (located at 410 Bowmanville Avenue S, Clarington, Ontario)

With respect to the requests made by St. Marys Cement Inc dated August 16th, 2024, and signed by you for approval under paragraph 3 of s.13(1) of O. Reg. 419/05 regarding the use of site-specific meteorological data, I am approving the use of two data sets, as follows: (1) CALMET data set for use with the CALPUFF model, and (2) an AERMET data set for use with the AERMOD model (as applicable) for the above-referenced site, both as approved in the Notice issued under section 7(1) of O.Reg.419/05.

A fully-processed 5-year (2018-2022) CALMET meteorological dataset has been prepared by the Ministry of the Environment, Conservation and Parks (MECP) using the CALMET meteorological pre-processor 6.5.0 (level 150223). CALMET was driven by (1) the Weather Research and Forecast **(WRF)** mesoscale model (version 4.2.1) with the Advanced Research **WRF (ARW)** dynamical core solvers, (2) data from the Oshawa airport, operated and maintained by NavCan**,** (3) data from the Real Time Mesoscale Analysis (RTMA) produced by the National Oceanographic and Atmospheric Association (NOAA), with missing data filled with NOAAs High Resolution Rapid Refresh (HRRR) data for the following locations:

Near the Rundle Rd. station (ID 45201)
Near the Courtice Rd. station (ID 45202)
Near the facility's main kiln stack

and (4) representative terrain and land use specific to the CALMET domain. More details about this dataset are found in the "Description of the CALMET Dataset for St. Marys Cement Inc. (Canada) - Bowmanville" provided by MECP/EMRB, dated September 2024 (Appendix B).

A fully-processed 5-year (2018-2022) AERMET dataset was also prepared by the Ministry of the Environment, Conservation and Parks using the meteorological pre-processor AERMET version 22112 with wind-sector dependent land use, specific to the site identified in the application. This dataset is based on surface and upper air data from the CALMET dataset referenced above and the US NOAA's HRRR data, respectively, both extracted at the closest grid cell to the site. Missing data in the surface file were filled using data from the RTMA and HRRR data. This combination is consistent with the meteorological conditions in the CALMET dataset and is a reasonable reflection of the meteorological conditions for the proposed modelling assessment. This site-specific AERMET dataset must be used in conjunction with the approved version of AERMOD to model discharges from the facility, as described in the Notice issued under section 7(1) and amended under section 52(1) of O.Reg.419/05.

Accordingly, I, the Director appointed under s.5 of the *Environmental Protection Act* for the purposes of paragraph 3 of subsection 13(1) of 0. Reg. 419/05, approve the above-noted meteorological data as an accurate reflection of meteorological and local geophysical (land use and topographic) conditions at the above-referenced facility.

This site-specific meteorological data is approved for use at this specific facility until the date noted below provided that there are no significant changes in land use and other circumstances within 10 km of the facility.

This approval revokes and replaces the approval issued on March 17th, 2021 (as found in Appendix A) and expires on December 31, 2032.

Should you have any comments or questions relating to the above site-specific meteorological dataset, please send an e-mail to MetDataENE@ontario.ca within 30 days of the date of this correspondence with details.

Yours truly,

[redacted]

Abby Salb
Director (A), Section 13, O. Reg. 419/05

cc: District Manager, York-Durham District Office
Director, Section 9, Environmental Protection Act
Ramboll Canada Inc

Appendix A

Ministry of the Environment, Conservation and Parks

Environmental Monitoring and Reporting Branch

125 Resources Road
Etobicoke ON M9P 3V6
Tel.: 416 235-6300
Fax: 416 235-6235

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Direction de la Surveillance Environnmentale

125, chemin Resources
Etobicoke ON M9P 3V6
Tél. : 416 235-6300
Téléc. : 416 235-6235

Ontario

March 17, 2021

Ruben Plaza, Corporate Environmental Manager
St. Marys Cement Inc. (Canada)
55 Industrial Street
Toronto, ON
M4G 3W9

Dear Madam/Sir:

Re: Request for Approval under Paragraph 3 of subsection 13(1) of Regulation 419/05 For use of Site-Specific Meteorological Data: St. Marys Cement Inc. (Canada) – Bowmanville Cement Plant (located at 410 Bowmanville Avenue, Municipality of Clarington, Ontario)

This is with respect to the request made by St. Marys Cement Inc. (Canada) dated February 26, 2021 and signed by you for approval under paragraph 3 of s.13(1) of O. Reg. 419/05 of site-specific meteorological data for the above-referenced site.

The methodology proposed to develop the meteorological data for the above-referenced site and the justification for using CALMET version 6.5.0, level 150223 was acceptable for the following reasons:

1. the land use characterization is representative for the purpose of this approval;
2. the gridded meteorological data used as key input to CALMET comes from an acceptable meso-scale meteorological model, namely, the Nonhydrostatic Mesoscale Model version of the Weather Research and Forecasting (WRF-NMM) model;
3. the observed meteorological data from the Courtice, Rundle stations (administered by Region of Durham), and Cobourg, and Oshawa stations (administered by Environment and Climate Change Canada) is used in refining the CALMET results for the purpose of this approval;
4. the options chosen in the CALMET input file are reasonable; and
5. the CALMET results are reasonable.

Accordingly, I, the Director appointed under s.5 of the *Environmental Protection Act* for the purposes of section 13 of O. Reg. 419/05, approve the above-noted site-specific meteorological data as an accurate reflection of meteorological and local land use conditions at St. Marys Cement Inc. (Canada) – Bowmanville Cement Plant (located at 410 Bowmanville Avenue, Municipality of Clarington, Ontario).

This approval expires on March 17, 2031.

Should you have any comments or questions relating to the above site-specific meteorological dataset, please send an e-mail to MetDataENE@ontario.ca within 30 days of the date of this correspondence with details, so that this dataset can be modified, if necessary.

Yours truly,

[redacted]

Yvonne Hall
Director, Section 13, O. Reg. 419/05

cc: District Manager, York-Durham District Office
Director, Section 9, Environmental Protection Act
Environmental Permissions Branch
BCX Environmental Consulting

Appendix H
SUPPORTING DOCUMENTATION

Sensitive information has been redacted