St. Marys Cement Inc. (Canada)
Bowmanville Facility

Annual Compliance Report 2025
(ECA No. 0550-CEAHMA)

Site Location:

410 Bowmanville Avenue
Bowmanville, Ontario
L1C 7B5

June 2026

INTRODUCTION

This annual compliance report has been prepared by St. Marys Cement Inc. (Canada) (SMC) in accordance with Condition 16.1 of their Environmental Compliance Approval (ECA No.0550-CEAHMA, dated September 19, 2022) for their cement plant located at 410 Bowmanville Avenue in Bowmanville, Ontario (Bowmanville Facility) for the 2025 calendar year.

Condition 16.1 of the ECA states that:

Excerpt from the ECA

"The Company shall prepare and submit by June 30 of each year to the District Manager, an Annual Report summarizing the operation of the Facility, covering the previous calendar year. The Annual Report shall include, as a minimum, the following information:

- *a) a statement of whether the Facility was in compliance with this Approval, including compliance with the Performance Limits;*
- *b) the Emission Summary Table and Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;*
- *c) clinker and cement production in tonnes per year;*
- *d) maximum daily feed rate and average daily feed rate of Alternative Low-Carbon Fuels and Conventional Fuels in the Cement Kiln for each month of the preceding calendar year, and the weight percentage of each category of Alternative Low-Carbon Fuels approved under Condition 7 of this Approval, of the total monthly Alternative Low-Carbon Fuel used.*
- *e) maximum and average percent thermal replacement of Conventional Fuels by combined Alternative Low-Carbon Fuels for each month;*
- *f) a summary of data from CEM System, CPM System, Source Testing and Carbon Dioxide Emission Intensity testing described under conditions 10.3(a) and (b), 11 and 12 of this Approval, and a description of the status of compliance with the Performance Limits, Alternative Low-Carbon Fuel definition under this Approval and Alternative Low-Carbon Fuels operational requirements described in Schedule E of this Approval;*
- *g) a summary of dates, duration and reasons for any operational events including but not limited to events described in condition 8.7 of this Approval that may have negatively impacted the quality of the environment and corrective measures taken to address these impacts;*
- *h) details of environmental complaints including a summary of complaints received, causes of complaints and action taken to avoid the recurrence of similar incidents, as described in condition 14 of this Approval."*

This report has been divided into eight separate sections (Sections A to H) to address Conditions 16.1 a) through h), respectively, as described above.

SECTION A

This Section addresses Condition 16.1a) of the ECA described as below:

"Statement of whether the Facility was in compliance with this Approval, including compliance with the Performance Limits."

st marys cement

St Marys Cement
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June 30, 2026

Ministry of the Environment, Conservation and Parks (MECP)
Director, Client Services and Permissions Branch
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

Re: Statement of Facility Operations within Performance Limits 2025
Environmental Compliance Approval with Limited Operational Flexibility
(ECA Number 0550-CEAHMA)

This is to confirm that St. Marys Cement Inc. (Canada)'s (St. Mary's) Bowmanville Cement Plant, located at 410 Bowmanville Avenue in Bowmanville, Ontario (Facility), during the 2025 Calendar Year, operated in material compliance with Section 9 of the Environmental Protection Act, and with the conditions of our Environmental Compliance Approval (ECA) with Limited Operational Flexibility (LOF), including the Performance Limits set forth in Condition 4 of the ECA with the exception of the following:

- Exceedance of the B1 of SO2 1-hr; and
- Exceedance of the B1 of NOx 1-hr and 24-hr; and
- Exceedance of the O.reg 419/05, Section 46, opacity 6-min rolling average.

The Facility is currently working with the MECP on the implementation of abatement action plans for NOx and SO_2.

Sincerely,

Joe Frost
Environmental Manager,
Bowmanville Facility
St. Marys Cement / Votorantim Cimentos North America
905-623-3341 extension 248
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SECTION B

This Section addresses Condition 16.1b) of the ECA described as below:

"The Emission Summary Table and Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year".

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 [%]
					Avg. Period Emission Rate	Avg. Period POI Concentration	Value [µg/m³]	Limiting Effect	ACB Source(2)	Category	
Criteria Air Contaiminants											
PM	PM	1.44E+01	AERMOD v24142 & CALPUFF v7.3.2	106.92	24 hr	24 hr	120	Visibility	S	B1	89%
RCS	14808-60-7	1.54E-01	AERMOD v24142 & CALPUFF v7.3.2	2.04	24 hr	24 hr	5	Health	G	B1	41%
Nitrogen Oxides	10102-44-0	9.43E+01	CALPUFF v7.3.2	3.62E+02	1 hr	1 hr	400	Health	S	B1	90%
Nitrogen Oxides	10102-44-0	9.38E+01	CALPUFF v7.3.2	7.67E+01	24 hr	24 hr	200	Health	S	B1	38%
Sulphur Dioxide	7446-09-5	1.26E+01	CALPUFF v7.3.2	4.83E+01	1 hr	1 hr	100	Health & Vegetation	S	B1	48%
Sulphur Dioxide	7446-09-5	1.26E+01	CALPUFF v7.3.2	3.86E-01	Annual	Annual	10	Health & Vegetation	S	B1	4%
Carbon Monoxide	630-08-0	1.27E+02	CALPUFF v7.3.2	3.46E+03	1 hr	0.5 hr	6000	Health	S	B1	58%
Hydrogen Chloride	7647-01-0	1.90E+00	CALPUFF v7.3.2	1.55E+00	24 hr	24 hr	20	Health	S	B1	8%
Ammonia	7664-41-7	6.94E+00	CALPUFF v7.3.2	5.67E+00	24 hr	24 hr	100	Health	S	B1	6%
Metals											
Antimony	7440-36-0	1.27E-05	CALPUFF v7.3.2	1.91E-04	24 hr	24 hr	25	Health	S	B1	<0.1%
Arsenic	7440-38-2	3.24E-04	CALPUFF v7.3.2	1.52E-03	24 hr	24 hr	0.3	Health	G	B1	1%
Barium	7440-39-3	3.39E-03	CALPUFF v7.3.2	1.85E-02	24 hr	24 hr	10	Health	G	B1	0.2%
Beryllium	7440-41-7	5.64E-05	CALPUFF v7.3.2	6.03E-05	24 hr	24 hr	0.01	Health	S	B1	1%
Cadmium	7440-43-9	6.88E-05	CALPUFF v7.3.2	7.76E-05	24 hr	24 hr	0.025	Health	S	B1	0%
Chromium	7440-47-3	3.64E-03	CALPUFF v7.3.2	5.65E-02	24 hr	24 hr	0.5	Health	S	B1	11%
Cobalt	7440-48-4	2.05E-04	CALPUFF v7.3.2	1.26E-03	24 hr	24 hr	0.1	Health	G	B1	1%
Copper	7440-50-8	1.25E-03	CALPUFF v7.3.2	1.02E-03	24 hr	24 hr	50	Health	S	B1	<0.1%
Iron	7439-89-6	1.99E-01	CALPUFF v7.3.2	2.12E+00	24 hr	24 hr	4	Health & Soiling	S	B1	53%
Ferric Oxide	1309-37-1	2.85E-01	CALPUFF v7.3.2	3.03E+00	24 hr	24 hr	25	Health & Soiling	S	B1	12%
Lead	7439-92-1	2.45E-03	CALPUFF v7.3.2	2.28E-03	24 hr	24 hr	0.5	Health	S	B1	0%
Lead	7439-92-1	2.45E-03	CALPUFF v7.3.2	8.79E-04	24 hr	30 day	0.2	Health	S	B1	0%
Manganese	7439-96-5	2.96E-02	CALPUFF v7.3.2	6.00E-02	24 hr	24 hr	0.4	Health	S	B1	15%
Mercury	7439-97-6	7.52E-04	CALPUFF v7.3.2	6.17E-04	24 hr	24 hr	2	Health	S	B1	<0.1%
Molybdenum	7439-98-7	1.13E-03	CALPUFF v7.3.2	9.23E-04	24 hr	24 hr	120	Particulate	G	B1	<0.1%
Nickel	7440-02-0	4.29E-03	CALPUFF v7.3.2	1.14E-02	Annual	Annual	0.04	Health	S	B1	28%
Nickel	7440-02-0	4.29E-03	CALPUFF v7.3.2	1.14E-02	24 hr	Annual	0.4	Health	MECP bulletin	AAV	3%
Nickel	7440-02-0	4.29E-03	CALPUFF v7.3.2	6.55E-02	24 hr	24 hr	2	Health	MECP bulletin	URT/DAV	3%
Selenium	7782-49-2	5.66E-04	CALPUFF v7.3.2	4.65E-04	24 hr	24 hr	10	Health	G	B1	<0.1%
Silver	7440-22-4	2.14E-04	CALPUFF v7.3.2	1.78E-04	24 hr	24 hr	1	Health	S	B1	<0.1%
Tin	7440-31-5	1.36E-04	CALPUFF v7.3.2	2.15E-03	24 hr	24 hr	10	Health	S	B1	<0.1%
Thallium	7440-28-0	6.35E-05	CALPUFF v7.3.2	5.19E-05	24 hr	24 hr	0.5	Health	SL-JSL	B2	<0.1%
Vanadium	7440-62-2	1.41E-03	CALPUFF v7.3.2	7.74E-03	24 hr	24 hr	2	Health	S	B1	0%
Zinc	7440-66-6	3.96E-03	CALPUFF v7.3.2	3.24E-03	24 hr	24 hr	120	Particulate	S	B1	<0.1%
Volatile Organic Matter											
Acetaldehyde	75-07-0	8.58E-01	CALPUFF v7.3.2	7.01E-01	24 hr	24 hr	500	Health	S	B1	0%
Acetaldehyde	75-07-0	8.58E-01	CALPUFF v7.3.2	8.47E+00	0.5 hr	0.5 hr	500	Health	S	B1	2%
Acetone (2-Propanone)	67-64-1	5.06E-02	CALPUFF v7.3.2	4.13E-02	24 hr	24 hr	11880	Health	S	B1	<0.1%
Acrolein	107-02-8	7.24E-02	CALPUFF v7.3.2	5.91E-02	24 hr	24 hr	0.4	Health	S	B1	15%
Acrolein	107-02-8	7.24E-02	CALPUFF v7.3.2	5.88E-01	1 hr	1 hr	4.5	Health	S	B1	13%
Benzene	71-43-2	3.56E-01	CALPUFF v7.3.2	1.08E-02	Annual	Annual	0.45	Health	S	B1	2%
Benzene	71-43-2	3.56E-01	CALPUFF v7.3.2	1.08E-02	24 hr	Annual	4.5	Health	MECP bulletin	AAV	0%
Benzene	71-43-2	3.56E-01	CALPUFF v7.3.2	2.91E-01	24 hr	24 hr	100	Health	MECP bulletin	URT/DAV	0.3%
Bromodichloromethane	75-27-4	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	350	Health	SL-JSL	B2	<0.1%
Bromoform	75-25-2	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	55	Health	G	B1	<0.1%
Bromomethane	74-83-9	2.13E-02	CALPUFF v7.3.2	1.74E-02	24 hr	24 hr	1350	Health	G	B1	<0.1%
1,3-Butadiene	106-99-0	6.73E-02	CALPUFF v7.3.2	2.05E-03	Annual	Annual	2	Health	S	B1	0%
1,3-Butadiene	106-99-0	6.73E-02	CALPUFF v7.3.2	2.05E-03	24 hr	Annual	20	Health	MECP bulletin	AAV	<0.1%
1,3-Butadiene	106-99-0	6.73E-02	CALPUFF v7.3.2	5.50E-02	24 hr	24 hr	300	Health	MECP bulletin	URT/DAV	<0.1%
Methyl Ethyl Ketone (2-Butan	78-93-3	3.12E-02	CALPUFF v7.3.2	2.55E-02	24 hr	24 hr	1000	Health	S	B1	<0.1%
Carbon tetrachloride	56-23-5	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	2.4	Health	S	B1	1%
Chloroform	67-66-3	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	1	Health	S	B1	1%
Cumene	98-82-8	3.95E-02	CALPUFF v7.3.2	3.23E-02	24 hr	24 hr	400	Health	S	B1	<0.1%
Dibromochloromethane	124-48-1	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	0.2	Health	SL-JSL	B2	7%
Dichlorodifluoromethane	75-71-8	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	500000	Health	G	B1	<0.1%
1,2-Dichloroethane	107-06-2	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	2	Health	S	B1	1%
1,1-Dichloroethene	75-35-4	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	10	Health	S	B1	0.1%
trans-1,2-Dichloroethylene	156-60-5	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	105	Health	G	B1	<0.1%
1,2-Dichloropropane	78-87-5	1.64E-02	CALPUFF v7.3.2	1.34E-02	24 hr	24 hr	2400	Odour	G	B1	<0.1%
Ethylbenzene	100-41-4	5.37E-02	CALPUFF v7.3.2	7.21E-01	10 min	10 min	1900	Odour	G	B1	<0.1%
Ethylene dibromide	106-93-4	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	3	Health	G	B1	0.4%
Ethylene glycol	107-21-1	4.50E-01	AERMOD v22112	6.12E+00	24 hr	24 hr	12700	Health	G	B1	<0.1%
Mesitylene	108-67-8	2.02E-01	CALPUFF v7.3.2	1.65E-01	24 hr	24 hr	220	Health	S	B1	<0.1%
Methanol	67-56-1	2.50E+00	CALPUFF v7.3.2	2.04E+00	24 hr	24 hr	4000	Health	S	B1	<0.1%
Methylene chloride	75-09-2	2.71E-01	CALPUFF v7.3.2	2.21E-01	24 hr	24 hr	220	Health	S	B1	0%
Phenol	108-95-2	2.50E+00	CALPUFF v7.3.2	2.04E+00	24 hr	24 hr	30	Health	S	B1	7%
Propionaldehyde	123-38-6	2.89E-01	CALPUFF v7.3.2	3.88E+00	10 min	10 min	10	Odour	G	B1	39%
Styrene	100-42-5	8.73E-02	CALPUFF v7.3.2	7.14E-02	24 hr	24 hr	400	Health	S	B1	<0.1%
1,1,1,2-Tetrachloroethane	630-20-6	6.59E-03	CALPUFF v7.3.2	5.38E-03	24 hr	24 hr	0.5	Health	SL-JSL	B2	1%
1,1,2,2-Tetrachloroethane	79-34-5	6.97E-03	CALPUFF v7.3.2	5.70E-03	24 hr	24 hr	0.1	Health	SL-JSL	B2	5.7%
Toluene	108-88-3	2.29E-01	CALPUFF v7.3.2	1.87E-01	24 hr	24 hr	2000	Odour	G	B1	<0.1%
1,1,1-Trichloroethane	71-55-6	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	115000	Health	S	B1	<0.1%
Trichloroethylene	79-01-6	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	12	Health	S	B1	0%
Vinyl chloride	75-01-4	1.96E-02	CALPUFF v7.3.2	1.60E-02	24 hr	24 hr	1	Health	S	B1	2%
Trichlorotrifluoroethane	76-13-1	5.25E-03	CALPUFF v7.3.2	4.29E-03	24 hr	24 hr	800000	Health	S	B1	<0.1%
Trichlorofluoromethane	75-69-4	1.62E-02	CALPUFF v7.3.2	1.32E-02	24 hr	24 hr	6000	Health	G	B1	<0.1%
Xylenes	1330-20-7	2.25E-01	CALPUFF v7.3.2	3.02E+00	10 min	10 min	3000	Odour	G	B1	0%
Dioxins, Furans and Dioxin-like PCBs											
Dioxins, Furans and Dioxin-lik	CDD	5.98E-09	CALPUFF v7.3.2	4.88E-09	24 hr	24 hr	0.1 pg TEQ/m3	Health	S	B1	5%

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 [%]
					Avg. Period Emission Rate	Avg. Period POI Concentration	Value [µg/m³]	Limiting Effect	ACB Source(2)	Category	
Polycyclic Aromatic Hydrocarbons (PAHs)											
Acenaphthylene	208-96-8	2.85E-03	CALPUFF v7.3.2	2.33E-03	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	2%
Acenaphthene	83-32-9	9.33E-04	CALPUFF v7.3.2	7.62E-04	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	1%
Anthracene	120-12-7	1.60E-04	CALPUFF v7.3.2	1.31E-04	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	0%
Benzo(a)anthracene	56-55-3	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Benzo(b)fluoranthene	205-99-2	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Benzo(k)fluoranthene	207-08-9	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Benzo(a)fluorene	238-84-6	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Benzo(b)fluorene	243-17-4	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Benzo(g,h,i)perylene	191-24-2	2.54E-05	CALPUFF v7.3.2	2.08E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Benzo(a)pyrene	50-32-8	2.54E-05	CALPUFF v7.3.2	7.73E-07	Annual	Annual	0.00001	Health	S	B1	8%
Benzo(a)pyrene	50-32-8	2.54E-05	CALPUFF v7.3.2	7.73E-07	24 hr	Annual	0.0001	Health	MECP bulletin	AAV	1%
Benzo(a)pyrene	50-32-8	2.54E-05	CALPUFF v7.3.2	2.08E-05	24 hr	24 hr	0.005	Health	MECP bulletin	URT/DAV	0.4%
Benzo(e)pyrene	192-97-2	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
2-Chloronaphthalene	91-58-7	1.19E-03	CALPUFF v7.3.2	9.68E-04	24 hr	24 hr	1	Health	SL-JSL	B2	<0.1%
Chrysene	218-01-9	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Coronene	191-07-1	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Dibenzo(a,c)anthracene	215-58-7	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
9,10-Dimethylanthracene	781-43-1	2.03E-05	CALPUFF v7.3.2	1.66E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
7,12-Dimethylbenzo(a)anthra	57-97-6	5.80E-05	CALPUFF v7.3.2	4.74E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Fluoranthene	206-44-0	8.62E-05	CALPUFF v7.3.2	7.04E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Fluorene	86-73-7	1.16E-03	CALPUFF v7.3.2	9.48E-04	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	0.9%
Indeno(1,2,3-cd)pyrene	193-39-5	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
2-Methylanthracene	613-12-7	1.08E-03	CALPUFF v7.3.2	8.82E-04	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	1%
3-Methylcholanthrene	56-49-5	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
1-Methylnaphthalene	90-12-0	4.64E-02	CALPUFF v7.3.2	3.79E-02	24 hr	24 hr	35.5	Health	SL-JSL	B2	0%
2-Methylnaphthalene	91-67-6	4.17E-02	CALPUFF v7.3.2	3.41E-02	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	34%
1-Methylphenanthrene	832-69-9	3.46E-03	CALPUFF v7.3.2	2.83E-03	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	3%
9-Methylphenanthrene	883-20-5	2.11E-03	CALPUFF v7.3.2	1.72E-03	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	2%
Naphthalene	91-20-3	8.94E-02	CALPUFF v7.3.2	7.30E-02	24 hr	24 hr	22.5	Health	G	B1	0.3%
Naphthalene	91-20-3	8.94E-02	CALPUFF v7.3.2	1.20E+00	10 min	10 min	50	Odour	G	B1	2%
Perylene	198-55-0	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Phenanthrene	85-01-8	6.29E-03	CALPUFF v7.3.2	5.14E-03	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	5%
Picene	213-46-7	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Pyrene	129-00-0	4.27E-05	CALPUFF v7.3.2	3.49E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%
Tetralin	119-64-2	2.53E-02	CALPUFF v7.3.2	2.07E-02	24 hr	24 hr	151.5	Health	SL-JSL	B2	<0.1%
Triphenylene	217-59-4	1.45E-05	CALPUFF v7.3.2	1.18E-05	24 hr	24 hr	0.1	-	-	De Minimus Table B-2A	<0.1%

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. $CaCO_3$ 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, PC - Portland Cement

(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) MECP's procedure for the removal of meterological anomalies was applied for NO_X (1hr), and SO_2 (1hr) (ADMGO, February 2017).

St. Marys Cement Bowmanville Cement Plant Acoustic Assessment Summary Tables

As of December 31, 2025

Table 1: Acoustic Assessment Summary Table - Non-Emergency Equipment

Point of Reception	Point of Reception Description	Sound Level at Point of Reception, LEQ [dBA]	Performance Limit, LEQ [dBA]	Compliance with Performance Limit	Acoustical Classification Area	Verified by Acoustic Audit
R1	Two storey home approx. 1450 m southeast of cement plant	42	50	Yes	Class 2	No
R3	Non-conforming single storey home approx. 350 m north of cement plant	50	50	Yes	Class 1	No
VL1	Vacant residential lot approx. 1490 m southeast of cement plant	41	50	Yes	Class 2	No

Table 2: Acoustic Assessment Summary Table - Emergency Equipment

Point of Reception	Point of Reception Description	Sound Level at Point of Reception, LEQ [dBA]	Performance Limit, LEQ [dBA]	Compliance with Performance Limit	Acoustical Classification Area	Verified by Acoustic Audit
R1	Two storey home approx. 1450 m southeast of cement plant	16	50	Yes	Class 2	No
R3	Non-conforming single storey home approx. 350 m north of cement plant	31	50	Yes	Class 1	No
VL1	Vacant residential lot approx. 1490 m southeast of cement plant	21	50	Yes	Class 2	No

SECTION C

This Section addresses Condition 16.1c) of the ECA described as below:

“Clinker and cement production in tonnes per year”.

SECTION D

This Section addresses Condition 16.1d) of the ECA described as below:

“Maximum daily feed rate and average daily feed rate of Alternative Low-Carbon Fuels and Conventional Fuels in the Cement Kiln for each month of the preceding calendar year, and the weight percentage of each category of Alternative Low-Carbon Fuels approved under Condition 7 of this Approval, of the total monthly Alternative Low-Carbon Fuel used.”

St. Mary's Cement
410 Bowmanville Ave, Bowmanville, ON, L1C 7B5

Annual Report Condition 16.1d

	Condition 7 ALCFs Weight Percentage of Total ALCF for Month							
					Conventional Fuel		ALCF	
2025 Month	a. 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	b. Material that is comprised of non-recyclable plastics, including but not limited to manufacturing rejects, material resource recovery facility rejects, plastics bags and packaging	c. Material that is comprised of construction, renovation & demolition waste, including but not limited to scrap wood, treated lumber, carpets, textiles, sawdust, floor laminates and asphalt shingles	d. 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, end rolls and cores.	Maximum Daily Feed Rate (tonnes)	Average Daily Feed Rate (tonnes)	Maximum Daily Feed Rate (tonnes)	Average Daily Feed Rate (tonnes)
Jan	63%	37%	0%	0%	785	381	182	54
Feb	67%	33%	0%	0%	652	419	192	70
Mar	18%	82%	0%	0%	501	74	140	7
Apr	28%	72%	0%	0%	443	136	169	23
May	85%	15%	0%	0%	1462	428	227	113
Jun	65%	35%	0%	0%	1082	177	201	80
Jul	65%	35%	0%	0%	580	359	206	50
Aug	83%	17%	0%	0%	2941	473	238	76
Sep	80%	20%	0%	0%	2771	484	240	53
Oct	76%	24%	0%	0%	668	491	144	67
Nov	100%*	0%	0%	0%	1561	611	159	87
Dec	89%	11%	0%	0%	730	468	166	69

* Adjusted to 100%. Original values was 125% due to month end inventory adjustment.

SECTION E

This Section addresses Condition 16.1e) of the ECA described as below:

“Maximum and average percent thermal replacement of Conventional Fuels by combined Alternative Low-Carbon Fuels for each month.”

CEMView
by Nexus Solutions Inc.

St. Mary's Cement
410 Bowmanville Ave, Bowmanville, ON, L1C 7B5

Annual Report Condition 16.1e

Thermal Replacement of Conventional e. Fuels by Combined Alternative Low-Carbon Fuels (%)												
2025	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Avg. %	5%	6%	1.5%	3%	11%	8%	5%	7%	5%	7%	7%	7%
Max. %	16%	16%	37%	22%	24%	29%	21%	20%	19%	14%	13%	18%
Min. %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

SECTION F

This Section addresses Condition 16.1f) of the ECA described as below:

"A summary of data from CEM System, CPM System, Source Testing and Carbon Dioxide Emission Intensity testing described under conditions 10.3(a) and (b), 11 and 12 of this Approval, and a description of the status of compliance with the Performance Limits, Alternative Low-Carbon Fuel definition under this Approval and Alternative Low-Carbon Fuels operational requirements described in Schedule E of this Approval."

St. Mary's Bowmanville Cement Plant, located at 410 Bowmanville Avenue in Bowmanville, Ontario (Facility), during the 2025 Calendar Year, operated in material compliance with the Performance Limits and complied with the Alternative Low-Carbon Fuel definitions under the Environmental Compliance Approval 0550-CEAHMA, dated September 19, 2022 (ECA) and ALCF operational requirements described in Schedule E of this ECA except where noted in Section A of this report.

A summary of data from CEM System, CPM System, Source Testing and Carbon Dioxide Emission Intensity testing described under conditions 10.3(a) and (b), 11 and 12 of the ECA is enclosed.

CEM Data Summary

St. Mary's Cement
410 Bowmanville Ave, Bowmanville, ON, L1C 7B5

Annual Report Condition 16.1F-Summary of CPM Data

2025	TPM @ 11% O2, Daily				NOx, Daily				SO2, Daily			
	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability
	mg/Nm³			%	ppmv			%	ppmv			%
January	15	8	40	83	120	1	213	85	6	0	17	85
February	22	8	98	97	100	43	130	98	4	0	13	98
March	24	13	32	95	115	85	149	95	2	0	11	95
April	11	6	18	100	87	1	163	100	3	0	10	100
May	7	5	14	99	138	102	163	99	11	0	21	99.6
June	12	4	41	98	110	2	160	96	8	0	21	92
July	8	4	20	99	126	3	179	96	13	0	29	91
August	5	4	21	98	134	24	151	94	17	3	30	92
September	6	4	15	92	125	35	155	98	13	3	22	93
October	6	4	19	99	122	41	140	98	15	3	22	95
November	5	4	9	83	121	113	129	99	15	11	19	93
December	9	3	36	83	113	86	131	84	15	6	78	93

CPM Data Summary

St. Mary's Cement
410 Bowmanville Ave, Bowmanville, ON, L1C 7B5

Annual Report Condition 16.1F-Summary of CPM Data

2025	Residual O2, Backend of Kiln				Residual O2, Calciner Downcomer Duct				CO, Backend of Kiln				CO, Calciner Downcomer Duct			
	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability
	%			%	%			%	ppm			%	ppm			%
January	11	4	21	100	10	5	21	100	1.74E-05	1.00E-05	2.90E-05	100	620	220	838	100
February	12	4	21	100	9	5	18	100	8.36E-06	0.00E00	1.00E-05	100	589	5	938	100
March	20	18	21	100	8	6	13	100	0.00E00	0.00E00	0.00E00	100	469	239	620	100
April	13	7	21	100	11	6	21	100	1.07E-02	1.46E-04	1.00E-01	100	1132	95	7699	100
May	10	5	21	100	12	5	21	100	4.03E-03	2.90E-05	3.39E-02	100	472	130	716	100
June	14	7	21	100	7	5	13	100	1.05E-02	2.00E-05	5.54E-02	100	785	576	990	100
July	14	7	22	97	9	5	15	96	7.38E-03	2.90E-05	2.78E-02	97	887	279	1398	96
August	11	6	21	100	7	5	10	100	3.20E-03	2.90E-05	3.25E-02	100	266	6	953	100
September	11	5	15	100	6	5	7	100	2.90E-05	2.90E-05	2.90E-05	100	729	301	911	100
October	11	6	20	97	7	4	10	99	5.19E-04	0.00E00	5.92E-03	97	752	657	894	99
November	10	6	20	100	8	6	13	100	6.00E-03	1.48E-03	2.95E-02	100	806	597	941	100
December	15	6	21	100	7	5	10	100	1.61E-02	1.22E-03	1.10E-01	100	838	693	1104	100

2025	Temperature, K5				Temperature, C5				THC			
	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability	Average	Minimum	Maximum	Availability
	°C			%	°C			%	ppmv			%
January	746	21	833	100	898	896	898	100	81	2	127	94
February	800	673	835	100	898	897	901	100	97	15	183	57
March	811	801	824	100	899	898	901	100	64	46	88	96
April	586	4	824	100	895	858	902	100	55	2	93	100
May	818	781	833	100	898	897	898	100	105	55	139	100
June	677	23	841	100	898	895	899	100	95	3	185	100
July	770	71	836	97	895	892	898	96	99	9	140	85
August	816	596	836	100	893	892	895	100	130	14	171	100
September	810	667	830	100	895	892	898	100	129	42	203	100
October	809	582	831	97	894	893	894	99	127	9	169	99
November	824	812	832	100	894	894	895	100	133	85	165	100
December	817	782	830	100	894	893	895	100	100	28	138	81

Compliance Source Testing Data Summary

Table 1 - Sampling Parameters and Methods
Kiln Stack

Source Location	No. of Tests	Sampling Parameter	Sampling Method
Kiln Stack	6	Velocity, Temperature and Flow Rate	OSTC [1] Methods 1-4
	3	Particulate Matter	OSTC [1] Method 5
	3	Metals	U.S. EPA [2] Method 29
	3	SVOC's, Dioxins and Furans	Environment Canada Method EPS 1/RM/2
	3	Aldehydes	NCASI[3] Method A105
	3	HCl and Ammonia	U.S. EPA[2] Method 26A (isokinetic)
	3	Methanol and Phenol	NCASI[3] Method 98.01
	3	Volatile Organic Matter	U.S. EPA[2] SW 846 0030 VOST
	3	Carbon Monoxide	US EPA[2] Method 10
	3	Oxygen and Carbon Dioxide	US EPA[2] Method 3A

Notes:

[1] OSTC - Ontario Source Testing Code - Version 3

[2] U.S. EPA - United States Environmental Protection Agency

[3] NCASI - National Council for Air and Stream Improvement

Table 2: Sampling Summary and Sample Log

Kiln Stack

Source and Test #	Sampling Date	Start Time	End Time	Filter ID / Trap ID	Lab Sample ID
Velocity / Metals / Mercury					
Test #1	13-Aug-25	7:57 AM	12:43 PM	QZ12940	BU2502330-001
Test #2	20-Aug-25	10:03 AM	2:55 PM	QZ12997	BU2502330-002
Test #3	21-Aug-25	8:53 AM	5:56 PM	QZ13344	BU2502330-003
Velocity / Dioxins and Furans					
Test #1	13-Aug-25	7:57 AM	12:43 PM	BU02025_002_AA	BU2502329-001
Test #2	20-Aug-25	10:03 AM	2:55 PM	BU02025_003_AA	BU2502329-002
Test #3	22-Aug-25	10:27 AM	2:44 PM	BU02025_004_AA	BU2502329-003
HCl and Ammonia					
Test #1	12-Aug-25	12:01 PM	2:28 PM	-	BU2502326-001
Test #2	12-Aug-25	4:06 PM	6:30 PM	-	BU2502326-002
Test #3	20-Aug-25	3:53 PM	6:16 PM	-	BU2502326-003
Methanol and Phenol					
Test #1	12-Aug-25	4:55 PM	5:55 PM	-	25080240-01
Test #2	13-Aug-25	10:02 AM	11:02 AM	-	25080240-02
Test #3	13-Aug-25	11:26 AM	12:26 PM	-	25080240-03
Aldehydes					
Test #1	20-Aug-25	10:47 AM	11:47 AM	-	BU2502327-001
Test #2	20-Aug-25	1:11 PM	2:11 PM	-	BU2502327-002
Test #3	20-Aug-25	3:15 PM	4:15 PM	-	BU2502327-003
VOST					
Test #1	20-Aug-25	10:17 AM	11:17 AM	A097847 + A089974	140-43476-1, 140-43476-2
Test #2	20-Aug-25	1:10 PM	2:10 PM	A098084 + A089967	140-43476-3, 140-43476-4
Test #3	20-Aug-25	3:15 PM	4:17 PM	A088697 + A098001	140-43476-5, 140-43476-6

Table 3: Sampling Summary - Flow Characteristics
Kiln Stack

Stack Gas Parameter		Test No. 1			Test No. 2			Test No. 3			TOTAL AVERAGE
		PM, Metals	D and F [1]	Average	PM, Metals	D and F [1]	Average	PM, Metals	D and F [1]	Average	Average
Testing Date											-
Stack Temperature	°F	129	130	129	128	130	129	127	129	128	**129**
	°C	54	54	54	53	55	54	53	54	54	**54**
Moisture	%	14.3%	15.5%	14.9%	13.8%	13.8%	13.8%	13.6%	13.8%	13.7%	**14.1%**
Velocity	ft/s	53.5	54.7	54.1	52.5	50.5	51.5	55.5	53.5	54.5	**53.4**
	m/s	16.3	16.7	16.5	16.0	15.4	15.7	16.9	16.3	16.6	**16.3**
Actual Flow Rate	CFM	816962	834949	825955	801128	771788	786458	847577	817461	832519	**814977**
Referenced Flow Rate[2]	CFM	624122	628072	626097	618700	593588	606144	659764	631805	645784	**626009**
	m^3/s	294	296	295	292	280	286	311	298	305	**295**
Sampling Isokinetic Rate	%	101	102	102	99	100	99	99	98	99	**100**

Notes *:*

[1] D and F = Dioxins, Furans, and Dioxin-like PCBs

[2] Referenced flow rate expressed as dry at 101.3 kPa, 25°C, and Actual Oxygen

Detailed sampling results including individual test results can be found in Appendix B and C

Table 4: PM, Metals and Mercury[1] - Averaged Results
Kiln Stack

Parameter	Concentration [2]	Concentration @ 11% O_2 [3]	Concentration @ 0°C, 10% O_2 [4]	Emission Rate
Particulate	**(mg/m^3)**	**(mg/m^3)**	**(mg/m^3)**	**(mg/s)**
Particulate Matter	5.41	8.37	10.1	1620
Metals	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**(mg/s)**
Combined Train Arsenic (As)	< 0.311	< 0.481	< 0.578	< 0.0931
Combined Train Barium (Ba)	2.65	4.1	4.93	0.804
Combined Train Beryllium (Be)	< 0.0623	< 0.0964	< 0.116	< 0.0186
Combined Train Cadmium (Cd)	< 0.0311	< 0.0481	< 0.0578	< 0.00931
Combined Train Chromium (Cr)	4.21	6.51	7.83	1.24
Combined Train Cobalt (Co)	< 0.0806	< 0.125	< 0.15	< 0.024
Combined Train Copper (Cu)	4.23	6.54	7.86	1.25
Combined Train Lead (Pb)	< 0.464	< 0.718	< 0.863	< 0.137
Combined Train Manganese (Mn)	8.31	12.9	15.4	2.47
Combined Train Molybdenum (Mo)	3.76	5.82	6.99	1.13
Combined Train Nickel (Ni)	2.71	4.19	5.04	0.801
Combined Train Selenium (Se)	< 0.623	< 0.964	< 1.16	< 0.186
Combined Train Silver (Ag)	< 0.0869	< 0.134	< 0.162	< 0.0259
Combined Train Thallium (Tl)	< 0.067	< 0.104	< 0.125	< 0.02
Combined Train Vanadium (V)	< 0.311	< 0.481	< 0.578	< 0.0931
Combined Train Zinc (Zn)	9.27	14.3	17.2	2.76
Mercury	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**(mg/s)**
Total Mercury	< 0.692	< 1.07	< 1.29	< 0.207

Notes:

[1] Sampling followed OSTC Method 5 (PM) and U.S. EPA Method 29 (Metals)

[2] Referenced concentration values are expressed at 101.3kPa, 25 ^{o} C, actual oxygen

[3] Referenced concentration values are expressed at 101.3kPa, 25 ^{o} C, at 11% O_2

[4] Referenced concentration values are expressed at 101.3kPa, 0 ^{o} C, at 10% O_2

- When laboratory analysis was below the detection limit, the Reportable Detection Limit (RDL) was used to calculate the concentration and emission rate

Average of three tests

Detailed sampling results including individual test results can be found in Appendix B

Table 5: Dioxins and Furans - Averaged Results[1]
Kiln Stack

	Average Concentration [2]	Average Concentration @25°C and 11% O_2 [3]	Average Concentration @ 0°C and 10% O_2 [4]	Reg 419 Toxic Equivalency Factors			
				TEF	TEF Concentration @ 25°C and 11% O_2	TEF Concentration @ 0 °C and 10% O_2	TEF Emission Rate
Parameter	**(pg/m^3)**	**(pg/m^3)**	**(pg/m^3)**		**(pg TEQ/m^3)**	**(pg TEQ/m^3)**	**(pg/s)**
2,3,7,8-Tetra CDD *	< 0.457	< 0.707	< 0.85	1	< 0.707	< 0.85	< 133
1,2,3,7,8-Penta CDD *	< 0.404	< 0.625	< 0.751	1	< 0.625	< 0.751	< 118
1,2,3,4,7,8-Hexa CDD *	< 0.411	< 0.636	< 0.765	0.1	< 0.0636	< 0.0765	< 12
1,2,3,6,7,8-Hexa CDD *	< 0.404	< 0.625	< 0.751	0.1	< 0.0625	< 0.0751	< 11.8
1,2,3,7,8,9-Hexa CDD *	< 0.377	< 0.583	< 0.701	0.1	< 0.0583	< 0.0701	< 11
1,2,3,4,6,7,8-Hepta CDD *	< 1.04	< 1.61	< 1.94	0.01	< 0.0161	< 0.0194	< 3.03
1,2,3,4,6,7,8,9-Octa CDD *	< 6.18	< 9.56	< 11.5	0.0003	< 0.00287	< 0.00345	< 0.541
2,3,7,8-Tetra CDF **	3.09	4.77	5.74	0.1	0.477	0.574	90.1
1,2,3,7,8-Penta CDF **	< 0.858	< 1.33	< 1.59	0.03	< 0.0398	< 0.0478	< 7.51
2,3,4,7,8-Penta CDF **	< 0.66	< 1.02	< 1.23	0.3	< 0.306	< 0.368	< 57.7
1,2,3,4,7,8-Hexa CDF **	< 0.274	< 0.423	< 0.509	0.1	< 0.0423	< 0.0509	< 7.99
1,2,3,6,7,8-Hexa CDF **	< 0.376	< 0.582	< 0.7	0.1	< 0.0582	< 0.07	< 11
2,3,4,6,7,8-Hexa CDF **	< 0.24	< 0.371	< 0.446	0.1	< 0.0371	< 0.0446	< 7
1,2,3,7,8,9-Hexa CDF **	< 0.279	< 0.432	< 0.519	0.1	< 0.0432	< 0.0519	< 8.14
1,2,3,4,6,7,8-Hepta CDF **	< 0.694	< 1.07	< 1.29	0.01	< 0.0107	< 0.0129	< 2.02
1,2,3,4,7,8,9-Hepta CDF **	< 0.49	< 0.758	< 0.911	0.01	< 0.00758	< 0.00911	< 1.43
1,2,3,4,6,7,8,9-Octa CDF **	< 2.12	< 3.28	< 3.95	0.0003	< 0.000985	< 0.00118	< 0.185
Parameter	**(pg/m^3)**	**(pg/m^3)**	**(pg/m^3)**		**(pg TEQ/m^3)**	**(pg TEQ/m^3)**	**(pg/s)**
PCB-081	12.4	19.1	23	0.0003	0.00573	0.00689	1.08
PCB-077	99.1	153	184	0.0001	0.0153	0.0184	2.89
PCB-123	< 7.85	< 12.1	< 14.6	0.00003	< 0.000364	< 0.000438	< 0.0687
PCB-118	317	490	589	0.0003	0.147	0.177	27.7
PCB-114	< 8.46	< 13.1	< 15.7	0.00003	< 0.000393	< 0.000472	< 0.074
PCB-105	126	194	233	0.00003	0.00583	0.007	1.1
PCB-126	< 7.72	< 11.9	< 14.3	0.1	< 1.19	< 1.43	< 225
PCB-167	10.2	15.8	19	0.00003	0.000474	0.00057	0.0892
PCB-156/157	< 23.6	< 36.6	< 43.9	0.00003	< 0.0011	< 0.00132	< 0.206
PCB-169	< 0.882	< 1.36	< 1.64	0.03	< 0.0409	< 0.0492	< 7.72
PCB-189	< 1.35	< 2.08	< 2.5	0.00003	< 0.0000625	< 0.0000751	< 0.0118
				Total Toxic Equivalency	**< 3.97**	**< 4.77**	**< 749**

Notes:

[1] Sampling followed Environment Canada Method RM/2 (Dioxin and Furans)

[2] Referenced concentration values are expressed at 101.3kPa, 25 ^{o} C

[3] Referenced concentration values are expressed at 101.3kPa, 25 ^{o} C, at 11% O_2

[4] Referenced concentration values are expressed at 101.3kPa, 0 ^{o} C, at 10% O_2

Average of three tests

- When laboratory analysis was below the detection limit, the detection limit was used to calculate the concentration and emission rate.

**CCD = Chloro Dibenzo-p-Dioxin,*

***CDF = chlorodibenzo-p-furan*

****CB = chlorobenzene*

Detailed sampling results including individual test results can be found in Appendix C

Table 6 - Polycyclic Aromatic Hydrocarbons (PAH's)
Kiln Stack

Parameter	Concentration [1]	Concentration @ 11% O_2 [2]	Concentration @ 0°C, 10% O_2 [3]	Emission Rate
PAH	**(µg/m³)**	**(µg/m³)**	**(µg/m³)**	**(µg/s)**
Acenaphthene	3.2	4.95	5.95	933
Acenaphthylene	9.84	15.2	18.3	2850
Anthracene	0.548	0.848	1.02	160
Benz(a)anthracene	< 0.00364	< 0.00563	< 0.00677	< 1.06
Benzo(a)fluorene	< 0.00123	< 0.0019	< 0.00229	< 0.359
Benzo(a)pyrene	0.00358	0.00554	0.00666	1.05
Benzo(b)fluoranthene	0.00279	0.00432	0.00519	0.817
Benzo(b)fluorene	< 0.00123	< 0.0019	< 0.00229	< 0.359
Benzo(e)pyrene	0.0109	0.0169	0.0203	3.18
Benzo(g,h,i)perylene	0.0122	0.0189	0.0227	3.55
Benzo(k)fluoranthene	< 0.00204	< 0.00316	< 0.00379	< 0.595
Chloronaphthalene, 2-	0.224	0.347	0.416	65.1
Chrysene	0.0113	0.0175	0.021	3.3
Coronene	0.0107	0.0166	0.0199	3.1
Dibenz(a,h)anthracene	< 0.00123	< 0.0019	< 0.00229	< 0.359
Dimethylanthracene, 9,10-	0.00789	0.0122	0.0147	2.31
Dimethylbenz(a)anthracene, 7,12-	< 0.00123	< 0.0019	< 0.00229	< 0.359
Fluoranthene	0.222	0.343	0.413	64.4
Fluorene	3.97	6.14	7.38	1160
Indeno(1,2,3-c,d)pyrene	< 0.00324	< 0.00501	< 0.00602	< 0.947
Methylanthracene, 2-	2.36	3.65	4.39	693
Methylcholanthrene, 3-	< 0.00123	< 0.0019	< 0.00229	< 0.359
Methylnaphthalene, 1-	73.6	114	137	21500
Methylnaphthalene, 2-	122	189	227	35500
Methylphenanthrene, 1-	4.79	7.41	8.91	1400
Methylphenanthrene, 9-	0.0487	0.0753	0.0905	14.3
Naphthalene	256	396	476	74000
Perylene	0.00346	0.00535	0.00643	1
Phenanthrene	21.5	33.3	40	6290
Picene	< 0.00123	< 0.0019	< 0.00229	< 0.359
Pyrene	0.117	0.181	0.218	33.8
Tetralin	41	63.4	76.2	11900
Triphenylene	0.00721	0.0112	0.0134	2.12

Notes:

[1] Referenced concentration values are expressed at 101.3kPa, 25 ° C

[2] Referenced concentration values are expressed at 101.3kPa, 25 ° C, at 11% O_2

[3] Referenced concentration values are expressed at 101.3kPa, 0 ° C, at 10% O_2

Average of three tests

- When laboratory analysis was below the detection limit, the detection limit was used to calculate the concentration and emission rate.

Detailed sampling results including individual test results can be found in Appendix C

Table 7: Hydrochloric Acid and Ammonia - Averaged Results
Kiln Stack

Parameter	Concentration [1]	Concentration @ 11% O_2 [2]	Concentration @ 0 °C, 10% O_2 [3]	Emission Rate
	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/s)
Ammonia (NH_3)	12.3	19.6	23.6	3510
Hydrochloric Acid	1.62	2.59	3.11	461

Notes:

[1] Referenced concentration values are expressed at 101.3kPa, 25 ^{o} C

[2] Referenced concentration values are expressed at 101.3kPa, 25 ^{o} C, at 11% O_2

[3] Referenced concentration values are expressed at 101.3kPa, 0 ^{o} C, at 10% O_2

Average of three tests

'<' indicates that the laboratory results were less than the Reportable Detection Limit (RDL). The RDL was used to calculate the concentration and emission rate.

Detailed sampling results including individual test results can be found in Appendix D

Table 8: Volatile Organic Compounds - Averaged Results
Kiln Stack

Compound [4],[5]	Concentration[1]	Concentration @ 11% O_2[2]	Concentration @ 0°C, 10% O_2 [3]	Emission Rate
	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/s)
1,1,1-Trichloroethane	< 23.6	< 36.5	< 43.9	< 6.97
1,1-Dichloroethene	< 22.3	< 34.5	< 41.5	< 6.59
1,2-Dibromoethane (EDB)	< 23.3	< 36.1	< 43.4	< 6.89
1,2-Dichloroethane	< 22.3	< 34.5	< 41.5	< 6.59
1,2-Dichloropropane	< 22.3	< 34.5	< 41.5	< 6.59
1,3,5-Trimethylbenzene	< 105	< 163	< 195	< 31.3
2-Butanone (MEK)	< 82.8	< 128	< 154	< 24.3
Acetone	< 170	< 263	< 316	< 50.6
Benzene	780	1210	1450	232
Bromodichloromethane	< 22.3	< 34.5	< 41.5	< 6.59
Bromoform	< 23.6	< 36.5	< 43.9	< 6.97
Bromomethane	< 55.1	< 85.3	< 102	< 16.3
Carbon tetrachloride	< 22.3	< 34.5	< 41.5	< 6.59
Chlorodibromomethane	< 23.6	< 36.5	< 43.9	< 6.97
Chloroform	< 33.3	< 51.5	< 61.9	< 9.84
Dichlorodifluoromethane	< 45.8	< 70.8	< 85.1	< 13.5
Ethylbenzene	< 91.5	< 142	< 170	< 27.2
Isopropylbenzene	< 23.4	< 36.2	< 43.5	< 6.87
m,p-Xylene	< 296	< 458	< 551	< 88.4
Methylene Chloride	< 85.6	< 132	< 159	< 25.1
o-Xylene	< 143	< 221	< 265	< 42.5
Styrene	< 80.3	< 124	< 149	< 23.9
Tetrachloroethene	< 22.3	< 34.5	< 41.5	< 6.59
Toluene	530	820	985	158
trans-1,2-Dichloroethene	< 22.3	< 34.5	< 41.5	< 6.59
Trichloroethene	< 22.3	< 34.5	< 41.5	< 6.59
Trichlorofluoromethane	< 44.8	< 69.3	< 83.3	< 13.2
Vinyl chloride	< 66.2	< 102	< 123	< 19.6

Notes:

[1] Sample volume and volumetric flow rate based on dry referenced conditions (101.3kPa, 25 °C)

[2] All referenced concentration values are expressed at 101.3kPa, 25 °C, and 11% Oxygen

[3] All referenced concentration values are expressed at 101.3kPa, 0 °C, and 10% Oxygen

[4] Butadiene, 1,3 - not reported by analytical laboratory

[5] Trichlorotrifluoroethane - not reported by analytical laboratory

Average of three tests

Detailed sampling results including individual test results can be found in Appendix E

Table 9: Aldehydes - Averaged Results
Kiln Stack

Parameter	Concentration [1]	Concentration @ 11% O_2 [2]	Concentration @ 0°C, 10% O_2 [3]	Emission Rate
	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/s)
Acetaldehyde	1.85	2.86	3.44	546
Acrolein	0.196	0.303	0.364	57.8
Propionaldehyde	0.298	0.461	0.554	87.9

Notes:

[1] Referenced concentration values are expressed at 101.3kPa, 25° C

[2] Referenced concentration values are expressed at 101.3kPa, 25° C, at 11% O_2

[3] Referenced concentration values are expressed at 101.3kPa, 0° C, at 10% O_2

Average of three tests

When laboratory analysis was below the detection limit, the Reportable Detection Limit (RDL) was used to calculate the concentration and emission rate

Flow rate from isokinetic tests were used to calculate the emission rate

Detailed sampling results including individual test results can be found in Appendix F

Table 10: Phenol and Methanol - Averaged Results
Kiln Stack

Parameter	Concentration [1]	Concentration @ 11% O_2 [2]	Concentration @ 0 °C, 10% O_2 [3]	Emission Rate
	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/s)
Methanol	< 8.47	< 13.1	< 15.7	< 2500
Phenol	< 8.47	< 13.1	< 15.7	< 2500

Notes:

[1] Referenced concentration values are expressed at 101.3kPa, 25° C

[2] Referenced concentration values are expressed at 101.3kPa, 25° C, at 11% O_2

[3] Referenced concentration values are expressed at 101.3kPa, 0° C, at 10% O_2

Average of three tests

When laboratory analysis was below the detection limit, the Reportable Detection Limit (RDL) was used to calculate the concentration and emission rate

Flow rate from isokinetic tests were used to calculate the emission rate

Detailed sampling results including individual test results can be found in Appendix G

Table 11: CEMS - Averaged Results

Kiln Stack

	Average				
	O2 (%)	**CO2 (%)**	**CO (ppm)**	**CO (mg/m^3) [1]**	**CO (g/s) [2]**
	15.0	10.1	161	184	54.4

Test ID: 1	**August 13, 2025**			
Time	**O2 (%)**	**CO2 (%)**	**CO (ppm)**	**CO (mg/m^3) [1]**
1:30 PM to 2:29 PM	14.9	9.9	154	176

Test ID: 2	**August 13, 2025**			
Time	**O2 (%)**	**CO2 (%)**	**CO (ppm)**	**CO (mg/m^3) [1]**
2:56 PM to 3:56 PM	14.9	10.4	161	185

Test ID: 3	**21-Aug-25**			
Time	**O2 (%)**	**CO2 (%)**	**CO (ppm)**	**CO (mg/m^3) [1]**
4:16 PM to 5:15 PM	15.1	10	168	192

Notes:

[1] Referenced flow rate expressed as dry at 101.3 kPa, 25°C, and Actual Oxygen

[2] Emission rate calculated based on averaged volumetric flow rate of isokinetic tests

Detailed CEM results can be found in Appendix H

Table 12: Results Comparison
Kiln Stack

Parameter	Stack Testing Results [1]	ECA Limit [2]
Limits in Schedule B of the C of A (0550-CEAHMA)		
Particulate Matter	8.37 mg/Rm^3	50 mg/Rm^3
Cadmium	< 0.0481 $\mu g/Rm^3$	7 $\mu g/Rm^3$
Lead	< 0.718 $\mu g/Rm^3$	60 $\mu g/Rm^3$
Mercury	< 1.07 $\mu g/Rm^3$	20 $\mu g/Rm^3$
Dioxins and Furans	< 3.97 pg/Rm^3	80 pg/Rm^3 ITEQ
Hydrochloric Acid	2.59 mg/Rm^3	27 mg/Rm^3

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

Table 13: Summary of Operating Conditions
Kiln Stack

Source and Test #	Sampling Date	Start Time	End Time	Alt Fuel Rate to Kiln (tonnes/hr)	Clinker Production (tonnes/hr)	Carbon Monoxide at Calciner Down Comer (ppm)	Carbon Monoxide at back of Kiln (ppm)	CEM NO_x (ppmv)	CEM O_2 (% vol)	Oxygen at Calciner Down Comer (%)	Oxygen at back of Kiln (%)	Temperature of gas leaving Kiln (°C)	Temperature of gas leaving Calciner (°C)	Conv Fuel Kiln Firing Rt (t)	Conv Fuel Rate Total (t)	Conv Fuel To Calciner Firing Rate (t)	Dust @ 11% O2 (mg/Nm³)	Fuel Adjunct Materials (t)	THC (ppmv)
M29/SVOC Test #1	13-Aug-25	7:57 AM	12:43 PM	11.1	227	322	0.00	141.5	13.7	8.48	5.61	825	893	8.38	21.9	13.5	4.18	1.79	141
M29/SVOC Test #2	20-Aug-25	10:03 AM	2:55 PM	13.0	217	174	0.00	140.4	13.6	9.07	6.31	827	894	7.79	17.1	9.27	3.89	2.61	162
M29 Test #3	21-Aug-25	8:53 AM	5:56 PM	10.9	219	206	0.00	129.8	13.5	8.17	9.44	817	893	8.21	22.5	14.3	3.79	2.61	159
SVOC Test #3	22-Aug-25	10:27 AM	2:44 PM	12.3	216	384	0.00	124.1	13.6	5.46	18.86	824	892	7.84	20.3	12.5	3.84	2.61	156
HCl/Ammonia T1	12-Aug-25	12:01 PM	2:28 PM	12.9	227	127	0.00	157.4	14.0	8.49	5.91	822	893	8.19	18.5	10.3	4.67	2.51	132
HCl/Ammonia T2	12-Aug-25	4:06 PM	6:30 PM	10.8	227	145	0.00	154.7	14.2	8.80	6.45	817	894	7.73	19.1	11.4	4.61	2.90	143
HCl/Ammonia T3	21-Aug-25	3:53 PM	6:16 PM	11.9	219	299	0.00	129.0	13.5	5.18	5.11	815	892	7.97	22.4	14.4	3.80	2.62	159
Alcohols T1	12-Aug-25	4:55 PM	5:55 PM	11.7	227	139	0.00	154.3	14.2	8.74	6.25	819	895	7.77	18.6	10.9	4.61	3.11	145
Alcohols T2	13-Aug-25	10:02 AM	11:02 AM	13.1	227	299	0.00	140.6	13.6	8.28	5.39	825	893	8.38	21.8	13.4	4.00	2.44	160
Alcohols T3	13-Aug-25	11:26 AM	12:26 PM	9.18	227	536	0.00	132.5	13.2	7.48	5.03	829	893	8.29	23.8	15.5	3.95	1.12	136
Aldehydes T1	20-Aug-25	10:47 AM	11:47 AM	13.0	217	239	0.00	141.6	13.7	9.10	6.39	828	893	7.88	16.2	8.30	3.95	2.61	167
Aldehydes T2	20-Aug-25	1:11 PM	2:11 PM	13.0	217	108	0.00	139.2	13.6	9.03	6.24	825	894	7.70	17.9	10.2	3.84	2.61	157
Aldehydes T3	20-Aug-25	3:15 PM	4:15 PM	13.0	217	55.0	0.00	136.7	13.5	9.36	6.81	826	894	7.55	18.6	11.1	3.77	2.61	155
VOST T1	20-Aug-25	10:17 AM	11:17 AM	13.0	217	239	0.00	141.6	13.7	9.10	6.39	828	893	7.88	16.2	8.30	3.95	2.61	167
VOST T2	20-Aug-25	1:10 PM	2:10 PM	13.0	217	108	0.00	139.2	13.6	9.03	6.24	825	894	7.70	17.9	10.2	3.84	2.61	157
VOST T3	20-Aug-25	3:15 PM	4:17 PM	13.0	217	55.0	0.00	136.7	13.5	9.36	6.81	826	894	7.55	18.6	11.1	3.77	2.61	155

Carbon Dioxide Intensity Testing Data Summary

Carbon Dioxide Emission Intensity Summary (O.Reg. 79/15) - 2025
St. Marys Cement Inc. (Canada) - Bowmanville Facility

CO_2 Intensity (kg CO_2/MJ) = Non-biological Carbon Content (%) × 3.67 kg CO_2/kg C ÷ Higher Heating Value (MJ/kg fuel)

Where:
- Non-biological Carbon Content = Total Carbon Content (%) * [100% - Biogenic Carbon Content (%)]
- Total Carbon Content = Result from fuel sample analysis
- Biogenic Carbon Content = Result from plastics carbon testing
- Higher Heating Value = Value from fuel sample analysis

Sample Calculation for EFS Plastics:
CO_2 Intensity (kg CO_2/MJ) = Non-biological Carbon Content (%) × 3.67 kg CO_2/kg C ÷ Higher Heating Value (MJ/kg fuel)
CO_2 Intensity (kg CO_2/MJ) = Total Carbon Content (%) × [100% - Biogenic Carbon Content (%)] × 3.67 kg CO_2/kg C ÷ Higher Heating Value (MJ/kg fuel)
CO_2 Intensity (kg CO2/MJ) = 50% × (100%-3%) × 3.67 kg CO2/kg C ÷ 21.84 (MJ/kg fuel)
CO_2 Intensity (kg CO2/MJ) = 0.0814

Carbon dioxide intentsity values for all fuels used in 2025 are included in Table 1 below.

Table 1. CO_2 Emission Intensity Summary

Parameter	Coal	Shot Pet Coke	Fluid Pet Coke	Shot/Fluid Pet Coke	Wood	Plastics			
						EFS	ReWorld	Evolve	CRM Nylon
Sample No.	N/A	N/A	N/A	N/A	N/A	LR008809	LR008692	LR008810	N/A
Biogenic Carbon Content	0%	0%	0%	0%	100%	7%	47%	29%	29%
Total Carbon Content	69%	82%	83%	82%	42%	69%	37%	71%	71%
Fuel HHV (MJ/kg)	28.57	32.72	31.77	32.24	17.32	33.05	14.98	31.11	31.11
CO_2 Intensity (kg CO_2/MJ)	0.0889	0.0917	0.0958	0.0937	0	0.0706	0.0474	0.0594	0.0594

As shown in Table 1 above, the carbon dioxide intensity values are lower for the Alternative Low Carbon Fuels than the conventional fuels.

Petro Laboratories Inc.

1295 Matheson Blvd. East, Mississauga, Ontario, L4W 1R1 Tel: (905) 361-2388 , Email : petrolab@gmail.com

Laboratory Report

St. Marys Cement
400 Waverly Road South,
Bowmanville, Ontario
L1C 3K3

Lab no.: 9578 - 1 to 4
Date Report: Oct 20 , 2025
Sample in: Oct 15, 2025
PO no.: 6300601922

Attention: Jason Schultz , Mike Pryde

Re: Wood Chip, Nylon , Plastic & Coal / coke sample from Oct 25,2025 for analysis.

Lab no.			9578-1	9578-2	9578-3	9578-4
Sample ID.			**Biomass**	**Nylon**	**Plastic**	**Conventional Fuels**
Tests	**Method ASTM**	**Unit**	**Results**			
2. Moisture content, As Received	E870	% wt.	11.03	1.34	5.98	5.63
5. Total Carbon, As Received	D5373	% wt.	44.49	69.60	50.33	64.38
6. Total Organic Carbon	D4129	% wt.	43.12	68.51	45.25	63.52

Tested by : QN.(Chemist)
Member of ASTM
JS:LN

Approved by James Szeto
James Szeto,B.Sc.
Chief Chemist

Carbon Dioxide Emission Intenstity

				Tests			
Lab no.			Sample Type	1. Moisture, % wt.	2. Total Carbon, % wt.	3. Total Organic Carbon, % wt.	CO_2 Intensity
9578-	Sample ID.	**Date**	ASTM method	**E870**	**D5373**	**D4129**	
1	Conventional #1	10/25/2025	Coal/Petcoke	5.63	64.38	63.52	10.1667
2	ALCF-Biomass #1	10/25/2025	Wood	11.03	44.49	43.12	0.0681
3	ALCF-Nylon #1	10/25/2025	Nylon	1.34	69.60	68.51	4.5980
4	ALCF -Plastic #1	10/25/2025	Plastic	5.98	50.33	45.25	6.6456
-	Combined ALCF	10/25/2025	ALCF	-	-	-	1.1788

Conventional Fuel mix - 50% Coal, 25% Pet Coke, 25% Fluid Coke
ALCF Ratio - 80% Wood, 20% Plastics

Beta Analytic, Inc.
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Tel: (305) 667-5167
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ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
DD204ED46D363B7CE7DC4F8EC362BC8C

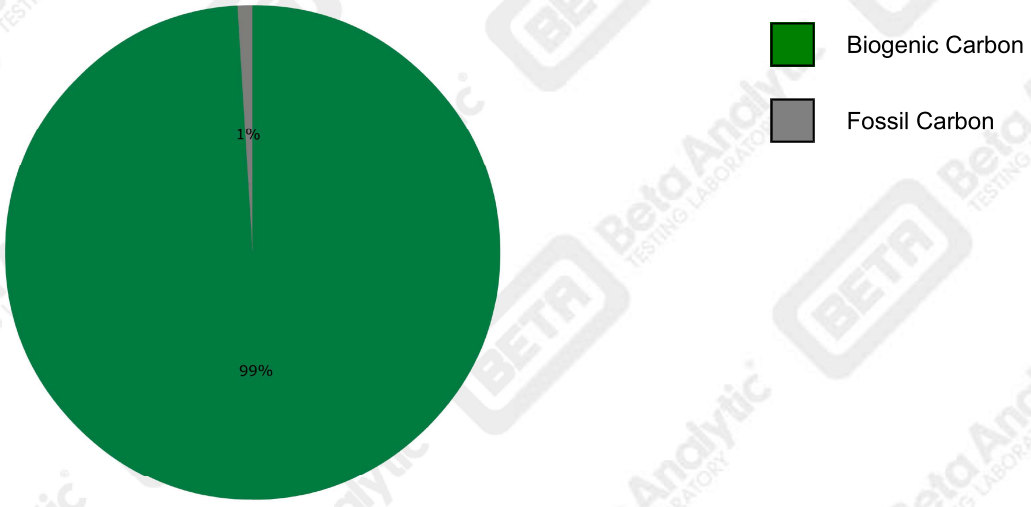
To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	905 Wood - WD - 0125

Result

99% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729868
Percent modern carbon (pMC)	111.22 +/- 0.24 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/[1/(99.4/112)]



Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO2 in the air and/or from fossil carbon (more than 45,000 years old) such as petroleum or coal. The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

The analytical procedures for measuring radiocarbon content using the different standards are identical. The only difference is the reporting format. Results are usually reported using the standardized terminology “% biobased carbon”. Only ASTM D6866 uses the term “% biogenic carbon” when the result represents all carbon present (Total Carbon) rather than just the organic carbon (Total Organic Carbon). The terms “% biobased carbon” and “% biogenic carbon” are now the standard units in regulatory and industrial applications, replacing obscure units of measure historically reported by radiocarbon dating laboratories e.g. disintegra tions per minute per gram (dpm/g) or radiocarbon age.

The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

Interpretation and application of the results is straightforward. A value of 100% biobased or biogenic carbon would indicate that 100% of the carbon came from plants or animal by-products (biomass) living in the natural environment and a value of 0% would mean that all of the carbon was derived from petrochemicals, coal and other fossil sources. A value between 0-100% would indicate a mixture. The higher the value, the greater the proportion of naturally sourced components in the material.

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ISO/IEC 17025:2017-Accredited Testing Laboratory

Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990C and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

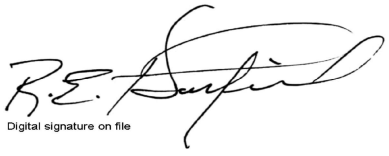
Report Date January 21, 2025

Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	129.41 +/- 0.06 pMC
Measured Value	129.39 +/- 0.32 pMC
Agreement	Accepted
Reference 2	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 3	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	96.21 +/- 0.24 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation 

Date January 21, 2025

Beta Analytic, Inc.
4985 SW 74th Court
Miami, FL 33155 USA
Tel: (305) 667-5167
info@betalabservices.com

ISO/IEC 17025:2017-Accredited Testing Laboratory

January 21, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
Bowmanville, Ontario (ON) L1C 7B5
Canada

Dear Mike Pryde,

Please find enclosed your radiocarbon (C14) report for the material recently submitted. The result is reported as "% Biogenic Carbon". This indicates the percentage carbon from "renewable" (biomass or animal by-product) sources versus petroleum (or otherwise fossil) sources . For reference, 100 % Biogenic Carbon indicates that a material is entirely sourced from plants or animal by-products and 0 % Biogenic Carbon indicates that a material did not contain any carbon from plants or animal by-products. A value in between represents a mixture of natural and fossil sources.

The analytical measurement is cited as "percent modern carbon (pMC)". This is the percentage of C14 measured in the sample relative to a modern reference standard (NIST 4990C). The % Biogenic Carbon content is calculated from pMC by applying a small adjustment factor for C14 in carbon dioxide in air today. It is important to note is that all internationally recognized standards using C14 assume that the plant or biomass feedstocks were obtained from natural environments.

Reported results are accredited to ISO/IEC 17025:2017 PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators in Miami, Florida.

The international standard method utilized for this analysis is cited under Summary of Results. The standard version used is the latest available as of the date reported (unless otherwise noted). The report also indicates if the result is relative to total carbon (TC) or only total organic carbon (TOC). When interpreting the results, please consider any communications you may have had with us regarding the analysis. If you have any questions, please contact us. We welcome your inquiries.

Sincerely,

Liliana Durham
Laboratory Management Group / AMS Instrumentation Manager

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ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
EACF6781C850C902A804FF9F532B6418

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	Woodbridge - WD - 0125

Result

100% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729867
Percent modern carbon (pMC)	116.92 +/- 0.23 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/[1/(99.4/112)]



Labeling COC


VOC (1mm x 1mm scale)


3103.6mg analyzed (1mm x 1mm scale)

Disclosures: All analytical work is performed by BETA Analytic's professional staff, in its laboratories on our AMS, IRMS, CRDS and GC instruments. No subcontractors are ever used. We are a tracer-free 14C facility that does not accept or analyze materials that might contain artificial 14C (from biomedical, environmental, or other studies). Quality Assurance is maintained through our ongoing ISO/IEC 17025:2017 Laboratory Testing Accreditation, and verified by Quality Assurance Reports, posted to the web-library along with this report.

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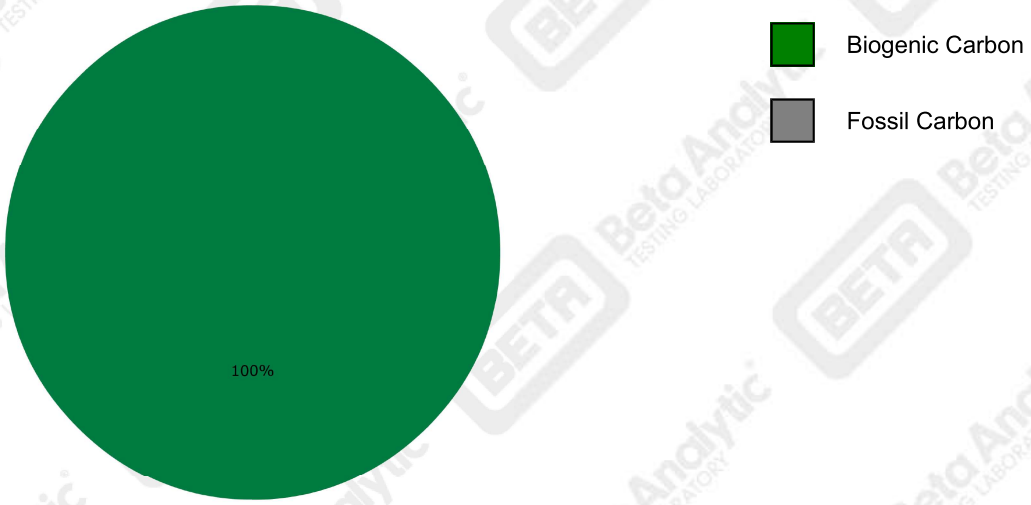

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

The analytical procedures for measuring radiocarbon content using the different standards are identical. The only difference is the reporting format. Results are usually reported using the standardized terminology “% biobased carbon”. Only ASTM D6866 uses the term “% biogenic carbon” when the result represents all carbon present (Total Carbon) rather than just the organic carbon (Total Organic Carbon). The terms “% biobased carbon” and “% biogenic carbon” are now the standard units in regulatory and industrial applications, replacing obscure units of measure historically reported by radiocarbon dating laboratories e.g. disintegra tions per minute per gram (dpm/g) or radiocarbon age.

The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

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Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990C and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

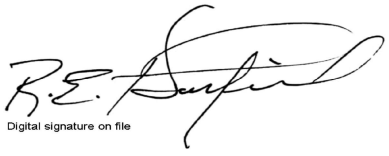
Report Date January 21, 2025

Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	129.41 +/- 0.06 pMC
Measured Value	129.39 +/- 0.32 pMC
Agreement	Accepted
Reference 2	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 3	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	96.21 +/- 0.24 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation 

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Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
E578C637FA9F0C03C524B5B13F02FD2A

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	Re-World - PL - 0125

Result

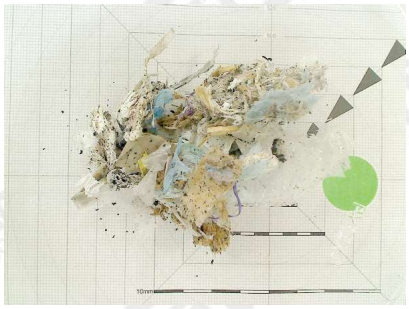
47% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729865
Percent modern carbon (pMC)	46.98 +/- 0.15 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/0.994



Labeling COC


VOC (1mm x 1mm scale)


3173.7mg analyzed (1mm x 1mm scale)

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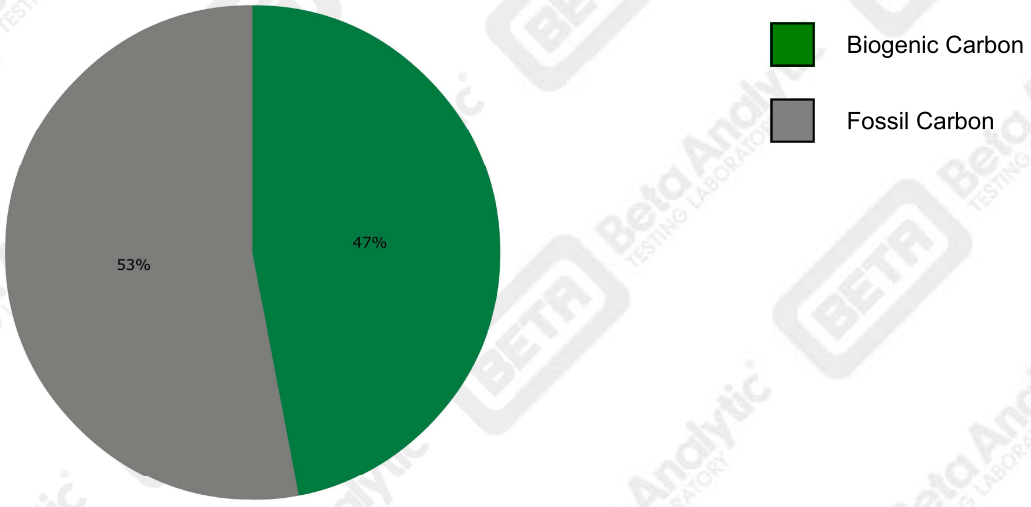

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

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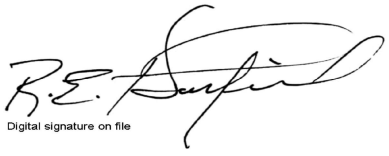
Comment All measurements passed acceptance tests.

Validation 

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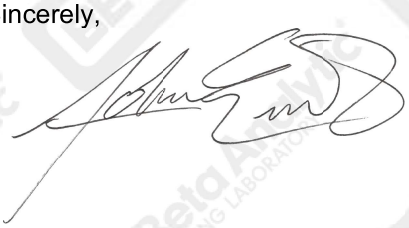

John Enriquez
Laboratory Management Group / AMS Chemistry Manager

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Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
3C52A78374405FDDE8BA0D9A92ACCF64

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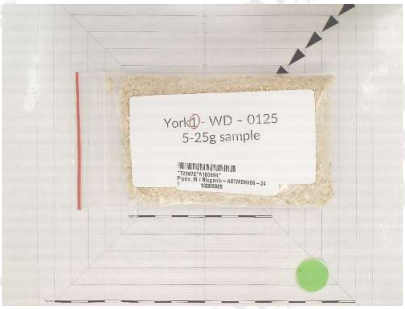
Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	York1 - WD - 0125

Result

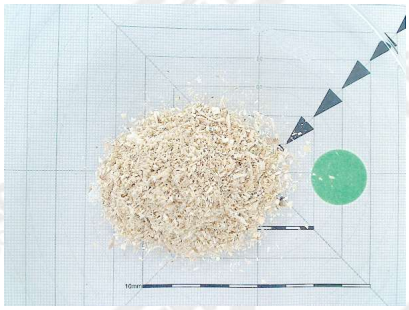
100% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729870
Percent modern carbon (pMC)	112.51 +/- 0.21 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/[1/(99.4/112)]



Labeling COC


VOC (1mm x 1mm scale)


3116.0mg analyzed (1mm x 1mm scale)

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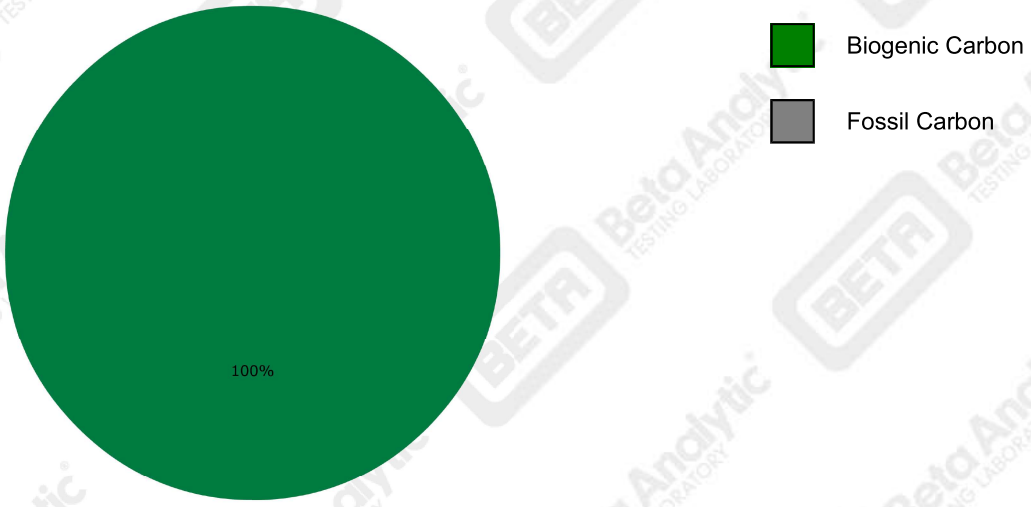

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The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

Interpretation and application of the results is straightforward. A value of 100% biobased or biogenic carbon would indicate that 100% of the carbon came from plants or animal by-products (biomass) living in the natural environment and a value of 0% would mean that all of the carbon was derived from petrochemicals, coal and other fossil sources. A value between 0-100% would indicate a mixture. The higher the value, the greater the proportion of naturally sourced components in the material.

Beta Analytic, Inc.
4985 SW 74th Court
Miami, FL 33155 USA
Tel: (305) 667-5167
info@betalabservices.com

ISO/IEC 17025:2017-Accredited Testing Laboratory

Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990C and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

Report Date January 21, 2025

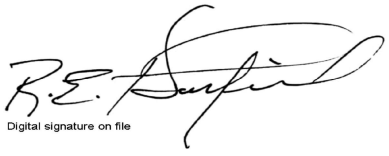
Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	129.41 +/- 0.06 pMC
Measured Value	129.39 +/- 0.16 pMC
Agreement	Accepted
Reference 2	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 3	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	96.21 +/- 0.24 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation



Date January 21, 2025

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January 21, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
Bowmanville, Ontario (ON) L1C 7B5
Canada

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Reported results are accredited to ISO/IEC 17025:2017 PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators in Miami, Florida.

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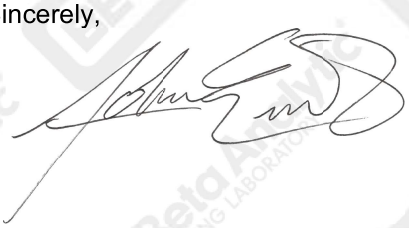
Sincerely,



John Enriquez
Laboratory Management Group / AMS Chemistry Manager

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ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
EF041C58754568D84B5EE6AFF8A09AEC

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	GFL - WD - 0125

Result

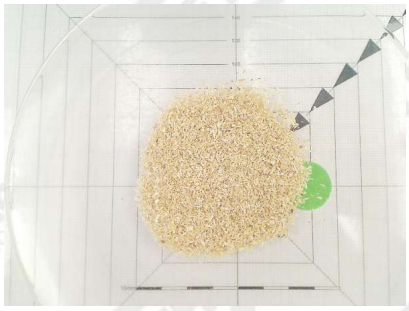
98% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729869
Percent modern carbon (pMC)	110.80 +/- 0.21 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/[1/(99.4/112)]



Labeling COC


VOC (1mm x 1mm scale)


3136.5mg analyzed (1mm x 1mm scale)

Disclosures: All analytical work is performed by BETA Analytic's professional staff, in its laboratories on our AMS, IRMS, CRDS and GC instruments. No subcontractors are ever used. We are a tracer-free 14C facility that does not accept or analyze materials that might contain artificial 14C (from biomedical, environmental, or other studies). Quality Assurance is maintained through our ongoing ISO/IEC 17025:2017 Laboratory Testing Accreditation, and verified by Quality Assurance Reports, posted to the web-library along with this report.

The published report is final and non-modifiable.

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Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

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Received Date	January 13, 2025
Report Date	January 21, 2025
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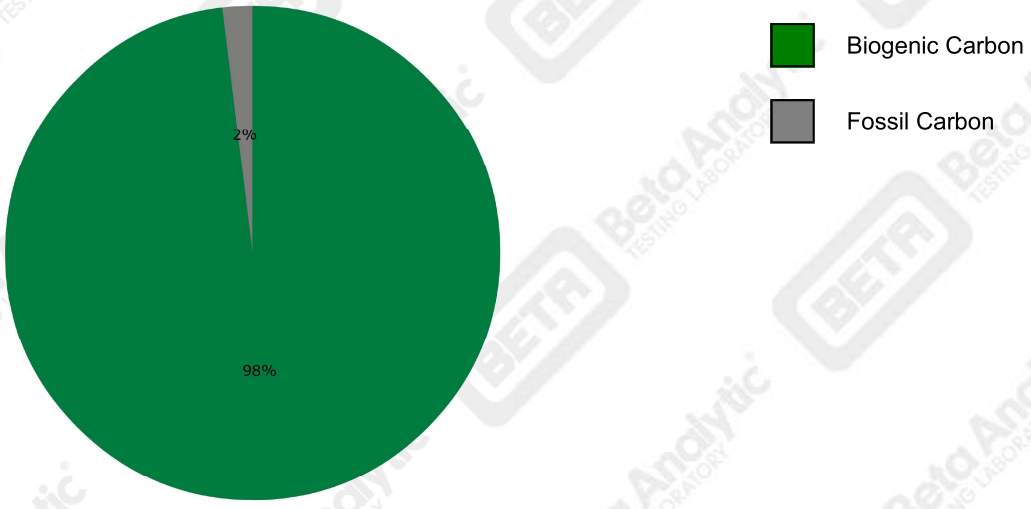

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

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Quality Assurance Report

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Report Date January 21, 2025

Submitter Mike Pryde

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Expected Value	129.41 +/- 0.06 pMC
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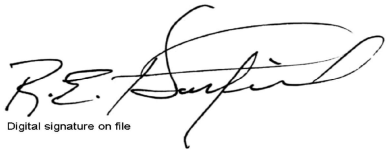
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 3	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	96.21 +/- 0.24 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation



Date January 21, 2025

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January 21, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
Bowmanville, Ontario (ON) L1C 7B5
Canada

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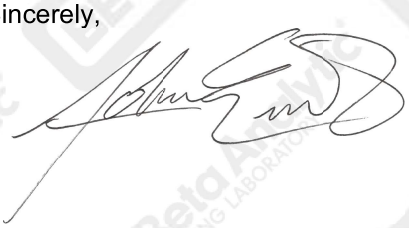

John Enriquez
Laboratory Management Group / AMS Chemistry Manager

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Tel: (305) 667-5167
info@betalabservices.com

ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
1F8BD7326B36C31D69C079E782B90F8D

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	Sol - WD - 0125

Result

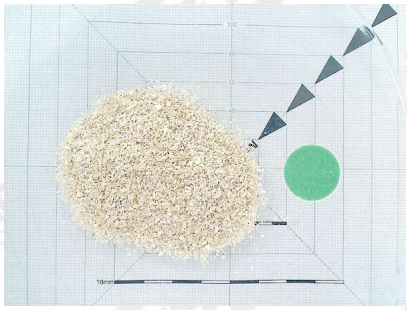
100% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729866
Percent modern carbon (pMC)	114.98 +/- 0.20 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/[1/(99.4/112)]



Labeling COC


VOC (1mm x 1mm scale)


3449.3mg analyzed (1mm x 1mm scale)

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Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

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Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	Sol - WD - 0125

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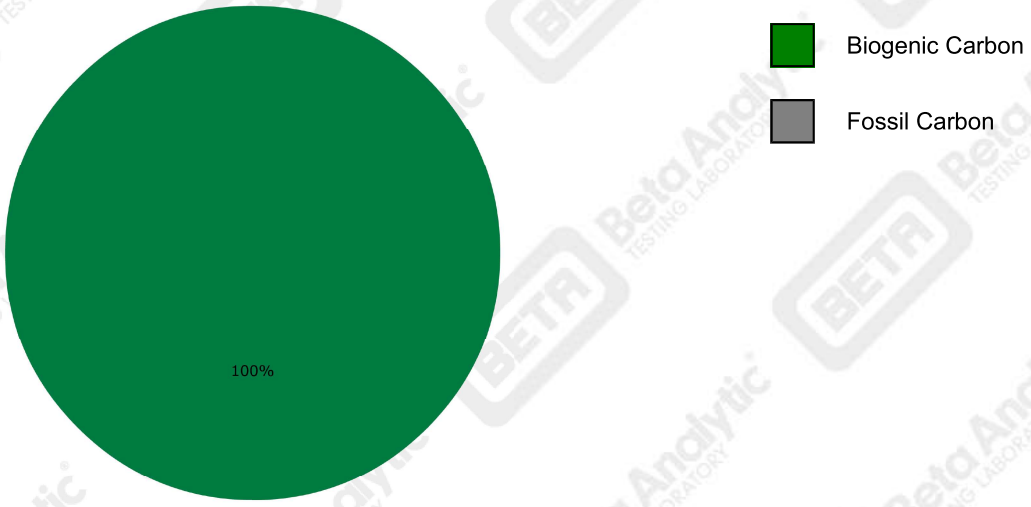

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

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Quality Assurance Report

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Report Date January 21, 2025

Submitter Mike Pryde

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Expected Value	95.86 +/- 0.37 pMC
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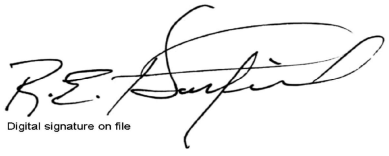
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation



Date January 21, 2025

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January 21, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
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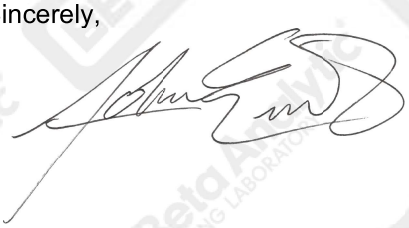

John Enriquez
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ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
AF915DC0127AF3CC22B5E6EC8F238A59

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	EFS - PL - 0125

Result

7% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729864
Percent modern carbon (pMC)	6.70 +/- 0.06 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/0.994



Labeling COC


VOC (1mm x 1mm scale)


3193.9mg analyzed (1mm x 1mm scale)

Disclosures: All analytical work is performed by BETA Analytic's professional staff, in its laboratories on our AMS, IRMS, CRDS and GC instruments. No subcontractors are ever used. We are a tracer-free 14C facility that does not accept or analyze materials that might contain artificial 14C (from biomedical, environmental, or other studies). Quality Assurance is maintained through our ongoing ISO/IEC 17025:2017 Laboratory Testing Accreditation, and verified by Quality Assurance Reports, posted to the web-library along with this report.

The published report is final and non-modifiable.

This report has been built with the information provided on the online form by the client. If different reporting information is required, a new sample analysis must be performed, with a new online form filled out to include exactly the information requested on the form.

Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO2 in the air and/or from fossil carbon (more than 45,000 years old) such as petroleum or coal. The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.

Beta Analytic, Inc.
4985 SW 74th Court
Miami, FL 33155 USA
Tel: (305) 667-5167
info@betalabservices.com

ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
AF915DC0127AF3CC22B5E6EC8F238A59

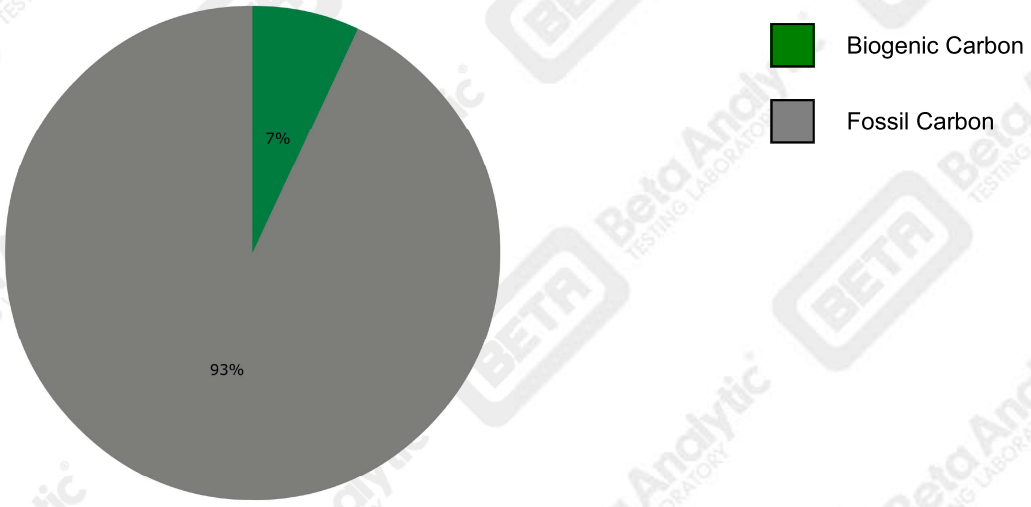
To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	EFS - PL - 0125

Result

7% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729864
Percent modern carbon (pMC)	6.70 +/- 0.06 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/0.994



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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

The analytical procedures for measuring radiocarbon content using the different standards are identical. The only difference is the reporting format. Results are usually reported using the standardized terminology “% biobased carbon”. Only ASTM D6866 uses the term “% biogenic carbon” when the result represents all carbon present (Total Carbon) rather than just the organic carbon (Total Organic Carbon). The terms “% biobased carbon” and “% biogenic carbon” are now the standard units in regulatory and industrial applications, replacing obscure units of measure historically reported by radiocarbon dating laboratories e.g. disintegra tions per minute per gram (dpm/g) or radiocarbon age.

The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

Interpretation and application of the results is straightforward. A value of 100% biobased or biogenic carbon would indicate that 100% of the carbon came from plants or animal by-products (biomass) living in the natural environment and a value of 0% would mean that all of the carbon was derived from petrochemicals, coal and other fossil sources. A value between 0-100% would indicate a mixture. The higher the value, the greater the proportion of naturally sourced components in the material.

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ISO/IEC 17025:2017-Accredited Testing Laboratory

Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990C and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

Report Date January 21, 2025

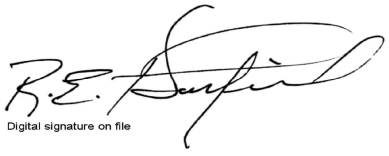
Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	129.41 +/- 0.06 pMC
Measured Value	129.39 +/- 0.16 pMC
Agreement	Accepted
Reference 2	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 3	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	96.21 +/- 0.24 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation



Date January 21, 2025

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ISO/IEC 17025:2017-Accredited Testing Laboratory

January 21, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
Bowmanville, Ontario (ON) L1C 7B5
Canada

Dear Mike Pryde,

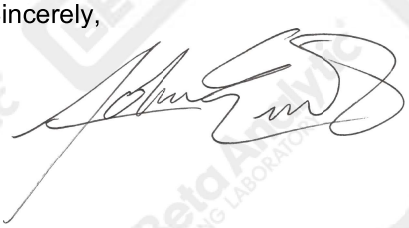
Please find enclosed your radiocarbon (C14) report for the material recently submitted. The result is reported as “% Biogenic Carbon”. This indicates the percentage carbon from “renewable” (biomass or animal by-product) sources versus petroleum (or otherwise fossil) sources . For reference, 100 % Biogenic Carbon indicates that a material is entirely sourced from plants or animal by-products and 0 % Biogenic Carbon indicates that a material did not contain any carbon from plants or animal by-products. A value in between represents a mixture of natural and fossil sources.

The analytical measurement is cited as “percent modern carbon (pMC)”. This is the percentage of C14 measured in the sample relative to a modern reference standard (NIST 4990C). The % Biogenic Carbon content is calculated from pMC by applying a small adjustment factor for C14 in carbon dioxide in air today. It is important to note is that all internationally recognized standards using C14 assume that the plant or biomass feedstocks were obtained from natural environments.

Reported results are accredited to ISO/IEC 17025:2017 PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators in Miami, Florida.

The international standard method utilized for this analysis is cited under Summary of Results. The standard version used is the latest available as of the date reported (unless otherwise noted). The report also indicates if the result is relative to total carbon (TC) or only total organic carbon (TOC). When interpreting the results, please consider any communications you may have had with us regarding the analysis. If you have any questions, please contact us. We welcome your inquiries.

Sincerely,



John Enriquez
Laboratory Management Group / AMS Chemistry Manager

Beta Analytic, Inc.
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info@betalabservices.com

ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
F6BBA1B7F21C8B0CA84CAB22C5D9C3BC

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	Evolve - NY-0125

Result

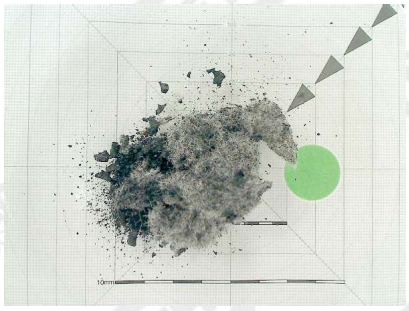
29% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-729863
Percent modern carbon (pMC)	28.34 +/- 0.10 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/0.994



Labeling COC


VOC (1mm x 1mm scale)


2531.1mg analyzed (1mm x 1mm scale)

Disclosures: All analytical work is performed by BETA Analytic's professional staff, in its laboratories on our AMS, IRMS, CRDS and GC instruments. No subcontractors are ever used. We are a tracer-free 14C facility that does not accept or analyze materials that might contain artificial 14C (from biomedical, environmental, or other studies). Quality Assurance is maintained through our ongoing ISO/IEC 17025:2017 Laboratory Testing Accreditation, and verified by Quality Assurance Reports, posted to the web-library along with this report.

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ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
F6BBA1B7F21C8B0CA84CAB22C5D9C3BC

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	January 13, 2025
Report Date	January 21, 2025
Sample Code	Evolve - NY-0125

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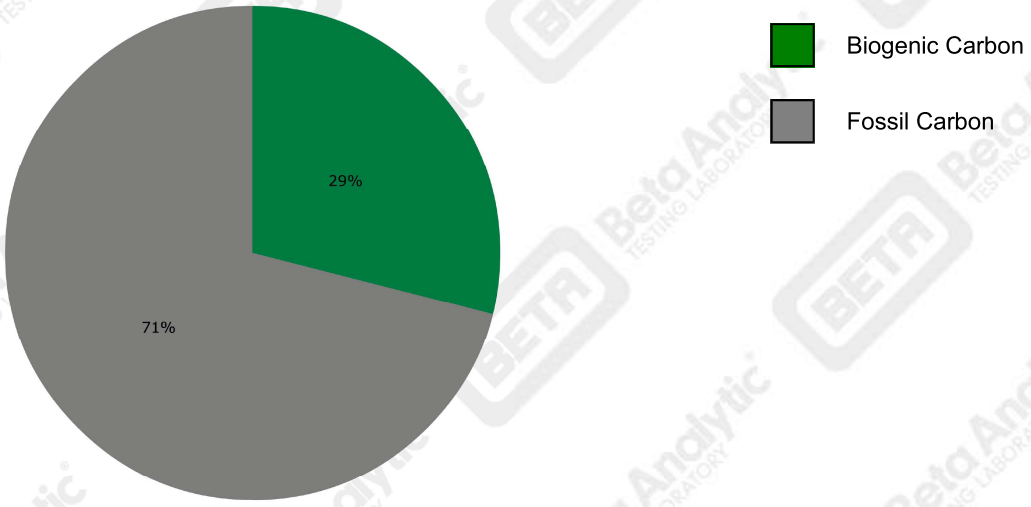

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

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ISO/IEC 17025:2017-Accredited Testing Laboratory

Quality Assurance Report

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Report Date January 21, 2025

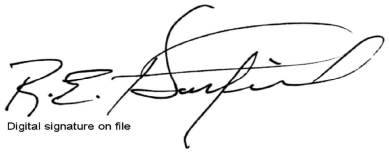
Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	129.41 +/- 0.06 pMC
Measured Value	129.39 +/- 0.16 pMC
Agreement	Accepted
Reference 2	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 3	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	96.21 +/- 0.24 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation



Date January 21, 2025

ISO/IEC 17025:2017-Accredited Testing Laboratory

Beta Analytic, LLC
4985 SW 74th Court
Miami, FL 33155 USA
Tel: (305) 667-5167
info@betalabservices.com

July 16, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
Bowmanville, Ontario (ON) L1C 7B5
Canada

Dear Mike Pryde,

Please find enclosed your radiocarbon (C14) report for the material recently submitted. The result is reported as “% Biogenic Carbon”. This indicates the percentage carbon from “renewable” (biomass or animal by-product) sources versus petroleum (or otherwise fossil) sources . For reference, 100 % Biogenic Carbon indicates that a material is entirely sourced from plants or animal by-products and 0 % Biogenic Carbon indicates that a material did not contain any carbon from plants or animal by-products. A value in between represents a mixture of natural and fossil sources.

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Reported results are accredited to ISO/IEC 17025:2017 PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators in Miami, Florida.

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Sincerely,



Carlos Barroso
Laboratory Management Group / AMS Pretreatment Manager

ISO/IEC 17025:2017-Accredited Testing Laboratory

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4985 SW 74th Court
Miami, FL 33155 USA
Tel: (305) 667-5167
info@betalabservices.com

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
3C6F64E080F031D6BDBD2BB4CA4C5ACD

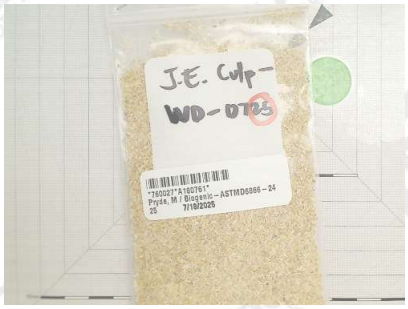
To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	July 9, 2025
Report Date	July 16, 2025
Sample Code	Je Culp - WD - 0725

Result

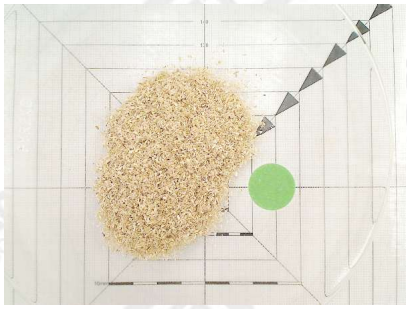
100% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-760027
Percent modern carbon (pMC)	105.05 +/- 0.20 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/0.994



Labeling COC


VOC (1mm x 1mm scale)


3393.8mg analyzed (1mm x 1mm scale)

Disclosures: All analytical work is performed by BETA Analytic's professional staff, in its laboratories on our AMS, IRMS, CRDS and GC instruments. No subcontractors are ever used. We are a tracer-free 14C facility that does not accept or analyze materials that might contain artificial 14C (from biomedical, environmental, or other studies). Quality Assurance is maintained through our ongoing ISO/IEC 17025:2017 Laboratory Testing Accreditation, and verified by Quality Assurance Reports, posted to the web-library along with this report.

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ISO/IEC 17025:2017-Accredited Testing Laboratory

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Miami, FL 33155 USA
Tel: (305) 667-5167
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Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
3C6F64E080F031D6BDBD2BB4CA4C5ACD

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Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	July 9, 2025
Report Date	July 16, 2025
Sample Code	Je Culp - WD - 0725

Result

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Laboratory Number	Beta-760027
Percent modern carbon (pMC)	105.05 +/- 0.20 pMC
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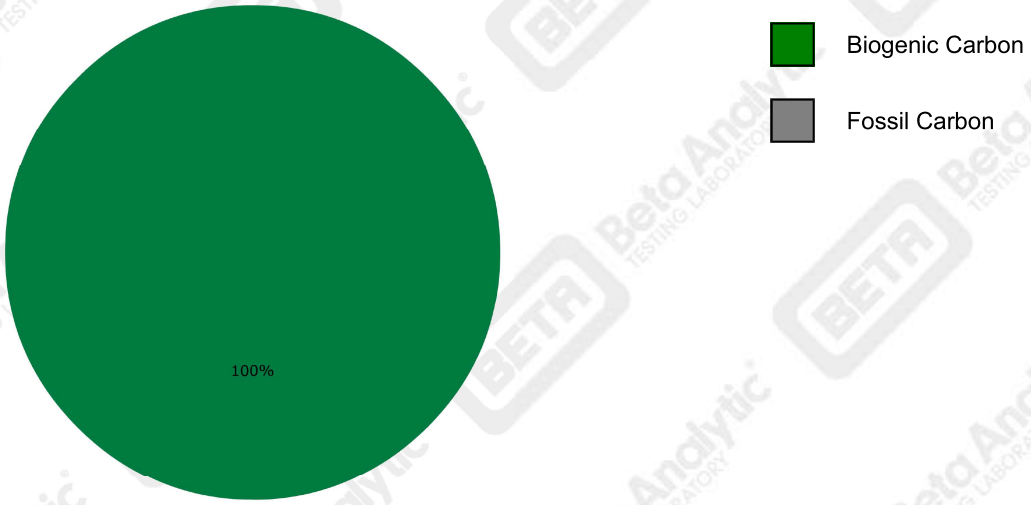

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

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ISO/IEC 17025:2017-Accredited Testing Laboratory

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Quality Assurance Report

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Report Date July 16, 2025

Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 2	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	95.98 +/- 0.24 pMC
Agreement	Accepted
Reference 3	
Expected Value	110.69 +/- 0.40 pMC
Measured Value	110.75 +/- 0.28 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation 

Date July 16, 2025

ISO/IEC 17025:2017-Accredited Testing Laboratory

Beta Analytic, LLC
4985 SW 74th Court
Miami, FL 33155 USA
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July 16, 2025

Mike Pryde
St. Marys Cement (Canada) - Ontario - Bowmanville Plant
410 Bowmanville Avenue
Bowmanville, Ontario (ON) L1C 7B5
Canada

Dear Mike Pryde,

Please find enclosed your radiocarbon (C14) report for the material recently submitted. The result is reported as “% Biogenic Carbon”. This indicates the percentage carbon from “renewable” (biomass or animal by-product) sources versus petroleum (or otherwise fossil) sources . For reference, 100 % Biogenic Carbon indicates that a material is entirely sourced from plants or animal by-products and 0 % Biogenic Carbon indicates that a material did not contain any carbon from plants or animal by-products. A value in between represents a mixture of natural and fossil sources.

The analytical measurement is cited as “percent modern carbon (pMC)”. This is the percentage of C14 measured in the sample relative to a modern reference standard (NIST 4990C). The % Biogenic Carbon content is calculated from pMC by applying a small adjustment factor for C14 in carbon dioxide in air today. It is important to note is that all internationally recognized standards using C14 assume that the plant or biomass feedstocks were obtained from natural environments.

Reported results are accredited to ISO/IEC 17025:2017 PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators in Miami, Florida.

The international standard method utilized for this analysis is cited under Summary of Results. The standard version used is the latest available as of the date reported (unless otherwise noted). The report also indicates if the result is relative to total carbon (TC) or only total organic carbon (TOC). When interpreting the results, please consider any communications you may have had with us regarding the analysis. If you have any questions, please contact us. We welcome your inquiries.

Sincerely,



Carlos Barroso
Laboratory Management Group / AMS Pretreatment Manager

ISO/IEC 17025:2017-Accredited Testing Laboratory

Beta Analytic, LLC
4985 SW 74th Court
Miami, FL 33155 USA
Tel: (305) 667-5167
info@betalabservices.com

Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
E35A6E46EBEF10424FFD0A374A6367AE

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	July 9, 2025
Report Date	July 16, 2025
Sample Code	Walker - NY - 0725

Result

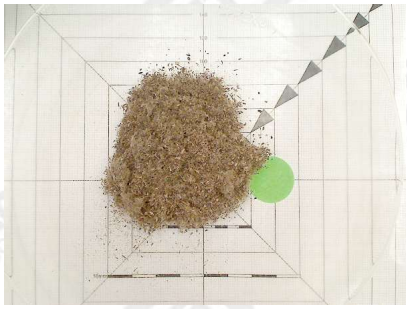
86% Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number	Beta-760026
Percent modern carbon (pMC)	85.93 +/- 0.18 pMC
Atmospheric adjustment factor (REF)	99.4; = pMC/0.994



Labeling COC


VOC (1mm x 1mm scale)


3087.3mg analyzed (1mm x 1mm scale)

Disclosures: All analytical work is performed by BETA Analytic's professional staff, in its laboratories on our AMS, IRMS, CRDS and GC instruments. No subcontractors are ever used. We are a tracer-free 14C facility that does not accept or analyze materials that might contain artificial 14C (from biomedical, environmental, or other studies). Quality Assurance is maintained through our ongoing ISO/IEC 17025:2017 Laboratory Testing Accreditation, and verified by Quality Assurance Reports, posted to the web-library along with this report.

The published report is final and non-modifiable.

This report has been built with the information provided on the online form by the client. If different reporting information is required, a new sample analysis must be performed, with a new online form filled out to include exactly the information requested on the form.

Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO2 in the air and/or from fossil carbon (more than 45,000 years old) such as petroleum or coal. The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.

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Summary of Results - % Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Validation:

Certificate Number:
E35A6E46EBEF10424FFD0A374A6367AE

To validate report, scan this QR code on a mobile device or go to https://verify.betalabservices.com and enter the requested information.

Submitter	Mike Pryde
Company	St. Marys Cement (Canada) - Ontario - Bowmanville Plant
Received Date	July 9, 2025
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Result

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Laboratory Number	Beta-760026
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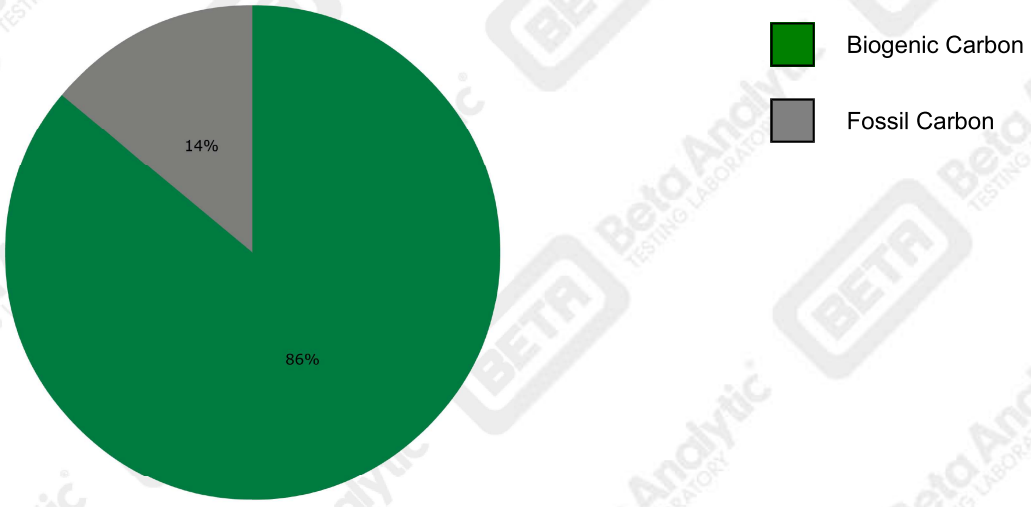

Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO2 in the air and/or from fossil carbon (more than 45,000 years old) such as petroleum or coal. The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.

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% Biogenic Carbon Content ASTM D6866-24 Method B (AMS) TC

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO2 emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-ba sed). By 2003 there was growing demand for a standardized methodology for applying Carbon -14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

The analytical procedures for measuring radiocarbon content using the different standards are identical. The only difference is the reporting format. Results are usually reported using the standardized terminology “% biobased carbon”. Only ASTM D6866 uses the term “% biogenic carbon” when the result represents all carbon present (Total Carbon) rather than just the organic carbon (Total Organic Carbon). The terms “% biobased carbon” and “% biogenic carbon” are now the standard units in regulatory and industrial applications, replacing obscure units of measure historically reported by radiocarbon dating laboratories e.g. disintegra tions per minute per gram (dpm/g) or radiocarbon age.

The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

Interpretation and application of the results is straightforward. A value of 100% biobased or biogenic carbon would indicate that 100% of the carbon came from plants or animal by-products (biomass) living in the natural environment and a value of 0% would mean that all of the carbon was derived from petrochemicals, coal and other fossil sources. A value between 0-100% would indicate a mixture. The higher the value, the greater the proportion of naturally sourced components in the material.

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Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990C and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

Report Date July 16, 2025

Submitter Mike Pryde

QA MEASUREMENTS

Reference 1	
Expected Value	0.44 +/- 0.04 pMC
Measured Value	0.44 +/- 0.04 pMC
Agreement	Accepted
Reference 2	
Expected Value	95.86 +/- 0.37 pMC
Measured Value	95.98 +/- 0.24 pMC
Agreement	Accepted
Reference 3	
Expected Value	110.69 +/- 0.40 pMC
Measured Value	110.75 +/- 0.28 pMC
Agreement	Accepted

Comment All measurements passed acceptance tests.

Validation 

Date July 16, 2025

SECTION G

This Section addresses Condition 16.1g) of the ECA described as below:

"A summary of dates, duration and reasons for any operational events including but not limited to events described in condition 8.7 of this Approval that may have negatively impacted the quality of the environment and corrective measures taken to address these impacts,"

st marys cement

St. Marys Cement - Bowmanville Plant
ECA Condition 16.1g: Reportable Operational Events - 2025
(ECA #0550-CEAHMA)

Date of Reportable Event	MECP Event ID	Report Filed to	Details of Event	Investigation	Final Response Given
2025-01-21	N/A	N/A	Exceedance of the Cove Rd. PM10 50ug/m3 24 hour rolling average standard at the SMC2 ambient station.	CBM activities in the quarry were not operating the appropriate water dust suppression controls. CBM retrained on procedures.	Action plan provided.
2025-01-21	N/A	David Keene (MECP)	Potential impact to the SO2 B1 limit	One of the fresh slurry discharge valves that transfer the slurry from the preparation tank to the absorption tower was faulty due to freezing media within the valve and pipe. Additionally, a control loop error that did automatically switch to the redundant equipment. Both have been promptly addressed are currently operational. Winterization of the valve was completed, along with a review of the current heat trace to improve. The control loop has been appropriately modified to switch to the next valve rack and pump system if this does occur again.	Incorporated into the NOx and SO2 abatement plan actions.
2025-03-17	SAC 1-J53IM0	David Keene (MECP)	The plant had a small fire close to the kiln oil pumps around 2:00PM. When the firefighters doused the fire with water, a small spill was created as the diesel-water mix flowed down the main plant drive-way.	The spill was immediately contained, and it did not flow to the natural environment, sewer manholes, or leave the property. Estimated diesel content to be <100L. Spill was cleaned up by emergency services the same day.	Action plan provided.
2025-05-23	SAC 1-OGKFWD	Marianne Brett (MECP)	Dust emission release from FM3 that was visible from off-site. It occurred from 11:51-12:10, at which the feed was stopped and along with it the emissions. There were no signs of dust leaving the property as the wind was blowing toward the SE and wind speed was low (around 10 KPH).	The Inlet spout and outlet bucket elevator both had sudden leaks, that were venting outside from the building.	Action plan provided.
2025-05-27	N/A	Marianne Brett (MECP)	Potential impact to the NOx B1 limit	Occurred during feed increase and an in-stack limit change based on the O.Reg 419/05 3 scenario limit set points based on production rate.	Incorporated into the NOx and SO2 abatement plan actions.
2025-06-05	SAC 1-OJETDT	Marianne Brett (MECP)	Cooler stack opacity exceedance from 23:42 06/05/2025 to 01:36 06/06/2025. There were x7, 6-minute average exceedances.	The high opacity occurred from a failure of bag filters within a specific compartment in the baghouse. The control room operator noted the emission and worked to isolate the problematic baghouse compartment. All bags were changed before the compartment was returned to operation.	Action plan provided.
2025-06-06	N/A	Marianne Brett (MECP)	Potential impact to the NOx B1 limit	Occurred during feed increase and an in-stack limit change based on the O.Reg 419/05 3 scenario limit set points based on production rate.	Incorporated into the NOx and SO2 abatement plan actions.
2025-06-12	N/A	Marianne Brett (MECP)	Due to a depletion of 19% Aqua Ammonia, the Nox B1 limit was potentially impacted.	Due to logistical issues, our ammonia supplier was unable to get to the site on time, and ammonia was depleted. As a temporary mitigation measure for the limited storage we have on site, we have arranged a truck tanker to be left on property (with spill containment). Unfortunately, the valve to open the flow of ammonia was seized, which prevented the ammonia supply from replenishing the ammonia process tank.	Incorporated into the NOx and SO2 abatement plan actions.
2025-06-17	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-06-18	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-11	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-13	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-14	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-15	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-16	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-21	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-07-29	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-07	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-17	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.

st marys cement

St. Marys Cement - Bowmanville Plant
ECA Condition 16.1g: Reportable Operational Events - 2025
(ECA #0550-CEAHMA)

Date of Reportable Event	MECP Event ID	Report Filed to	Details of Event	Investigation	Final Response Given
2025-08-18	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-19	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-21	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-22	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-25	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-08-28	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-09-05	SAC 1-pgL7Tk	Marianne Brett (MECP) Jeremy Weiss (MECP)	19% Aqua Ammonia spill from the pump transport line within the secondary containment area for the equipment.	At 3:45AM there was a 19% aqua ammonia leak from the main pump train. Emergency response protocol was initiated and GFL emergency response and the fire department were called. The ammonia transport pumps were immediately stopped and the leak subsided to a trickle. When GFL arrived they dawned self contained breathing apparatus and closed the manual ammonia valve which stopped the trickle leak at 7AM. Cleanup activities were initiated with GFL using a hydrovac and power wash, the activities were completed by 1PM. It was noted that upon inspection during and after cleanup, there was no evidence of ammonia contaminating anywhere outside of the engineered containment area designed as a secondary containment in case of leaks. Therefore, it is expected that the ammonia did not leave the secondary containment. The winds were blowing to the North and ammonia levels were measured as 0 ppm approximately 70' from the containment area. A walk through of the property was completed and no ammonia levels were noted outside of the 70' radius of the leak. Therefore, no ammonia odour would impact any offsite receptors. The total spill amount was approximately 50L within the secondary containment.	Action plan provided.
2025-09-05	SAC 1-PGQTXJ	Marianne Brett (MECP) Jeremy Weiss (MECP)	Dust emission from FM2 discharge stack that exceeded the regulatory standard of 20% 6-min rolling average.	FM2 hopper was overfilled and dislodgeed bag filters from the tube sheet. This allowed the hopper material to circumvent the bag filters and emit from the FM2 stack.	Action plan provided.
2025-09-05	N/A	Marianne Brett (MECP)	The Nox B1 limit was exceeded.	During the ammonia spill, the pumping equipment was isolated to stop the leaking ammonia. At this time the NOx exceeded as there was no ammonia supply to control NOx	Incorporated into the NOx and SO2 abatement plan actions.
2025-09-06	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-09-09	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-09-16	SAC 1-PIEYBL	Marianne Brett (MECP)	A dust emission from the ATOX occurred from 1:58PM to 3:50PM	High temperature caused the baghouse fan to go down. At this time, negative pressure was not maintained and there was a dust emission from the temperature control dampers.	Action plan provided.
2025-09-18	SAC 1-PIVDSJ	Marianne Brett (MECP)	Fresh slurry spill	•An I/O card failure occurred in the slurry preparation room. The faulty card has since been replaced. •Following the failure, the Control Room Operator manually opened the valve on the slurry preparation tank to maintain SO_2 reduction, as he had not communication due to the faulty I/O card. •This action led to an overflow in the pump room sump. •The flow rate from the slurry preparation tank exceeded the sump's capacity to transfer material to the absorption tower. •As a result, fresh slurry breached the containment area within the pump room. The contamination lasted approximately 15 minutes.	Action plan provided.
2025-09-18			Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-09-19			Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.

St. Marys Cement - Bowmanville Plant
ECA Condition 16.1g: Reportable Operational Events - 2025
(ECA #0550-CEAHMA)

Date of Reportable Event	MECP Event ID	Report Filed to	Details of Event	Investigation	Final Response Given
2025-09-20			Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-09-23			Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-10-01			Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-10-27	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-11-15	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	An increase in slurry dosing within the wet scrubber absorption tower has resulted in elevated slurry density. This high-density condition has restricted effective contact between the slurry and the flue gas, thereby reducing the efficiency of SO_2 absorption.	Incorporated into the NOx and SO2 abatement plan actions.
2025-12-29	N/A	Marianne Brett (MECP)	Potential impact to the SO2 B1 limit	Lost communication of SO2 signal due to configuration issues	Incorporated into the NOx and SO2 abatement plan actions.

SECTION H

This Section addresses Condition 16.1h) of the ECA described as below:

"Details of environmental complaints including a summary of complaints received, causes of complaints and action taken to avoid the recurrence of similar incidents, as described in condition 14 of this Approval."

St Marys Cement, Bowmanville Plant

ECA Condition 16. 1h: Community Concerns Log - 2025

(ECA #0550-CEAHMA)

Date of Complaint	Nature of Complaint	Summary of Complaint	Response Actions Taken and Conclusions
2025-07-16	Particulate on property	On July 16, 2025, a community member from Bowmanville reported particulate matter on their pool cover. Approximately 4.12 km northeast of the SMC Bowmanville Plant. Although the particulate resembled roof shingle debris, the complainant noted their roof was new, and the condition of neighboring roofs is unknown. Wind data showed directions that make it unlikely the material originated from the plant, especially during the morning hours. A sample collected on July 23 but was insufficient for instrumental analysis but appeared tar-like and slightly ignitable, suggesting a petroleum base. Preliminary findings indicate the material is unlikely to be from the SMC BOW plant, and further investigation is underway to identify other potential sources closer to the complaint site.	The material provided was not sufficient in quantity to conduct instrumental analysis. The material observed under a microscope and has a resemblance to tar. It was slightly ignitable under high temperature, indicating that is has a petroleum base. Based on the material resemblance, it looks unlikely to be representative of material produced or emitted at the SMC BOW plant. We are working to evaluate as compared to common materials, such as asphalt, to identify any commonalities. An air modelling exercise was completed and the conclusion indicated that levels at this distance from the plant was highly improbable. As a result MECP have setup sampling dishes to collect a sample to analyze.
2025-08-13	Particulate on property	On August 12, 2025, at 12:35 PM, a Bowmanville community member contacted me directly to report the presence of brown particulate matter at their residence. The particles were found on a vehicle, pool cover, and outdoor furniture. Although the complaint was directed toward particulate accumulation that morning, the community member noted that particulate matter is consistently found at this location almost daily. The initial investigation suggests the dust is unlikely to have originated from the SMC Bowmanville plant, which is located 4.12 km away and was upwind of the complaint site during the relevant time period. The particulate does not resemble typical emissions from the plant and the complaint location is at a considerable distance from the plant location. Further analysis is being conducted by the Quality Lab to identify the material, either through instrumental or microscopic methods, depending on sample quantity.	The material provided was not sufficient in quantity to conduct instrumental analysis. The material observed under a microscope and has a resemblance to tar. It was slightly ignitable under high temperature, indicating that is has a petroleum base. Based on the material resemblance, it looks unlikely to be representative of material produced or emitted at the SMC BOW plant. We are working to evaluate as compared to common materials, such as asphalt, to identify any commonalities. An air modelling exercise was completed and the conclusion indicated that levels at this distance from the plant was highly improbable. As a result MECP have setup sampling dishes to collect a sample to analyze.