PRE-TEST PLAN

ST MARYS CEMENT INC. (CANADA)

ST MARYS, ON

PRE-TEST PLAN COMPLIANCE SOURCE TESTING
ECA #6394-D78PR2 RWDI # 2402241
January 9, 2025

SUBMITTED TO

Ministry of the Environment
Technology Standards Section
6th Floor
40 St. Clair Ave. W.
Toronto, ON M4V1M2
source.testing@ontario.ca

CC TO

St Marys Cement Inc
Kara Pelissero
Environmental Manager
Kara.Pelissero@vcimentos.com

SUBMITTED BY

Karri Legarrie
Senior Project Manager
karri.legarrie@rwdi.com

RWDI AIR Inc.
Consulting Engineers & Scientists
600 Southgate Drive
Guelph Ontario Canada N1G 4P6
C: 807.621.1743
F: 519.823.1316

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1 INTRODUCTION

1.1 Summary

RWDI AIR Inc. (RWDI) has been retained by St. Marys Cement Inc. (Canada), (St Marys) to conduct emission sampling on the kiln exhaust at their facility in St Marys, Ontario. The testing is required under the Environmental Compliance Approval (ECA) #6394-D78PR2. The ECA is provided in Appendix A. Conventional fuels and Alternative Low-Carbon fuels (ALCF) will be used as specified in Condition 11.1(d) of the ECA.

The ALCF demonstration project Use in Condition 11.2 of the ECA is not scheduled as part of this test program. The Back-end Riser demonstration project is not expected to be operational till late 2025 or early 2026.

This stack testing study will consist of measuring the following parameters, as listed in Schedule H of the amended ECA. The testing will consist of three tests for each parameter:

- Particulate Matter (PM)
- Metals (as listed in ECA)
- Semi-Volatile Organic Compounds (SVOC's) (listed as Polycyclic Organic Matter in ECA)
- Dioxins, Furans and Dioxin-like PCB's (as listed in ECA)
- Hydrogen Chloride (HCl)
- Ammonia (NH_3)
- Aldehydes (Acrolein, Acetaldehyde, Propionaldehyde)
- Alcohols (Methanol, Phenol)
- Carbon Monoxide (CO)
- Oxygen (O_2)
- Carbon dioxide (CO_2)

A Pre-test Plan was initially submitted on September 18, 2024, under the revoked ECA #0706-CLVLC2, issued on August 17, 2023. However, testing under this ECA was not completed due to process issues. The testing program will now proceed under the Amended ECA #6394-D78PR2, issued on November 11, 2024. The commencement of operation of the ALCF was May 2024. The operation of the Electrolysis system has not started, and the start-up is not planned for the next few years.

Relative Accuracy Test Audit (RATA) will be conducted at a later date on the CEM system, and the report will be submitted to the District Manager as per Section 10.1 of the ECA.

1.2 Schedule

The testing is currently scheduled to take place during the week of April 7, 2025. Fifteen days notice will be provided to the Ministry of the Environment, Conservation and Parks (MECP) via e-mail, if the schedule changes.

Testing will be conducted Tuesday, Wednesday and Thursday. The following is the general day to day schedule:

Day 1 - Test 1 for PM / Metals Train
- Test 1 for (Dioxins/Furans and SVOC's)
- Tests 1 for VOC's, HCl and Ammonia, Aldehydes, Alcohols
- O_2, CO_2 CO continuous during above testing

Day 2 - Test 2 for PM / Metals Train
- Test 2 for (Dioxins/Furans and SVOC's)
- Tests 2 for VOC's, HCl and Ammonia, Aldehydes, Alcohols
- O_2, CO_2 CO continuous during above testing

Day 3 - Test 3 for PM / Metals Train
- Test 3 for (Dioxins/Furans and SVOC's)
- Tests 3 for VOC's, HCl and Ammonia, Aldehydes, Alcohols
- O_2, CO_2 CO continuous during above testing

1.3 Test Program Organization

Details with respect to the key individuals involved with the stack sampling survey are provided below.

Company Name:	St. Marys Cement
Company Address:	585 Water St South
Plant Location:	585 Water St South
St Marys, Ontario	
Plant Coordinator:	Kara Pelissero
Telephone Number:	519-284-1020 Ext 235
E-mail:	Kara.Pelissero@vcimentos.com
MOE District Office:	London District Office
Telephone Number:	519-873-5000
Sampling Company:	RWDI AIR Inc.
Project Manager:	Karri Legarrie
Telephone Number:	807-621-1743
Fax Number:	519-823-1316
Email:	Karri.Legarrie@rwdi.com
Laboratory:	ALS Global
Project Manager:	Ancy Sebastian
Telephone Number:	905-331-3111

2 SOURCE DESCRIPTION

2.1 Plant Location

The St Marys facility is located at 585 Water St. South. St Marys, Ontario.

2.2 Facility Description

The fundamental process of cement manufacturing consists of combining materials bearing calcium oxide, silica, alumina and iron oxide at high temperatures to produce cement clinker. The clinker is subsequently ground with finishing materials such as gypsum, limestone, clay and slag to produce cement.

The current ECA allows for use of conventional fuels, alternative low-carbon fuels, and Adjunct Fuel Material as defined in the ECA.

The cement plant operates 12 months per year typically on 24 hours per day, 7 days per week schedule, with a maximum production capacity of 1,100,000 tonnes per year.

2.3 Sample Location

The sampling location is accessible via the elevator and is marked as the 195ft above sea level. There are two ports spaced 90 degrees apart. This sampling location is considered 'ideal' as per the Ontario Source Test Code Method 1 since the nearest flow disturbances were greater than eight duct diameters upstream and two duct diameters downstream of the sample location. The diameter at the testing location is 2.4m.

3 TEST PROGRAM

3.1 Objectives

The purpose of the stack testing is to meet the conditions set by the Ontario Ministry of Environment, Conservation and Parks (MECP) Amended Environmental Compliance Approval #6394-D78PR2.

3.2 Test Methodology

The following table summarizes the test methodologies that will be followed during this program.

Table 3.1: Summary of Test Methodologies

Parameter	Proposed Reference Test Method
Flow Rate, Temperature, Moisture	OSTC[1] Methods ON-1 to ON-4
Particulate Matter	OSTC[1] Method ON-5
Metals (including Hg)	US EPA[2] Method 29
SVOC's	Environment Canada RM/2
Dioxins and Furans	Environment Canada RM/2
Oxygen and Carbon dioxide	US EPA[2] Method 3A
Carbon Monoxide	US EPA[2] Method 10
Aldehydes	NCASI Method A105
Methanol and Phenol	NCASI Method 98.01
Volatile Organic Matter	US EPA SW 846 0030 VOST
Hydrogen chloride and Ammonia	US EPA[2] Method 26 (non-isokinetic)

Notes:
[1] OSTC - Ontario Source Testing Code - Version 3
[2] U.S. EPA - United States Environmental Protection Agency

3.3 Description of Testing Methodology

The following section provides brief descriptions of the proposed sampling methods and discusses any proposed modifications to the reference test methods.

3.3.1 Stack Velocity, Temperature, and Volumetric Flow Rate Determination

The exhaust velocities and flow rates will be determined following the Ontario Source Testing Code (OSTC) Method 2, "Determination of Stack Gas Velocity and Flow Rate (Type S Pitot Tube)". Velocity measurements will be taken with a pre-calibrated S-Type pitot tube and incline manometer. Volumetric flow rates will be determined following the equal area method as outlined in OSTC Method 2. Temperature measurements will be made simultaneously with the velocity measurements and will be conducted using a chromel-alumel type "k" thermocouple in conjunction with a digital temperature indicator.

The dry molecular weight of the stack gas will be determined following calculations outlined in OSTC Method 3A, "Determination of Molecular Weight of Dry Stack Gas". Stack moisture content will be determined through direct condensation and according to OSTC Method 4, "Determination of Moisture Content of Stack Gas".

3.3.2 Sampling for Particulate Matter and Metals

Sampling for PM and metals will be performed in accordance with OSTC Method 5, "Sampling of Particulate Matter from Stationary Sources" and U.S. EPA Method 29 "Determination of Metals Emissions from Stationary Sources", respectively. Sampling will be conducted using an Environmental Supply C-5000 Source Sampling System. Both PM and metals will be sampled concurrently using the same sampling train. Triplicate sampling runs will be conducted.

The sample will be drawn through a glass lined sample probe and quartz fibre filter, which will be maintained at a temperature of 120 ± 14°C (248 ± 25°F). The sample will then be introduced into the impinger train. The impinger train will include two 5% HNO_3/10% H_2O_2 absorbing solution impingers, one empty impinger, two impingers containing acidified $KMnO_4$ solution and one impinger containing silica gel.

For the isokinetic testing, a total of 24 points (12 per traverse) will be used. Sampling duration will be 7.5 minutes per point with a total sampling time per isokinetic test of 180 minutes. Target sample volume will be 3.8 m^3 (135ft^3).

Upon completion of the test, the sampling train will be recovered, as in the procedures detailed in the reference method, and the samples will be packaged for transport to ALS Laboratories in Burlington, Ontario for analysis.

3.3.3 Sampling for SVOC's, Dioxin and Furan Isomers and Dioxin like PCB's

Sampling for these parameters will be done in accordance with Environment Canada Method RM/2. Each compound categories will be determined concurrently using the same sampling train.

The sample will be drawn through a glass lined sample probe and proofed glass fibre filter. Both will be maintained at a temperature of 120 ± 14°C (248 ± 25°F). The sample will then pass through a water-cooled condenser and an XAD-2 absorbent module. The temperature of the XAD-2 module will be kept below 20°C. The stack gas sample will then be introduced into the impinger train. The impinger train will be configured as specified in the reference method.

For the isokinetic testing, a total of 24 points (12 per traverse) will be used. Sampling duration will be 7.5 minutes per point with a total sampling time per isokinetic test of 180 minutes. Target sample volume will be 3.8 m^3 (135ft^3).

Upon completion of the test, the sampling train will be recovered, as in the procedures detailed in the reference method, and the samples will be packaged for transport to ALS Laboratories in Burlington, Ontario for analysis. The filter, XAD-2 module and all rinses will be analysed for the target compounds using high resolution mass spectrometry.

3.3.4 Sampling for Hydrogen Chloride, and Ammonia

Sampling for Hydrogen Chloride, and Ammonia will be completed following U.S. EPA Method 26 "Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources - Non-isokinetic Method". The sampling will be conducted using a midget impinger sampling train. The sample will be drawn through a Teflon lined probe, glass fibre filter and three-way stopcock which will be maintained at a temperature of 120 ± 14°C (248 ± 25°F). The sample will then enter the impinger train which consists of three impingers. The impingers in order include two acidic impingers, two basic impingers and a final silica impinger to dry the sample. Triplicate samples will be conducted at a collection rate of 1.5 liters per minute for a total test time of 60 minutes.

Upon completion of the testing, samples will be kept cool and submitted to ALS Laboratories in Burlington, Ontario for analysis.

3.3.5 Sampling for Aldehydes

Sampling for Acrolein, Acetaldehyde, and Propionaldehyde will be completed following NCASI Method A105 "Impinger Source Sampling Method for Aldehydes, Ketones and Polar Compounds".

Sample gas will be passed through three chilled aqueous impingers containing 25 ml of o-benzylhydroxylamine (BHA) solution. Sample volume will be measured with a VOST sampling console and a total of 30 liters will be collected over a 60-minute period (0.5 L/min).

Upon completion of the testing, samples will be kept cool and submitted to ALS Laboratory in Burlington, Ontario for analysis.

3.3.6 Sampling for Volatile Organic Compounds

Sampling for Volatile Organic Compounds (VOC) will be conducted using a volatile organic sampling train (VOST) following U.S. EPA SW846 Method 0030. Sample gas will be collected on a pair of adsorbent tubes, the first containing Tenax, and the second, a combination of Tenax/charcoal. Since it is expected that no visible condensate will buildup in the knockout flask located after the first tube, it will not be recovered for analysis. One pair of tubes will make up one test, and three tests will be performed. Each set of tubes will be sampled over a 60-minute period at 0.25 L/min. Samples will then be submitted to Bureau Veritas labs for analysis.

To ensure that no breakthrough has occurred through the VOST tubes, one test will involve analysing the tubes separately.

3.3.7 Sampling for Methanol and Phenol

The sampling for Methanol and Phenol will be performed using NCASI Impinger Method IM/CAN/WP-98.01. This sampling train will consist of 2 midget impingers containing 15mls of distilled, deionized water. Sample volume will be measured with a VOST sampling console and a total of 60 liters will be collected over a 60-minute time period (1L/min).

3.3.8 Continuous Emissions Monitoring for CO, CO_2, and O_2

Testing for O_2, CO_2 and CO will be accomplished using continuous emission monitors (CEMs). The exhaust gas sample will be withdrawn from a single point at the centre of the stack using a stainless-steel probe. The sample will then proceed to a heated filter, where particulate matter is removed, and then transferred via a heated Teflon

line to a sample conditioner. The Teflon line will be heated to 120°C (250°F) to prevent any condensation. The sample conditioner will remove any moisture in the exhaust. The sample will then be routed through a manifold system and introduced to the individual CEM's for measurement.

Prior to testing, sample system bias checks and instrument linearity checks (calibration error) will be conducted. In addition, the analysers will be calibrated (zeroed and span checked) at the completion of each run. Data acquisition will be provided using a National Instruments data logger system programmed to collect and record data at 1-second intervals. Average 1-minute concentrations will be calculated from the 1-second measurements

3.3.9 USEPA Method 205 – Dilution System

Calibration gas will be mixed using an Environics 4040 Gas Dilution System. The mass flow controllers are factory calibrated using a primary flow standard traceable to the United States National Institute of Standards and Technology (NIST). Each flow controller utilizes an 11-point calibration table with linear interpolation, to increase

accuracy and reduce flow controller nonlinearity. The calibration is done yearly, and the records will be included in the Source Testing Report**.** A multi-point EPA Method 205 check will be executed in the field prior to testing to ensure accurate gas-mixtures.

The gas dilution system consists of calibrated orifices or mass flow controllers and dilutes a high-level calibration gas to within ±2% of predicted values. The gas divider is capable of diluting gases at set increments and will be evaluated for accuracy in the field in accordance with US EPA Method 205 "*Verification of Gas Dilution Systems for Field Instrument Calibrations*". The gas divider dilutions will be measured to evaluate that the responses are within ±2% of predicted values. In addition, a certified mid-level calibration gas within ±10% of one of the tested dilution gases will be introduced into an analyzer to ensure the response of the gas calibration is within ±2% of gas divider dilution concentration.

3.4 Process Data

Operating conditions during the sampling will be monitored by St. Marys personnel. All equipment will be operated under normal (desired) conditions. Radio contact will be kept between the process operators and the sampling team. A member of the RWDI sampling team will contact the operator before each test, to ensure that the process is at normal (desired) operating conditions.

At the time of the sampling program, St. Marys will be operating at normal production rate. The Kiln is rated for 2,038 tonnes/day, however the normal production rate for the facility is between 1,700 and 2,200 tonnes/day of clinker. Alternatives Fuels will be added at a rate between 72 to 96 tonnes/day.

The table below shows the average Alternative Fuels rate (tonnes per day) for the past months.

	Sep-24	Oct-24	Nov-24	Dec-24
Average Alt Fuels rate (tpd)	59.9	59.0	39.4	30.8

St. Marys will ensure the fuel firing will be in accordance with section 11.1(d) of the ECA. For the 2025 source test the proposed blend of Alternative Low Carbon Fuels is as follows:

- Construction Wood waste: 25 - 50%
- Plastic: 50 - 75%

The above blends were chosen based on market availability.

The process information to be included in the source testing report shall include but not be limited to:

- Clinker production rate in tonnes/hour
- Conventional Fuels fired in the Cement Kiln in tonnes/hour
- Each category of the Alternative Low-Carbon fuels fired in the Cement Kiln in tonnes/day
- Fuel Adjunct Material and Industrial By-product material input into the Cement Kiln in tonnes/day
- Summary of Continuous Emission Monitoring System

3.4.1 Carbon Dioxide Emission Intensity

During the three days of source testing, representative samples of the Alternative Low-Carbon Fuels and the Conventional Fuels will be collected. These samples will be used for the Carbon Dioxide Emission Intensity testing. The sample collection and testing will be conducted in accordance with O. Reg. 79/15. St. Marys personnel will be collecting the sample and conducting the testing. The Carbon-Dioxide Emission Intensity report will be prepared to meet the requirements outlined in section 12(2) of the ECA, a copy of that report will be submitted with the source testing report.

4 INTERNAL QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

4.1 Overview

Applicable quality assurance measures will be implemented during the sampling program to ensure the integrity of the results. These measures will include detailed documentation of field data, equipment calibrations for all measured parameters, completion of Chain of Custody forms when submitting laboratory samples, and submission of field blank samples to the laboratories.

Quality control procedures specific to the CEM monitoring include linearity checks, to determine the instrument performance, and reproducibility checks prior to use in the field. Regular performance checks on each analyser will also be carried out during the testing program by performing routine zero checks and span calibration checks using primary gas standards. Sample system bias will also be calculated. These checks will be used to verify the ongoing precision of the monitor and sampling system over time. Pollutant-free (zero) air will be introduced to perform the zero checks, followed by a known calibration (span) gas into the monitor. The response of the monitor to pollutant-free air and the corresponding sensitivity to the span gas will be recorded regularly during the tests.

All samplers are bench tested and calibrated in RWDI's Guelph office prior to field deployment and, in many cases, calibrated again in the field before use. For each sample collected with a Method 5 sampling train, both pre- and post- leak checks will be conducted by plugging the inlet and drawing a vacuum of 380 mm of water for at least one minute. Dry gas meter reading leakage rates greater than 4 percent of the average sampling rate or 0.00057 m^3/min (0.02cfm), whichever is less, are unacceptable. Similar leak check procedures for the Pitot tube and pressure lines will be conducted. A number of blanks are included in the methods and will be submitted for analyses as well Chain of Custody forms will be completed and submitted along with the samples to the laboratory. All sampling media will be provided or prepared by the laboratory responsible for its subsequent analysis. All quality control and quality assurance measures will be recorded and will be included in the final report.

4.2 Sample Identification and Custody

The following person is responsible for sample handling and recording during this study:

Person Responsible:	Mr. Oluwatobi Odumoye, RWDI
Sample Identification:	Mr. Oluwatobi Odumoye, RWDI
Sample Log Sheet:	Mr. Oluwatobi Odumoye, RWDI

5 REPORTING REQUIREMENTS

5.1 Report Format

As indicated in the Amended Certificate of Approval, the stack testing report will include, as a minimum, the following:

- an executive summary;
- date, time and duration of each test;
- average of emission concentrations, rates, and calculations
- records of operating conditions including but not limited to;
  - executive summary
  - summary of fuel analysis specified in section 12.1 of ECA
  - records of operating conditions such as
    - Clinker production
    - Conventional Fuels fired in tonnes/hr
    - Each category of alternative fuels fired in tonnes/hr
    - Fuel Adjunct Material and Industrial By-product Material input into kiln in tonnes/day
    - Other records that may affect source testing results
- Summary of all records of the CEM and CPM system;
- Summary table comparing the measured results to the ESDM report and Performance limits;
- If source testing results are higher than the emission estimates (excluding ND values) in the ESDM Report, the company will update the ESDM report, the updated Emission Summary Table will be included in the source testing report.
- Field Data Sheets – electronic and raw.
- Analytical reports along with chain of custody documentation.

6 SAFTEY

The following table outlines the additional safety requirements for this survey as identified by RWDI.

Table 6.1: Safety Requirements

Head Protection	Required
Foot Protection	Required
Eye Protection	Required
Hearing Protection	Not required
Safety Belt or Harness	Not Required
Respiratory Equipment	Not required
Other Protective Clothing or Equipment	Not required
Safety Training Session	Required
Sampling Location	Floor level
Temperature of Sampling Location	Ambient temperature
Work Area	Ambient temperature
Other Safety Requirements	None

7 PERSONNEL RESPONSIBILITIES

7.1 Test Site Organization

The following individuals are responsible for the key tasks during the survey.

Task	Individual
Project Management:	Mrs. Karri Legarrie, RWDI
Test Preparation/Site Restoration:	Mrs. Kara Pelissero, St Marys Cement Inc.
Modifications to Facility/Services:	Mrs. Kara Pelissero, St Marys Cement Inc.
Sample Site Accessibility:	Mrs. Kara Pelissero, St Marys Cement Inc.
Data Recovery:	Mr. Oluwatobi Odumoye, RWDI
Sample Schedule:	Mr. Oluwatobi Odumoye, RWDI

7.2 Test Preparations

Personnel at the St. Marys plant will ensure that the plant is operating at acceptable capacity during the source testing. St. Marys personnel will also ensure that RWDI field crew have access to shelter, sampling ports and electrical power.

APPENDIX A

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 6394-D78PR2
Issue Date: November 11, 2024

St. Marys Cement Inc. (Canada)
55 Industrial St
Toronto, Ontario
M4G 3W9

Site Location: 585 Water St South
St. Marys Separated Town, County of Perth
N4X 1B6

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Description Section

A cement manufacturing facility, consisting of the following processes and support units:

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

including the Equipment and any other ancillary and support processes and activities, operating at a Facility Production Limit of up to a clinker production rate of 1.1 million tonnes per year, discharging to the air as described in the Original ESDM Report.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "ACB list" means the document entitled "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", as amended from time to time and published by the Ministry and available on a

Government website;

2. "Acceptable Point of Impingement Concentration" means a concentration accepted by the Ministry as not likely to cause an adverse effect for a Compound of Concern that,

   a. is not identified in the ACB list, or

   b. is identified in the ACB list as belonging to the category “Benchmark 2” and has a concentration at a Point of Impingement that exceeds the concentration set out for the contaminant in that document.

   With respect to the Original ESDM Report, the Acceptable Point of Impingement Concentration for a Compound of Concern mentioned above is the concentration set out in the Original ESDM Report;

3. "Acoustic Assessment Report" means the report, prepared in accordance with Publication NPC-233 and Appendix A of the Basic Comprehensive User Guide, by Petr Chocensky of HGC Engineering and dated August 31, 2023 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility, as updated in accordance with Condition 5 of this Approval;

4. "Acoustic Assessment Summary Table" means a table prepared in accordance with the Basic Comprehensive User Guide summarising the results of the Acoustic Assessment Report, as updated in accordance with Condition 5 of this Approval;

5. "Acoustic Audit" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the Facility, assessed to determine compliance with the Performance Limits for the Facility regarding noise emissions, completed in accordance with the procedures set in Publication NPC-103 and reported in accordance with Publication NPC-233;

6. "Acoustic Audit Report" means a report presenting the results of an Acoustic Audit, prepared in accordance with Publication NPC-233;

7. "Acoustical Consultant" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;

8. "Agricultural Waste" has the same meaning as defined in O. Reg. 347;

9. "Alternative Low-Carbon Fuels" means a fuel as defined in O. Reg. 79/15 and includes the materials approved under Condition 7 of this Approval;

10. "Approval" means this entire Environmental Compliance Approval and any Schedules to it;

11. "Basic Comprehensive User Guide" means the Ministry document titled "Basic Comprehensive Certificates of Approval (Air) User Guide" dated March 2011, as amended;

12. "Best Management Practices Plan" means the document titled "Best Management Practices Plan for the Control of Fugitive Dust Emissions - St. Mary's Cement Plant" Revision 8, dated February 2022, as amended;

13. "CAEAL" means the Canadian Association for Environmental Analytical Laboratories;

14. "Carbon Dioxide Emission Intensity" has the same meaning as defined under O. Reg. 79/15;

15. "Cement Kiln" means the cement kiln, firing Conventional Fuels, Alternative Low-Carbon Fuels, hydrogen and oxygen generated from the Electrolysis System, and Fuel Adjunct Material, described in the ESDM Report, this Approval, and in the supporting documentation referred to herein;

16. "CEM System" means the continuous monitoring and recording system used to measure the emissions from the Cement Kiln stack;

17. "CPM System" means the continuous monitoring and recording system used to measure the operational parameters of the Cement Kiln;

18. "Company" means St. Mary's Cement Inc. (Canada) that is responsible for the construction or operation of the Facility and includes any successors and assigns in accordance with section 19 of the EPA;

19. "Compound of Concern" means a contaminant described in paragraph 4 subsection 26 (1) of O. Reg. 419/05, namely, a contaminant that is discharged from the Facility in an amount that is not negligible;

20. "Conventional Fuels" means solid fuels including petroleum coke and coal for regular firing and also includes diesel, propane and natural gas for preheating during start-up;

21. "Demonstration Project" means a project that:

    a. involves the combustion of Alternative Low-Carbon Fuel, introduced through the back-end firing system of the Cement Kiln, for the purpose of manufacturing cement, at the Facility, and

    b. is carried out for the primary purpose of assisting in the design or assessing the merits of, or substantiating and showing the merits of a technology for the combustion described in definition 21.a.;

22. "Description Section" means the section on page one of this Approval describing the Company's operations and the Equipment located at the Facility and specifying the Facility Production Limit for

the Facility;

23. "Director" means a person appointed for the purpose of section 20.3 of the EPA by the Minister pursuant to section 5 of the EPA;

24. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located;

25. "Electrolysis System" means the Ultimate Cell Continuous Combustion (UC3) System described in the Original ESDM Report, or an equivalent system, where up to 30 normal cubic metres per hour of hydrogen and up to 15 normal cubic metres per hour of oxygen are generated and introduced into the fuel injection port of the cement kiln;

26. "Emission Summary Table" means a table described in paragraph 14 of subsection 26 (1) of O. Reg. 419/05;

27. "Environmental Assessment Act" means the *Environmental Assessment Act,* R.S.O. 1990, c.E.18;

28. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19;

29. "Equipment" means equipment or processes described in the ESDM Report, this Approval and in the Schedules referred to herein and any other equipment or processes;

30. "Equipment with Specific Operational Limits" means the Cement Kiln (except the fuel feed system feeding Alternative Low-Carbon Fuels, Conventional Fuels and Hydrogen to the Cement Kiln), and any other Equipment related to the thermal oxidation of waste or waste derived fuels, fume incinerators or any other Equipment that is specifically referenced in any published Ministry document that outlines specific operational guidance that must be considered by the Director in issuing an Approval;

31. "ESDM Report" means the most current Emission Summary and Dispersion Modelling Report that describes the Facility. The ESDM Report is based on the Original ESDM Report and is updated after the issuance of this Approval in accordance with section 26 of O. Reg. 419/05 and the Procedure Document;

32. "Facility" means the entire operation belonging to the Company's cement manufacturing facility located on the Property where the Equipment is located;

33. "Facility Production Limit" means the production limit placed by the Director on the main product(s) or raw materials used by the Facility;

34. "Fuel Adjunct Materials" means solid fuel, wholly used at the Facility, as supplementary fuels to coal and petroleum coke for firing the Cement Kiln, such as but not limited to carbon dust, metallurgical coke and carbon black, but which does not include Alternative Low-Carbon Fuels;

35. "Highest Ranking Person" means the highest ranking person regularly present at the Facility who has management responsibilities relating to the Facility;

36. "Independent Acoustical Consultant" means an Acoustical Consultant who is not representing the Company and was not involved in preparing the Acoustic Assessment Report or the design/implementation of Noise Control Measures for the Facility and/or Equipment. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment or the design/implementation of Noise Control Measures for the Facility and/or Equipment;

37. "Industrial By-Product Materials" means industrial by-product materials such as but not limited to iron slag from smelting industry, fly ash from coal fired generating plants, ash from waste water treatment plants and foundry sand used in casting processes, wholly used at the Facility as substitute raw material sources of calcium oxide, silica, iron oxide and alumina required for the ongoing cement manufacturing process and which do not serve as fuel for the Cement Kiln;

38. "Log" means a document that contains a record of each change that is required to be made to the ESDM Report and Acoustic Assessment Report, including the date on which the change occurred. For example, a record would have to be made of a more accurate emission rate for a source of contaminant, more accurate meteorological data, a more accurate value of a parameter that is related to a source of contaminant, a change to a Point of Impingement and all changes to information associated with a Modification to the Facility that satisfies Condition 2;

39. "Manager" means the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, as those duties relate to the conditions of this Approval;

40. "Minister" means the Minister of the Environment, Conservation and Parks or such other member of the Executive Council as may be assigned the administration of the EPA under the Executive Council Act;

41. "Ministry" means the ministry of the Minister;

42. "Modification" means any construction, alteration, extension or replacement of any plant, structure, equipment, apparatus, mechanism or thing, or alteration of a process or rate of production at the Facility that may discharge or alter the rate or manner of discharge of a Compound of Concern to the air or discharge or alter noise or vibration emissions from the Facility;

43. "Noise Abatement Action Plan" means the noise abatement program developed by the Company, submitted to the Director and District Manager and approved by the Director, designed to achieve compliance with the sound level limits set in Publication NPC-300, as applicable. It also means the Noise Abatement Action Plan outlined in the Acoustic Assessment Report;

44. "Noise Control Measures" means measures to reduce the noise emissions from the Facility and/or

Equipment including, but not limited to, silencers, acoustic louvres, enclosures, absorptive treatment, plenums and barriers. It also means the noise control measures outlined in the Acoustic Assessment Report;

45. "O. Reg. 79/15" means Ontario Regulation 79/15: Alternative Low-Carbon Fuels; as amended;

46. “O. Reg. 347” means Ontario Regulation 347: General – Waste Management; as amended;

47. "O. Reg. 419/05" means Ontario Regulation 419/05: Air Pollution – Local Air Quality, made under the EPA;

48. "Original ESDM Report" means the Emission Summary and Dispersion Modelling Report which was prepared in accordance with section 26 of O. Reg. 419/05 and the Procedure Document by BCX Environmental Consulting and dated June 2024 submitted in support of the application, and includes any changes to the report made up to the date of issuance of this Approval;

49. "Point of Impingement" has the same meaning as in section 2 of O. Reg. 419/05;

50. "Point of Reception" means Point of Reception as defined by Publication NPC-300;

51. "Pre-Test Plan" means a plan for the Source Testing including the information required in Section 5 of the Source Testing Code;

52. "Procedure Document" means Ministry guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2018, as amended;

53. "Processes with Significant Environmental Aspects" means the Equipment which, during regular operation, would discharge one or more contaminants into the air in an amount which is not considered as negligible in accordance with section 26 (1) 4 of O. Reg. 419/05 and the Procedure Document;

54. "Property" means the single property jointly occupied by St. Marys Cement Inc. (Canada) cement manufacturing facility, the high calcium dried limestone manufacturing facility operated by Canada Building Material Co., and the dual-fuel fired truck heating system operated by Laidlaw Carriers Bulk, as described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;

55. "Publication NPC-207" means the Ministry draft technical publication "Impulse Vibration in Residential Buildings", November 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, published by the Ministry, August 1978, as amended;

56. "Publication NPC-233" means the Ministry Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995, as amended;

57. "Publication NPC-300" means the Ministry Publication NPC-300, “Environmental Noise Guideline,

Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended;

58. "Report EPS1/PG/7" means means the document published by Environment Canada entitled "Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Power Generation";

59. "Schedules" means the following schedules attached to this Approval and forming part of this Approval namely:

    - Schedule A - Supporting Documentation
    - Schedule B - Performance Requirements - In-Stack Emission Limits
    - Schedule C - Emission Control Equipment Operational Requirements
    - Schedule D - Material Analysis Contaminants
    - Schedule E - Continuous Monitoring System Requirements
    - Schedule F - Alternative Low-Carbon Fuels Operational Requirements
    - Schedule G - Procedure for Source Testing
    - Schedule H - Test Sources and Test Contaminants

60. "Source Testing" means sampling and testing to measure emissions resulting from operating the test sources under conditions which yield the worst case emissions within the approved operating range of the test sources which satisfies paragraph 1 of subsection 11(1) of O. Reg. 419/05;

61. "Source Testing Code" means the Ontario Source Testing Code, dated June 2010, prepared by the Ministry, as amended;

62. "Toxicologist" means a qualified professional currently active in the field of risk assessment and toxicology that has a combination of formal university education, training and experience necessary to assess contaminants;

63. "Woodwaste" has the same meaning as defined in O. Reg 347; and

64. "Written Summary Form" means the electronic questionnaire form, available on the Ministry website, that documents whether Modifications were undertaken at the Facility and compliance with the Approval, in the previous calendar year.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

1. Except as otherwise provided by this Approval, the Facility shall be designed, developed, built,

operated and maintained in accordance with the terms and conditions of this Approval and in accordance with the following Schedules attached hereto:

- Schedule A - Supporting Documentation
- Schedule B - Performance Requirements - In-Stack Emission Limits
- Schedule C - Emission Control Equipment Operational Requirements
- Schedule D - Material Analysis Contaminants
- Schedule E - Continuous Monitoring System Requirements
- Schedule F - Alternative Low-Carbon Fuels Operational Requirements
- Schedule G - Procedure for Source Testing
- Schedule H - Test Sources and Test Contaminants

2. The use of Alternative Low-Carbon Fuels is approved at the Facility under the requirements of O. Reg. 79/15, and pursuant to Section 3 of O. Reg. 79/15, section 27 of the EPA does not apply to the Facility.

2. LIMITED OPERATIONAL FLEXIBILITY

1. Pursuant to section 20.6 (1) of the EPA and subject to Conditions 2.2 and 2.3 of this Approval, future construction, alterations, extensions or replacements are approved in this Approval if the future construction, alterations, extensions or replacements are Modifications to the Facility that:

   a. are within the scope of the operations of the Facility as described in the Description Section of this Approval;

   b. do not result in an increase of the Facility Production Limit above the level specified in the Description Section of this Approval; and

   c. result in compliance with the performance limits as specified in Condition 4.

2. Condition 2.1 does not apply to,

   a. the addition of any new Equipment with Specific Operational Limits or to the Modification of any existing Equipment with Specific Operational Limits at the Facility;

   b. alteration of the Alternative Low-Carbon Fuels and the increase in the quantity of Alternative Low-Carbon Fuels specified in Condition 7 of this Approval; and

   c. Modifications to the Facility that would be subject to the Environmental Assessment Act.

3. Condition 2.1 of this Approval shall expire ten (10) years from the date of this Approval, unless this Approval is revoked prior to the expiry date. The Company may apply for renewal of Condition 2.1 of this Approval by including an ESDM Report and an Acoustic Assessment Report that describes the Facility as of the date of the renewal application.

3. REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION

1. Prior to making a Modification to the Facility that satisfies Condition 2.1.a. and 2.1.b., the Company shall prepare a proposed update to the ESDM Report to reflect the proposed Modification.

2. The Company shall request approval of an Acceptable Point of Impingement Concentration for a Compound of Concern if the Compound of Concern is not identified in the ACB list as belonging to the category "Benchmark 1" and a proposed update to an ESDM Report indicates that one of the following changes with respect to the concentration of the Compound of Concern may occur:

    a. The Compound of Concern was not a Compound of Concern in the previous version of the ESDM Report and

        i. the concentration of the Compound of Concern exceeds the concentration set out for the contaminant in the ACB list; or

        ii. the Compound of Concern is not identified in the ACB list; or

    b. The concentration of the Compound of Concern in the updated ESDM Report exceeds the higher of,

        i. the most recent Acceptable Point of Impingement Concentration, and

        ii. the concentration set out for the contaminant in the ACB list,if the contaminant is identified in that document.

3. The request required by Condition 3.2 shall propose a concentration for the Compound of Concern and shall contain an assessment, performed by a Toxicologist, of the likelihood of the proposed concentration causing an adverse effect at Points of Impingement.

4. If the request required by Condition 3.2 is a result of a proposed Modification described in Condition 3.1, the Company shall submit the request, in writing, to the Director at least 30 days prior to commencing to make the Modification. The Director shall provide written confirmation of receipt of this request to the Company.

5. If a request is required to be made under Condition 3.2 in respect of a proposed Modification described in Condition 3.1, the Company shall not make the Modification mentioned in Condition 3.1 unless the request is approved in writing by the Director.

6. If the Director notifies the Company in writing that the Director does not approve the request, the Company shall,

a. revise and resubmit the request; or

b. notify the Director that it will not be making the Modification.

7. The re-submission mentioned in Condition 3.6 shall be deemed a new submission under Condition 3.2.

8. If the Director approves the request, the Company shall update the ESDM Report to reflect the Modification.

9. Condition 3 does not apply if Condition 2.1 has expired.

4. PERFORMANCE LIMITS

1. Subject to Condition 4.2, the Company shall not discharge or cause or permit the discharge of a Compound of Concern into the air if,

   a. the Compound of Concern is identified in the ACB list as belonging to the category "Benchmark 1" and the discharge results in the concentration at a Point of Impingement exceeding the Benchmark 1 concentration; or

   b. the Compound of Concern is not identified in the ACB list as belonging to the category “Benchmark 1” and the discharge results in the concentration at a Point of Impingement exceeding the higher of,

      i. if an Acceptable Point of Impingement Concentration exists, the most recent Acceptable Point of Impingement Concentration, and

      ii. the concentration set out for the contaminant in the ACB list, if the contaminant is identified in that document.

2. Condition 4.1 does not apply if the benchmark set out in the ACB list has a 10-minute averaging period and no ambient monitor indicates an exceedance at a Point of Impingement where human activities regularly occur at a time when those activities regularly occur.

3. The Company shall:

   a. fully implement the Noise Control Measures as outlined in the Noise Abatement Action Plan by no later than August 31, 2027;

   b. ensure subsequent to the completion of the Noise Abatement Action Plan that the noise emissions from the Facility comply with the limits in Ministry Publication NPC-300;

c. ensure that the Noise Control Measures are properly maintained and continue to provide the acoustic performance outlined in the Acoustic Assessment Report; and

d. ensure that any and all operations at the Facility are done so in accordance with the information presented in Table 1 of the Acoustic Assessment Report.

4. The Company shall ensure that the vibration emissions from the Facility comply with the limits set out in Ministry Publication NPC-207.

5. The Company shall operate any Equipment with Specific Operational Limits approved by this Approval in accordance with the Original ESDM Report.

6. The Company shall ensure that at all times when Alternative Low-Carbon Fuels are co-fired with Conventional Fuels in the Cement Kiln, the discharge from the Cement Kiln complies with the performance requirements specified in Schedule B of this Approval.

5. DOCUMENTATION REQUIREMENTS

1. The Company shall maintain an up-to-date Log.

2. No later than June 30 of each year, the Company shall update the Acoustic Assessment Report and shall update the ESDM Report in accordance with section 26 of O. Reg. 419/05 so that the information in the reports is accurate as of December 31 in the previous year.

3. The Company shall make the Emission Summary Table (see section 27 of O. Reg. 419/05) and Acoustic Assessment Summary Table available for examination by any person, without charge, by posting it on the Internet or by making it available during regular business hours at the Facility.

4. The Company shall, within three (3) months after the expiry of Condition 2.1 of this Approval, update the ESDM Report and the Acoustic Assessment Report such that the information in the reports is accurate as of the date that Condition 2.1 of this Approval expired.

5. Conditions 5.1 and 5.2 do not apply if Condition 2.1 has expired.

6. WRITTEN SUMMARY FORM

1. Subject to Condition 6.2, the Company shall prepare, and make available to the Ministry upon request, no later than August 31 of each year, a Written Summary Form signed by the Highest Ranking Person.

2. Condition 6.1 does not apply if:

a. Condition 2.1 has expired; and

b. the Written Summary Form has been completed for the year in which Condition 2.1 expired.

7. APPROVED ALTERNATIVE LOW-CARBON FUELS

1. The following Alternative Low-Carbon Fuels are approved for use as a fuel in the Cement Kiln at the Facility:

   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 (residue including plastic trimmings, staples, paper fibre and metal wire), end rolls and cores; and

   e. Material that is comprised of rubber (non-tire derived), including but not limited to shredded conveyor belt rubber.

2. Notwithstanding Condition 7.1 of this Approval, the Company shall ensure that the Alternative Low-Carbon Fuels are not derived from or composed of any material set out in Schedule 1 of O. Reg. 79/15.

3. The combined amount of Alternative Low-Carbon Fuels approved under Condition 7.1 of this Approval, subjected to thermal processing in the Cement Kiln (including for the purposes of the Demonstration Project) shall not exceed 175 tonnes per day.

8. OPERATION AND MAINTENANCE

1. The Company shall prepare and implement, not later than three (3) months from the date of this Approval, operating procedures and maintenance programs for all Processes with Significant Environmental Aspects, which shall specify as a minimum:

   a. frequency of inspections and scheduled preventative maintenance;

b. procedures to prevent upset conditions;

c. procedures to minimize all fugitive emissions;

d. procedures to prevent and/or minimize odorous emissions;

e. procedures to prevent and/or minimize noise emissions;

f. procedures for record keeping activities relating to the operation and maintenance programs;

g. acceptable range of the static pressure drop for the process dust control equipment listed in Schedule C of this Approval;

h. program to continuously monitor and record the pressure differential across each baghouse dust collector and the applicable operational parameters of the electrostatic precipitator specified as Primary Equipment in Schedule C of this Approval, including procedures to investigate and correct the cause of any anomalous measurements of the operational parameter;

i. program to periodically monitor and record the pressure differential across each baghouse dust collector specified as Secondary Equipment in Schedule C of this Approval, including procedures to investigate and correct the cause of any anomalous measurements;

j. list of management and supervisory personnel responsible for the operation and maintenance of the emission control equipment specified in Schedule C of this Approval.

2. The Company shall maintain and update to keep current, a list of all process dust control equipment, including the following details:

   Source identification; Production building/area served; Process/location served; Stack gas flow rate; Filter area (as applicable); Stack diameter and Stack height above grade.

3. The Company shall ensure that all Processes with Significant Environmental Aspects are operated and maintained in accordance with this Approval, the operating procedures and maintenance programs.

4. The Company shall prepare, update as necessary and implement, not later than three (3) months prior to the implementation of Alternative Low-Carbon Fuels operation at the Facility, procedures for the handling, processing and combustion in the Cement Kiln of Alternative Low-Carbon Fuels, including but not limited to:

   a. operating and maintenance procedures in accordance with good engineering practices and as recommended by the equipment suppliers;

b. start-up, shut-down and emergency measures;

c. procedures for handling, storage, maintenance and conveyance of Alternative Low-Carbon Fuels and the inspection of such facilities in accordance with the requirements set out in O. Reg. 79/15;

d. procedures for record keeping activities, including but not limited to the record keeping requirements for Alternative Low-Carbon Fuels facility inspection, and Alternative Low-Carbon Fuels use and transport, in accordance with the requirements set out in O. Reg. 79/15;

5. The Company shall ensure that the Facility/Equipment is properly designed and operated at all times while firing Alternative Low-Carbon Fuels and comply with the operational requirements set out in Schedule F of this Approval.

6. Alternative Low-Carbon Fuels shall be fired in accordance with the operating procedures and shall only be fired once the Cement Kiln has achieved normal operation, temperatures and production and shall be introduced directly into the Cement Kiln to maintain the requirements set out in Schedule F of this Approval.

7. The introduction of Alternative Low-Carbon Fuels in the Cement Kiln shall be stopped (following appropriate procedures) if:

   a. the temperature, residual oxygen or pressure as measured by the CPM System do not meet the operational requirements outlined in Schedule F of this Approval for more than four (4) consecutive hours; or

   b. the CPM System for one or more of the parameters specified in condition 8.7 (a) are down or malfunctioning for more than four (4) consecutive hours.

8. The Company shall comply with the following Alternative Low-Carbon Fuels storage requirements:

   a. the Alternative Low-Carbon Fuels shall be stored indoors or in enclosed containers, and the storage location shall be secure;

   b. the maximum amount of Alternative Low-Carbon Fuels stored and the maximum time periods for which the Alternative Low-Carbon Fuels can be stored shall be in accordance with the requirements set out in O. Reg. 79/15; and

   c. the Alternative Low-Carbon Fuels stored shall be combusted in the Cement Kiln.

9. The Company shall record the following data during Cement Kiln operation:

a. daily combined raw feed in the Cement Kiln in tonnes per day;

b. daily Alternative Low-Carbon Fuels fired in the Cement Kiln in tonnes per day, for each category of Alternative Low-Carbon Fuels approved under Condition 7 of this Approval;

c. daily Conventional Fuels fired in the Cement Kiln in tonnes per day;

d. hours of operation of each of the Electrolysis System units in hours per day and the amount of hydrogen and oxygen produced by each Electrolysis System units and introduced in the cement kiln in normal cubic metres per hour;

e. daily Fuel Adjunct Material and Industrial By-Product Material in tonnes per day used in the Cement Kiln;

f. daily clinker production in tonnes per day;

g. records of any incidents specified in Condition 8.7 of this Approval, and

h. any start-up, shut-down and malfunction incidents.

10. The Company shall not engage in the Demonstration Project:

a. at any time after three (3) years from the date that Alternative Low-Carbon Fuel is first combusted for the purposes of the Demonstration Project;

b. for more than a total of ninety (90) days in any twelve (12) month period; and,

c. for more than thirty (30) consecutive days.

11. The Company shall within two (2) weeks notify the Director and the District Manager in writing of:

a. the date when Alternative Low-Carbon Fuel is first combusted at the Facility for the purposes of the Demonstration Project.

9. MATERIAL ANALYSIS AND CRITERIA FOR ACCEPTANCE - ALTERNATIVE LOW-CARBON FUELS, INDUSTRIAL BY-PRODUCT AND FUEL ADJUNCT MATERIAL

1. The Company shall ensure that a material analysis program and criteria for acceptance for Alternative Low-Carbon Fuels is implemented as follows:

a. A protocol for Alternative Low-Carbon Fuels vendor screening, sampling and analysis shall be immediately implemented in accordance with the document "Alternative Low-Carbon Fuel Handling Procedures and Testing Manual, St. Mary's Cement Inc. (Canada)- St. Mary's Cement Plant, Version 1.0- March, 2022 revision, as amended. At a minimum, the Alternative Low-Carbon Fuels analysis parameters shall comply with the criteria specified in Table 1, Table 2 and Table 3 of this document. Any change in the criteria specified in Table 1, Table 2 and Table 3 shall be finalized in consultation with the District Manager.

b. If the analysis results of the Alternative Low-Carbon Fuels indicate that the emission rates of contaminants from the Cement Kiln are higher than the maximum emission rates identified in the maximum emission scenario outlined in the ESDM Report, the Company shall update the ESDM Report with the emission rates derived from this analysis in accordance with the document "Alternative Low-Carbon Fuel Handling Procedures and Testing Manual, St. Mary's Cement Inc. (Canada)- St. Mary's Cement Plant, Version 1.0- March, 2022, as amended.

2. The Company shall ensure that the following material analysis program to measure and record the concentration of contaminants for Industrial By-Product Material and Fuel Adjunct Material is implemented as follows:

a. For each material used as Fuel Adjunct Materials, the Company shall obtain a metals/metal hydrides scan, including at a minimum the contaminants listed in Schedule D on a quarterly or Lot basis, as applicable. The Company shall ensure that the standard sampling methods outlined in the document "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, Ontario Ministry of the Environment and Energy, Standards Development Branch, December, 1996" are used, and that the samples are submitted to a CAEAL certified laboratory for analysis.

b. For each material used as Industrial By-Product Materials, the Company shall obtain a metals/metal hydrides scan, including at a minimum the contaminants listed in Schedule D, on a quarterly or Lot basis, as applicable. The Company shall ensure that the standard sampling methods outlined in the document "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, Ontario Ministry of the Environment and Energy, Standards Development Branch, December, 1996" are used, and that the samples are submitted to a CAEAL certified laboratory for analysis.

c. At any time, should the Company either independently or through other sources reasonably expect other metal/metal hydrides not outlined under Schedule D to be present in any material at greater than the trace concentrations, the Company shall obtain the appropriate analysis forthwith.

d. Upon receipt of the analysis, the Company shall ensure that the Point of Impingement concentrations of metal/metal hydrides do not exceed the respective performance limits based on the maximum emissions scenario outlined in the ESDM Report.

e. The Company shall limit the accumulation of Industrial By-Product Materials and other raw materials in exterior storage piles to amounts which may reasonably be expected to be necessary for use in the cement manufacturing processes.

f. The Company shall ensure that any Industrial By-Product Material stored at the Facility which the Company determines cannot be utilized in ongoing cement manufacturing processes, is managed in accordance with applicable waste management regulations, and, where an Industrial By-Product Material becomes unusable, the Company shall advise the District Manager in writing, of the type and quantity of such material, the reasons why it cannot be used and the specific manner in which the material is to be managed as a waste.

g. The Company shall continue to prepare an annual summary report documenting the use of Industrial By-Product Materials and Fuel Adjunct Materials received at the Facility for the preceding calendar year. This summary report shall be submitted to the District Manager within sixty (60) days following the close of each calendar year and shall include a summary of the information set out in Condition No. 9.1 of this Approval.

10. CONTINUOUS MONITORING

1. Continuous Emissions Monitoring in the Kiln Stack

a. The Company shall ensure that the CEM System continuously monitors the following parameters in the exhaust gas stream from the Cement Kiln stack:

i. Nitrogen Oxides

ii. Sulphur Dioxide, and

iii. Opacity

b. The CEM System for nitrogen oxides and sulphur dioxide shall be installed, operated, maintained and quality assurance conducted and reported in accordance with the requirements set out in Report EPS1/PG/7. The annual Relative Accuracy Test Audit (RATA) report, including the required production data during the testing shall be submitted to the Manager and District Manager by June 30 of each year, for the previous calendar year. The quarterly cylinder gas audit reports shall be made available to the Ministry upon request.

c. The CEM System for monitoring opacity shall comply with the requirements outlined in Schedule E.

2. Continuous Monitoring of Process Conditions

a. The Company shall install, operate and maintain a CPM System to continuously monitor:

i. residual oxygen at locations specified in Schedule F;

ii. carbon monoxide in the preheater tower;

iii. temperature of gases in the preheater tower, as specified in Schedule F and correspond with a retention time of not less than 10 seconds;

iv. pressure at locations specified in Schedule F; and,

v. Total Hydrocarbon (as methane) in the gases leaving the Cement Kiln stack.

b. The CPM System specified in condition 10.2.a shall be designed, operated and maintained in accordance with an approved continuous monitoring plan, complete with specifications based on manufacturer's specifications and manuals. In this regard, the continuous monitoring plan shall be revised to assure proper calibration, maintenance and operation of the CPM System, in order to establish its performance on a continuous basis. The revised continuous monitoring plan shall be provided to the Manager for approval three (3) months prior to the implementation of the Alternative Low-Carbon Fuels operation at the Facility.

3. Continuous Monitoring Documentation

a. The Company shall prepare and retain on site monthly reports of the data monitored during the preceding month by the CEM System and CPM System, summarizing the following as a minimum:

i. the daily minimum, maximum and average readings for the parameters specified in condition 10 of this Approval on a monthly basis;

ii. the percent availability of the CEM System and CPM System for the parameters specified in condition 10 of this Approval on a monthly basis; and

iii. daily operational status (on/off) of the raw mill and the fuel mill on a monthly basis.

b. After one (1) month of the date of commencement of operation of the Electrolysis System, the Company shall prepare monthly reports by the end of the following month, including the data monitored during the preceding month, for the following parameters as a minimum:

i. the hourly average readings for the parameters specified in Conditions 10.1, 10.2 and 8.9.d. of this Approval, maintained electronically in a spreadsheet format;

ii. the parameters specified in Conditions 8.9.a, 8.9.b, 8.9.c, 8.9.e, and 8.9.f of this Approval.

c. The Company shall retain the monthly reports included in Conditions 10.3.a and 10.3.b of this Approval at the Facility, and when requested provide these to the District Manager and the Manager within 15 days of the date of the request.

d. The District Manager may relax the frequency and/or scope of the reports required under Condition 10.3 of this Approval, if the data is observed to be within the performance requirements of the Approval on a consistent basis.

e. The Company shall establish the normal operating concentration range for total hydrocarbon for baseline conditions (operating conditions which include the use of Conventional Fuel, Fuel Adjunct Materials and Industrial By-Product Materials in the Cement Kiln) based on CPM System data. The Company shall, at a minimum on a quarterly basis, review the CPM System data and identify and investigate any anomalous total hydrocarbon concentrations when using Alternative Low-Carbon Fuels. An investigations report shall be prepared and retained on site.

f. The Company shall retain on site, all raw data generated by the CEM System and CPM System for a minimum of five (5) years from the date of their creation.

11. SOURCE TESTING

1. REGULAR ALCF USE (Main Burner)

a. The Company shall perform Source Testing in accordance with the procedure in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H. Source Testing shall be conducted not later than twelve (12) months from the date of commencement of operation of the Alternative Low-Carbon Fuels feed equipment which permits the use of Alternative Low-Carbon Fuels up to 175 tonnes per day, or within a time frame as directed or agreed to in writing by the District Manager.

b. The Company shall notify the District Manager in writing of the details of the installed equipment, date of installation and date of commencement of operation of the Alternative Low-Carbon Fuels feed equipment which permits the use of Alternative Low-Carbon Fuels up to 175 tonnes per day within two (2) weeks of the installation and the commencement of operation.

c. In addition to Source Testing required under Conditions 11.1.a of this Approval, Source Testing shall be repeated once every calendar year in accordance with the procedure in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H. Annual Source Testing is not required to be conducted in the year in which Source Testing required under Condition 11.1 was conducted.

d. The Source Testing required under Conditions 11.1.a and 11.1.c of this Approval shall include, as a minimum, the rates of emissions of the test contaminants from the Cement Kiln stack, when the Cement Kiln is co-fired with Conventional Fuels and Alternative Low-Carbon Fuels, at an Alternative Low-Carbon Fuels maximum approved firing rate of 175 tonnes per day, or at a firing rate agreed to in writing by the Manager, subject to the condition that operational checks of the Cement Kiln are accepted by the Company. The Alternative Low-Carbon Fuels used during the Source Testing shall contain a representative blend of the Alternative Low-Carbon Fuels approved under Condition 7 of this Approval, with considerations of the market availability of Alternative Low-Carbon Fuels types and quantities at the time of Source Testing. The blend (s) of Alternative Low-Carbon Fuels and quantity proposed to be used for the Source Testing shall be submitted along with the Pre-Test Plan to the Manager and the Director for approval, along with the details regarding the process for selection of the Alternative Low-Carbon Fuels blend (s) and quantity for Source Testing.

e. The Company shall perform Source Testing in accordance with the procedures in Schedule G to determine the rate of emission of the test contaminants from the sources specified in Schedule H during the regular operation of the Electrolysis System. Source Testing shall be conducted not later than six (6) months from the date of commencement of operation of the Electrolysis System and shall be conducted while Conventional Fuels and Alternative Low-Carbon Fuels are used as required for Source Testing in Condition 11.1.d of this Approval.

f. The Company shall notify the District Manager in writing of the date of installation and the date of commencement of operation of the Electrolysis System within two (2) weeks of the installation and the commencement of operation.

g. The District Manager may relax the frequency and/or scope of the annual Source Testing required under Condition 11.1.c of this Approval, if the results of the annual Source Testing program indicate that the emissions and Point of Impingement concentrations of Compounds of Concern are consistently recorded as insignificant when substituting a portion of Conventional Fuels with Alternative Low-Carbon Fuels.

2. ALCF DEMONSTRATION PROJECT USE (Back-end Riser)

a. The Company shall conduct Source Testing in accordance with the procedure in Schedule G, to determine the rates of emissions of the Test Contaminants from the sources specified in Schedule H. The Source Testing shall be conducted not later than one (1) year from the date of the first use of Alternative Low-Carbon Fuel in the Cement Kiln for the purposes of the Demonstration Project. As a minimum, the Source Testing shall include the following scenarios:

i. Baseline Conditions: the rates of emissions of the Test Contaminants from the Cement Kiln exhaust stack when it is co-fired with Conventional Fuel and Alternative Low-Carbon Fuel introduced through the Main Burner.

ii. Alternative Low-Carbon Fuel Co-firing Conditions: the rates of emissions of the Test Contaminants from the Cement Kiln exhaust stack when it is co-fired with Conventional Fuel and Alternative Low-Carbon Fuel (introduced through the riser), at an Alternative Low-Carbon Fuel maximum approved firing rate of 175 tonnes per day, or at a firing rate agreed to in writing by the Manager, subject to the condition that operational checks of the Cement Kiln are accepted by the Company.

12. CARBON DIOXIDE EMISSION INTENSITY TESTING

1. The Company shall perform Carbon-Dioxide Emission Intensity testing of the representative samples of the Alternative Low-Carbon Fuels and Conventional Fuels at all times when Source Testing is carried out under Condition 11 of this Approval. Representative samples of the Alternative Low-Carbon Fuels and Conventional Fuels used during the Source Testing events shall be used for performing Carbon-Dioxide Emission Intensity testing. The Carbon-Dioxide Emission Intensity testing shall be carried out in accordance with the requirements set out in O. Reg. 79/15.

2. The Company shall prepare a Carbon-Dioxide Emission Intensity report in respect of the Alternative Low-Carbon Fuels combusted at the site, in accordance with the requirements set out in O. Reg. 79/15, that includes a statement that the Carbon-Dioxide Emission Intensity of the Alternative Low-carbon Fuels are less than the Carbon Dioxide Emission Intensity of the Conventional Fuels in the place of which the Alternative Low-Carbon Fuels are proposed to be combusted.

3. The Company shall submit the Carbon-Dioxide Emission Intensity report along with the Source Testing report to the District Manager.

13. FUGITIVE EMISSIONS CONTROL

1. The Company shall update as necessary and implement the Best Management Practices Plan for the control of fugitive dust emissions.

2. The Company shall:

   a. review and evaluate the Best Management Practices Plan on an annual basis;

   b. record the results of each annual review and update as required the Best Management Practices Plan within two (2) months of the completion of the annual review;

   c. maintain the updated Best Management Practices Plan at the Facility;

   d. implement, at all times, the most recent version of the Best Management Practices Plan.

3. The Company shall record and retain such records, each time a specific preventative and control measure described in the Best Management Practices Plans is implemented. The Company shall record, as a minimum:

a. the date when each emission control measure is implemented, including a description of the control measure;

b. the date when each new preventative measure or operating procedure to minimize emissions is implemented, including a description of the preventative measure or operating procedure; and

c. the date, time of commencement, and time of completion of each periodic activity conducted to minimize emissions, including a description of the preventative measure/procedure and the name of the individual performing the periodic activity.

14. ODOUR ABATEMENT PLAN

1. The Company shall implement the currently approved Odour Abatement Plan. The Company shall implement operating procedures including inspection, maintenance and monitoring initiatives to prevent or minimize odour emissions from the Facility.

2. The Company shall submit to the District Manager, during the implementation of the Odour Abatement Plan, annual odour progress report in hard copy and electronic format by March 31 of each year which shall include at a minimum:

   a. applicable monitoring and assessment information for the previous year;

   b. status of implementation of the Odour Abatement Plan; and

   c. effectiveness/progress/results of the odour abatement measures implemented during the previous year.

15. COMMUNITY ENGAGEMENT

1. The Company shall continue to participate in a Community Liaison Committee (CLC). The objectives of the CLC shall include:

   a. keeping the community informed about the operations of the Facility in relation to the potential impacts on the community;

   b. keeping the Company informed of any community concerns about the operations of the Facility;

   c. to serve as a forum for the Company to disseminate and exchange information with the community related to operations of the Facility; and,

   d. to monitor the Company`s complaint response program and make recommendations to the Company with respect to this program.

2. The CLC shall not exercise any supervisory, regulatory, approval, legal or other decision making

role with respect to the operations of the Facility.

16. COMPLAINTS RECORDING AND REPORTING

1. If at any time, the Company receives an environmental complaint from the public regarding the operation of the Equipment approved by this Approval, the Company shall take the following steps:

    a. Record and number each complaint, either electronically or in a log book. The record shall include the following information: the time and date of the complaint and incident to which the complaint relates, the nature of the complaint, wind direction at the time and date of the incident to which the complaint relates and, if known, the address of the complainant.

    b. Notify the District Manager of the complaint within two (2) business days after the complaint is received, or in a manner acceptable to the District Manager.

    c. Initiate appropriate steps to determine all possible causes of the complaint, and take the necessary actions to appropriately deal with the cause of the subject matter of the complaint.

    d. Complete and retain on-site a report written within five (5) business days of the complaint date. The report shall list the actions taken to appropriately deal with the cause of the complaint and set out steps to be taken to avoid the recurrence of similar incidents.

17. RECORD KEEPING REQUIREMENTS

1. Any information requested by any employee in or agent of the Ministry concerning the Facility and its operation under this Approval, including, but not limited to, any records required to be kept by this Approval, shall be provided to the employee in or agent of the Ministry, upon request **,** in a timely manner.

2. Unless otherwise specified in this Approval, the Company shall retain, for a minimum of five (5) years from the date of their creation all reports, records and information described in this Approval, including,

    a. a copy of the Original ESDM Report and each updated version;

    b. a copy of each version of the Acoustic Assessment Report;

    c. supporting information used in the emission rate calculations performed in the ESDM Reports and Acoustic Assessment Reports;

    d. the records in the Log;

    e. copies of each Written Summary Form prepared under Condition 6.1 of this Approval;

f. records of maintenance, repair and inspection of Equipment related to all Processes with Significant Environmental Aspects;

g. all records related to environmental complaints made by the public as required by Condition 16 of this Approval;

h. records related to Source Testing events, as required by Condition 11 of this Approval;

i. records related to the operation of the CEM System and CPM System, as required by Condition 10 of this Approval;

j. records related to the preventative and control measures implemented, as required by Condition 13 of this Approval;

k. records related to sampling and analysis, as required by Conditions 8 and 9 of this Approval;

l. records related to the Odour Abatement Plan specified under Condition 14 of this Approval; and

m. records related to Carbon Dioxide Emission Intensity testing, as required by Condition 12 of this Approval.

18. COMPLIANCE REPORTING

1. 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 F 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 16 of this Approval.

2. The Company shall make the Annual Report available for examination by any person by posting it on a Company website and making it available without charge during regular business hours at the Facility, immediately after it is submitted to the Ministry.

19. ACOUSTIC AUDIT

1. The Company shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Company;

   a. shall carry out Acoustic Audit measurements in accordance with the procedures in Ministry Publication NPC-103; and,

   b. shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of Ministry Publication NPC-233, to the District Manager and the Director not later than six (6) months after the completion of the Noise Abatement Action Plan.

2. The Director;

   a. may not accept the results of the Acoustic Audit if the requirements of Ministry Publication NPC-233 were not followed; and,

   b. may require the Company to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

20. REVOCATION OF PREVIOUS APPROVALS

1. This Approval replaces and revokes all Certificates of Approval (Air) issued under section 9 EPA and Environmental Compliance Approvals issued under Part II.1 EPA to the Facility in regards to the activities mentioned in subsection 9(1) of the EPA and dated prior to the date of this Approval.

SCHEDULE A

Supporting Documentation

1. Environmental Compliance Approval Application, dated November 29, 2023, signed by Ruben Plaza and submitted by the Company;
2. Emission Summary and Dispersion Modelling Report, prepared by BCX Environmental Consulting and dated June 2024;
3. Carbon Dioxide Emission Intensity Report, Votorantim Cimentos North America - Prepared by Golder Associates Ltd., March 2022;
4. Alternative Low Carbon Fuel Use at St. Marys Cement St. Mary's Plant - Consultation Report - Prepared by Golder Associates Ltd., March 2022;
5. Alternative Low Carbon Fuel Handling Procedures and Testing Manual- St. Marys Cement Inc. (Canada) - St. Mary's Cement Plant, Version 1.0, March, 2022;
6. Acoustic Assessment Report prepared by Petr Chocensky of HGC Engineering and dated March 29, 2022.
7. Acoustic Assessment Report prepared by Petr Chocensky of HGC Engineering and dated June 2, 2023.
8. Acoustic Assessment Report prepared by Petr Chocensky of HGC Engineering and dated August 31, 2023.
9. Acoustic Assessment Report Addendum prepared by Petr Chocensky of HGC Engineering and dated June 27, 2024.

SCHEDULE B

PERFORMANCE REQUIREMENTS - IN-STACK EMISSION LIMITS

Parameter	Cement Kiln Stack Emission Limit	Verification of Compliance
Particulate Matter (PM)	50 mg/Rm^3	Results from compliance source testing
Cadmium (Cd)	7 µg/Rm3	Results from compliance source testing
Lead (Pb)	60 µg/Rm3	Results from compliance source testing
Mercury (Hg)	20 µg/Rm3	Results from compliance source testing
Dioxins and Furans	80 pg/Rm^3 as ITEQ	Results from compliance source testing; results expressed as I-TEQ.
Hydrochloric Acid (HCl)	27 mg/Rm^3	Results from compliance source testing

Notes:

- R : Reference flue gas conditions, defined as follows:
  - Temperature 25 °C
  - Pressure 101.3 kPa
  - Oxygen content 11%
  - Water content nil (dry conditions)
- mg/Rm3 : milligrams per cubic metre of gas at Reference conditions.
- µg/Rm3 : micrograms per cubic metre of gas at Reference conditions.
- pg/Rm3 : picograms per cubic metre of gas at Reference conditions.
- I-TEQ : a toxicity equivalent concentration calculated using the toxic equivalency factors (I-TEFs) derived for each dioxin and furan congener by comparing its toxicity to the toxicity of 2,3,7,8 tetrachloro dibenzo-p-dioxin, recommended by the World Health Organization (WHO) dioxin toxicity equivalence factors (TEFs) in 2005, and adopted by Ontario in April 2012.

SCHEDULE C

Emission Control Equipment Operational Requirements

1. **Process Dust Control Equipment Operational Requirements**
   The value of each of the following parameters must be referenced to the value recorded during previous source testing, if available. In the absence of source testing, each parameter must be referenced to the value or normal range representing normal operation, recorded as soon as possible for the Equipment.

   a. **Primary Equipment**
      Primary dust control equipment includes the Kiln Baghouse; Bypass Electrostatic Precipitator, Fuel Mill Baghouse; Clinker Cooler Baghouse and Finish Mill Baghouses.

      i. **Dust Collector**
         Operating parameters mean the following parameters of a fabric filter dust collector:
         1. the condition of the dust collector filter bags, the ducts leading to and from the dust collector and connecting the components of the dust collector;
         2. the static pressure drop across the dust collector filter bag compartments;
         3. the air reservoir pressure;
         4. the presence or absence of clean side deposits;
         5. the frequency of cleaning;
         6. the current of the induced draft fan(s); and
         7. the revolutions per minute of the induced draft fan(s).

      ii. **Electrostatic Precipitator**
         Operating Parameters means the following parameters of the electrostatic precipitator:
         1. the condition of the electrostatic precipitator, the ducts leading to and from the electrostatic precipitator, the ducts connecting the components of the electrostatic precipitator and the electrical system;
         2. the inlet temperature of the electrostatic precipitator;
         3. the secondary voltages and current of the electrostatic precipitator; and
         4. the presence or absence of clean side deposits in the electrostatic precipitator.

   b. **Secondary Equipment**
      Secondary dust control equipment includes all other dust collectors which are not primary dust control equipment.

      i. **Dust Collector**
         Operating parameters mean the following operating parameters of a fabric filter dust collector:
         1. the condition of the dust collector filter bags, the ducts leading to and from the dust collector and connecting the components of the dust collector;
         2. the static pressure drop across the dust collector filter bag compartments;
         3. the air reservoir pressure;
         4. the presence or absence of clean side deposits;
         5. the frequency of cleaning; and

6. the revolutions per minute of the induced draft fan(s).

2. Other Emission Control Equipment
Including but not limited to Selective Noncatalytic Reduction (SNCR) equipment.

SCHEDULE D

MATERIAL ANALYSIS CONTAMINANTS

1. Antimony
2. Arsenic
3. Barium
4. Beryllium
5. Cadmium
6. Chromium
7. Cobalt
8. Iron
9. Lead
10. Manganese
11. Mercury
12. Nickel
13. Selenium
14. Silver
15. Tin
16. Vanadium
17. Total Halogens

SCHEDULE E

Continuous Monitoring System Requirements

PARAMETER: Opacity

INSTALLATION:

The continuous opacity monitor shall be installed at an accessible location where the measurements are representative of the actual opacity of the gases leaving the flare and shall meet the following design and installation specifications.

PARAMETERS	SPECIFICATION
Wavelength at Peak Spectral Response (nanometres, nm)	500 to 600
Wavelength at Mean Spectral Response (nm)	500 to 600
Detector Angle of View	≤ 5 degrees
Angle of Projection	≤ 5 degrees
Range (percent of opacity)	0 to 100

PERFORMANCE:

The Continuous Opacity Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
Span Value (percent opacity)	2 times the average normal opacity of the source
Calibration Error	≤ 3 percent opacity
Attenuator Calibration	≤ 2 percent opacity
Response Time (95 percent response to a step change)	≤ 10 seconds
Schedule for Zero and Calibration Checks	daily minimum
Procedure for Zero and Calibration Checks	all system components checked
Zero Calibration Drift (24-hours)	≤ 2 percent opacity
Span Calibration Drift (24-hours)	≤ 2 percent opacity
Conditioning Test Period	≥ 168 hours without corrective maintenance
Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:

The monitor shall be calibrated, to ensure that it meets the drift limits specified above, during the periods of the operation of the Cement Kiln. The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:

The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 30 seconds or better.

RELIABILITY:

The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time each calendar quarter during the first full year of operation, and 95% thereafter.

SCHEDULE F

ALTERNATIVE LOW-CARBON FUELS OPERATIONAL REQUIREMENTS

Parameter	Limits	Measurement
Total Quantity of Alternative Low-Carbon Fuels combusted in the Cement Kiln.	175 tonnes per day	Measured continuously and summed daily.
Temperature in the Cement Kiln (**in order to commence introduction of ALCF's**)	**PRIMARY -** the temperature of the gas leaving the kiln reaches a minimum of 1000 Deg C; or **SECONDARY -** the temperature of the gases at Stage 4 of the preheater tower where the gas temperature reaches a minimum of 750 Deg C	Measured by the CPM System in the Burner Pipe infrared temperature probe or one of the Stage 4 temperature sensors (West or East) Calculated as a rolling 1-hour arithmetic average measured by the CPM System with a minimum combined uptime of 90%
Residual oxygen (**in order to commence introduction of ALCF's**)	The residual oxygen at Stage 1 of the preheater tower where the residual oxygen reaches a minmum of 1%	Measured by the CPM System in either the Stage 1 West or Stage 1 East sensor and calculated by volume on a dry basis in the undiluted gases leaving the preheater tower. Calculated as a rolling 1-hour arithmetic average measured by the CPM System with a minimum combined uptime of 90% for both Stage 1 sensors
Pressure Control (**in order to commence introduction of ALCF's**)	Kiln, Preheater tower and Raw Mill must be operated under negative pressure at all times.	Measured at the top of the preheater towers and in Raw Mill by continuous monitor. Calculated as a rolling 4-hour arithmetic average measured by the CPM System with a minimum uptime of 90%
Start-Up, Shut-down and Upset Operating Conditions	No Alternative Low-Carbon Fuels shall be used.	-

SCHEDULE G

PROCEDURE FOR SOURCE TESTING

1. The Company shall submit, not later than three (3) months prior to the Source Testing required under Conditions 11.1.a, 11.1.e, and 11.2.a of this Approval, a Pre-Test Plan for the Source Testing required under this Approval to the Manager and the Director. In addition to the required information, the Pre-Test plan shall also include information on the blend (s) of Alternative Low-Carbon Fuels and quantity proposed to be used for the Source Testing, along with details regarding the process for selection of the Alternative Low-Carbon Fuels blend (s) and quantity for Source Testing. The Company shall finalize the Pre-Test Plan in consultation with the Manager and the Director.

2. The Company shall not commence the Source Testing until the Manager has accepted the Pre-Test Plan.

3. For subsequent Source Testing under Condition 11.1.c of this Approval:

    1. The Company shall submit either a written notification of intent to use a previously approved Pre-Test Plan (with version reference if there were more than one (1) previously approved Pre-Test Plan), or a new Pre-Test Plan, to the Manager and Director not later than three (3) months of the planned date of the Source Testing for approval. The written notification or the new Pre-Test Plan shall also include information on the blend (s) of Alternative Low-Carbon Fuel and the quantity proposed to be used for the Source Testing, along with details regarding the process for selection of the blend (s) for Source Testing for its finalization in consultation with the Manager and the Director.

    2. If the Company submitted a written notification of intent to use a previously approved Pre-Test Plan, the Manager may either accept the use of a previously approved Pre-Test Plan, or request the submission of a new Pre-Test Plan for approval. The Company shall submit the requested new Pre-Test Plan within two (2) months after the Manager requested the submission.

    3. The Company shall complete the subsequent Source Testing no later than three (3) months after the Manager has either agreed with the written notification or approved the new Pre-Test Plan.

4. The Company shall notify the District Manager, the Manager and the Director in writing of the location, date and time of any impending Source Testing required by this Approval, at least fifteen (15) days prior to the Source Testing.

5. The Company shall submit a report (hardcopy and electronic format) on the Source Testing to the Manager and the District Manager not later than four (4) months after completing the Source Testing, or not later than a time frame agreed in writing with the Manager. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

    1. an executive summary;
    2. results of Source Testing, including the emission rate, emission concentration and relevant emission factor of the Test Contaminants;

3. records of operating conditions at the time of Source Testing and other information including but not limited to:

    a. an executive summary
    b. a summary of the results of the fuel analysis program specified in Condition 8.9 of this Approval;
    c. a summary of records specified in condition 8.11 of this Approval and records of operating conditions at the time of Source Testing, including but not limited to:
        i. Clinker production rate in tonnes/hour
        ii. Conventional Fuels fired in the Cement Kiln in tonnes/hour
        iii. Each category of the Alternative Low-Carbon Fuels described in condition 7.1 of the Approval fired in the Cement Kiln in tonnes/day;
        iv. Fuel Adjunct Material and Industrial By-Product Material input into the Cement Kiln in tonnes/day;
    d. any other records that may affect the Source Testing results.

4. A summary of all records of the CEM System and CPM System for the parameters specified in Condition 10 of this Approval at the time of Source Testing;

5. A summary table that compares the Source Testing results to the emission estimates described in the Company's application, the ESDM Report and the Performance Limits;

6. The Director may not accept the results of the Source Testing if:

    1. the Source Testing Code or the requirements of the Manager were not followed;
    2. the Company did not notify the District Manager, the Manager and the Director of the Source Testing; or
    3. the Company failed to provide a complete report on the Source Testing.

7. If the Director does not accept the results of the Source Testing, the Director may require re-testing. If re-testing is required, the Pre-Test Plan strategies need to be revised and submitted to the Manager for approval. The actions taken to minimize the possibility of the Source Testing results not being accepted by the Director must be noted in the revision.

8. If the Source Testing results are higher than the emission estimates in the Company's ESDM Report, the Company shall update their ESDM Report in accordance with Section 26 of O. Reg. 419/05 with the results from the Source Testing report and make these records available for review by staff of the Ministry upon request. The updated Emission Summary Table from the updated ESDM Report shall be submitted with the report on the Source Testing.

9. The Company shall ensure that the above mentioned Source Testing report is made available and easily accessible for review by the public at the Facility immediately after the document is submitted to the Ministry.

SCHEDULE H

TEST CONTAMINANTS AND SOURCES

TEST SOURCES: Cement Kiln Stack

TEST CONTAMINANTS

- Total Suspended Particulate Matter
- Hydrogen Chloride
- Ammonia
- Carbon Monoxide (CO)

List of Metals:

- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Mercury
- Manganese
- Molybdenum
- Nickel
- Selenium
- Silver
- Thallium
- Vanadium
- Zinc

SCHEDULE H

Volatile Organic Matter	List of Polycyclic Organic Matter
• Acetaldehyde • Acetone • Acrolein • Benzene • Bromodichloromethane • Bromoform • Bromomethane • Butadiene, 1,3 - • Butanone, 2 - • Carbon Tetrachloride • Chloroform • Cumene • Dibromochloromethane • Dichlorodifluoromethane • Dichloroethane, 1,2 - • Dichloroethene, Trans - 1,2 • Dichloroethene, 1,1 - • Dichloropropane, 1,2 - • Ethylbenzene • Ethylene Dibromide • Mesitylene • Methanol • Methylene Chloride • Phenol • Propionaldehyde • Styrene • Tetrachloroethene • Toluene • Trichloroethane, 1,1,1 - • Trichloroethene • Trichloroethylene, 1,1,2 - • Trichlorotrifluoroethane • Trichlorofluoromethane • Xylenes, M-, P- and O • Vinyl Chloride	• Acenaphthylene • Acenaphthene • Anthracene • Benzo(a)anthracene • Benzo(b)fluoranthene • Benzo(k)fluoranthene • Benzo(a)fluorene • Benzo(b)fluorene • Benzo(ghi)perylene • Benzo(a)pyrene • Benzo(e)pyrene • 2-Chloronaphthalene • Chrysene • Coronene • Dibenzo(a,c)anthracene • 9,10-Dimethylanthracene • 7,12-Dimethylbenzo(a)anthracene • Fluoranthene • Fluorene • Indeno(1,2,3-cd)pyrene • 2-Methylanthracene • 3-Methylcholanthrene • 1-Methylnaphthalene • 2-Methylnaphthalene • 1-Methylphenanthrene • 9-Methylphenanthrene • Naphthalene • Perylene • Phenanthrene • Picene • Pyrene • Tetralin • Triphenylene

SCHEDULE H

Dioxins, Furans and Dioxin-like PCBs (Polychlorinated Biphenyls)

Toxicity equivalency factors (TEFs) are applied to 29 isomers of dioxins, furans and dioxin-like PCBs to convert them into 2,3,7,8-CDD (tetrachlorodibenzo-p-dioxin) toxicity equivalents (TEQ). The conversion involves multiplying the concentration of each isomer by the appropriate TEF to yield the TEQ for this isomer. Summing the individual TEQ values for each of the isomers provides the total toxicity equivalent level for the sample mixture.

A table listing the isomers and their TEFs can be found in the Ministry publication titled "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", as amended from time to time.

No.	Dioxins, Furans, and Dioxin-like PCBs	CASRN	WHO_{2005} Toxic Equivalency Factors [TEFs]
1	2,3,7,8-Tetrachlorodibenzo-p-dioxin [2,3,7,8-TCDD]	1746-01-6	1
2	1,2,3,7,8-Pentachlorodibenzo-p-dioxin [1,2,3,7,8-PeCDD]	40321-76-4	1
3	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin [1,2,3,4,7,8-HxCDD]	39227-28-6	0.1
4	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin [1,2,3,6,7,8-HxCDD]	57653-85-7	0.1
5	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin [1,2,3,7,8,9-HxCDD]	19408-74-3	0.1
6	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin [1,2,3,4,6,7,8-HpCDD]	35822-46-9	0.01
7	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin [1,2,3,4,6,7,8,9-OCDD]	3268-87-9	0.0003
8	2,3,7,8-Tetrachlorodibenzofuran [2,3,7,8-TCDF]	51207-31-9	0.1
9	1,2,3,7,8-Pentachlorodibenzofuran [1,2,3,7,8-PeCDF]	57117-41-6	0.03
10	2,3,4,7,8-Pentachlorodibenzofuran [2,3,4,7,8-PeCDF]	57117-31-4	0.3
11	1,2,3,4,7,8-Hexachlorodibenzofuran [1,2,3,4,7,8-HxCDF]	70648-26-9	0.1
12	1,2,3,6,7,8-Hexachlorodibenzofuran [1,2,3,6,7,8-HxCDF]	57117-44-9	0.1
13	1,2,3,7,8,9-Hexachlorodibenzofuran [1,2,3,7,8,9-HxCDF]	72918-21-9	0.1

SCHEDULE H

No.	Dioxins, Furans, and Dioxin-like PCBs	CASRN	WHO_{2005} Toxic Equivalency Factors [TEFs]
14	2,3,4,6,7,8-Hexachlorodibenzofuran [2,3,4,6,7,8-HxCDF]	60851-34-5	0.1
15	1,2,3,4,6,7,8-Heptachlorodibenzofuran [1,2,3,4,6,7,8-HpCDF]	67562-39-4	0.01
16	1,2,3,4,7,8,9-Heptachlorodibenzofuran [1,2,3,4,7,8,9-HpCDF]	55673-89-7	0.01
17	1,2,3,4,6,7,8,9-Octachlorodibenzofuran [1,2,3,4,6,7,8,9-OCDF]	39001-02-0	0.0003
18	3,3',4,4'-Tetrachlorobiphenyl [3,3',4,4'-tetraCB (PCB 77)]	32598-13-3	0.0001
19	3,4,4',5- Tetrachlorobiphenyl [3,4,4',5-tetraCB (PCB 81)]	70362-50-4	0.0003
20	3,3',4,4',5- Pentachlorobiphenyl (PCB 126) [3,3',4,4',5-pentaCB (PCB 126)]	57465-28-8	0.1
21	3,3',4,4',5,5'- Hexachlorobiphenyl [3,3',4,4',5,5'-hexaCB (PCB 169)]	32774-16-6	0.03
22	2,3,3',4,4'- Pentachlorobiphenyl [2,3,3',4,4'-pentaCB (PCB 105)]	32598-14-4	0.00003
23	2,3,4,4',5- Pentachlorobiphenyl [2,3,4,4',5-pentaCB (PCB 114)]	74472-37-0	0.00003
24	2,3',4,4',5- Pentachlorobiphenyl [2,3',4,4',5-pentaCB (PCB 118)]	31508-00-6	0.00003
25	2',3,4,4',5- Pentachlorobiphenyl [2',3,4,4',5-pentaCB (PCB 123)]	65510-44-3	0.00003
26	2,3,3',4,4',5- Hexachlorobiphenyl [2,3,3',4,4',5-hexaCB (PCB 156)]	38380-08-4	0.00003
27	2,3,3',4,4',5'- Hexachlorobiphenyl [2,3,3',4,4',5'-hexaCB (PCB 157)]	69782-90-7	0.00003
28	2,3',4,4',5,5'- Hexachlorobiphenyl [2,3',4,4',5,5'-hexaCB (PCB 167)]	52663-72-6	0.00003
29	2,3,3',4,4',5,5'- Heptachlorobiphenyl [2,3,3',4,4',5,5'-heptaCB (PCB 189)]	39635-31-9	0.00003

SCHEDULE H

NOTE:

The TEF scheme is intended to be used with isomer specific analytical results. In cases where results are reported by congener group only, staff at Ministry's Technical Assessment and Standards Development Branch shall be contacted for appropriate procedures to convert non-isomer specific data to TEQs.

The reasons for the imposition of these terms and conditions are as follows:

1. **GENERAL**
   Condition No. 1 is included to require the Approval holder to build, operate and maintain the Facility in accordance with the Supporting Documentation in Schedule A considered by the Director in issuing this Approval.

2. **LIMITED OPERATIONAL FLEXIBILITY, REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION AND PERFORMANCE LIMITS**
   Conditions No. 2, 3 and 4 are included to limit and define the Modifications permitted by this Approval, and to set out the circumstances in which the Company shall request approval of an Acceptable Point of Impingement Concentration prior to making Modifications. The holder of the Approval is approved for operational flexibility for the Facility that is consistent with the description of the operations included with the application up to the Facility Production Limit. In return for the operational flexibility, the Approval places performance based limits that cannot be exceeded under the terms of this Approval. Approval holders will still have to obtain other relevant approvals required to operate the Facility, including requirements under other environmental legislation such as the Environmental Assessment Act.

3. **DOCUMENTATION REQUIREMENTS**
   Condition No. 5 is included to require the Company to maintain ongoing documentation that demonstrates compliance with the performance limits as specified in Condition 4 of this Approval and allows the Ministry to monitor on-going compliance with these performance limits. The Company is required to have an up to date ESDM Report and Acoustic Assessment Report that describe the Facility at all times and make the Emission Summary Table and Acoustic Assessment Summary Table from these reports available to the public on an ongoing basis in order to maintain public communication with regard to the emissions from the Facility.

4. **WRITTEN SUMMARY FORM**
   Condition No. 6 is included to require the Company to provide a yearly Written Summary Form to the Ministry, to assist the Ministry with the review of the site's compliance with the EPA, the regulations and this Approval.

5. **APPROVED ALTERNATIVE LOW-CARBON FUELS**
   Condition No. 7 is included to define Alternative Low-Carbon Fuels in this Approval.

6. OPERATION AND MAINTENANCE

Condition No. 8 is included to require the Company to properly operate and maintain the Processes with Significant Environmental Aspects to minimize the impact to the environment from these processes.

7. MONITORING AND TESTING

Condition Nos. 9, 10, 11 and 12 are included to require the Company to gather and retain accurate information so that compliance with the EPA, O. Reg. 419/05, O. Reg. 79/15 and this Approval may be verified.

8. FUGITIVE EMISSIONS CONTROL AND ODOUR ABATEMENT PLAN

Condition Nos. 13 and 14 are included to emphasize that the Equipment and Facility must be maintained and operated in accordance with a procedure that will result in compliance with the EPA, Regulation 419/05 and this Approval and to require the Company to keep records and to provide information to staff of the Ministry so that compliance with the EPA, Regulation 419/05 and this Approval may be verified.

9. COMMUNITY ENGAGEMENT

Condition No. 15 is included to require the Company to involve and inform the public on the environmental performance of the Facility.

10. COMPLAINTS RECORDING AND REPORTING

Condition No. 16 is included to require the Company to respond to any environmental complaints regarding the operation of the Equipment, according to a procedure that includes methods for preventing recurrence of similar incidents and a requirement to prepare and retain a written report.

11. RECORD KEEPING REQUIREMENTS

Condition No. 17 is included to require the Company to retain all documentation related to this Approval and provide access to employees in or agents of the Ministry, upon request, so that the Ministry can determine if a more detailed review of compliance with the Performance Limits as specified in Condition 4 of this Approval is necessary.

12. COMPLIANCE REPORTING

Condition No. 18 is included to require the Company to provide an Annual Report to the Ministry and the public, to assist the Ministry with the review of the site's compliance with the EPA, the regulations and this Approval and to ensure that the public has access to information on the environmental impacts of the Facility.

13. ACOUSTIC AUDIT

Condition No. 19 is included to require the Company to gather accurate information and submit an Acoustic Audit Report in accordance with procedures set in the Ministry's noise guidelines, so that the environmental impact and subsequent compliance with this Approval can be verified.

14. REVOCATION OF PREVIOUS APPROVALS

Condition No. 20 is included to identify that this Approval replaces all Section 9 Certificate(s) of Approval and Part II.1 Approvals in regards to the activities mentioned in subsection 9(1) of the EPA and dated prior to the date of this Approval.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 0706-CLVLC2 issued on August 17, 2023

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the *Environmental Protection Act* provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the *Environmental Protection Act,* a hearing may not be available with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Director appointed for the purposes of Part II.1 of the *Environmental Protection Act*
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act.*

DATED AT TORONTO this 11th day of November, 2024

Nancy Onyana

Nancy E Orpana, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

AB/

c: District Manager, MECP London - District
Kate Liubansky, WSP Canada Inc.